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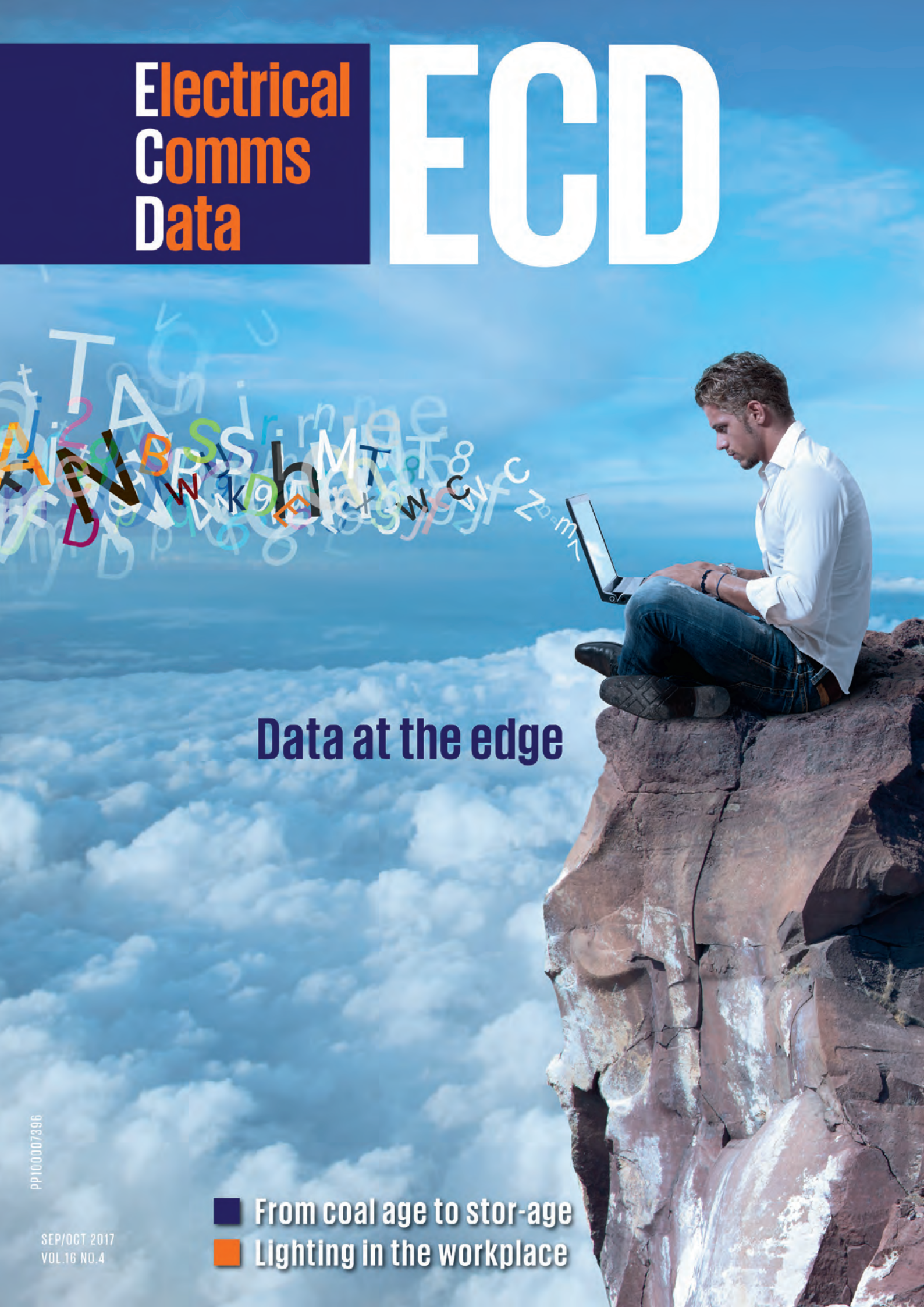
ECD



Data at the edge

- From coal age to stor-age
- Lighting in the workplace

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VOL.16 NO.4

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CONTENTS

FROM THE EDITOR

As this issue of ***ECD*** went to press, the debate around the draft battery storage standard continued.Standards Australia concluded public consultation on the draft battery storage standard around mid-August, receiving over 3000 comments. Many related to "how systems should be installed in a residential context". Given the volume of response, the standards body offered to bring key stakeholders together to start a discussion and establish a framework through which these public policy tensions can be addressed.

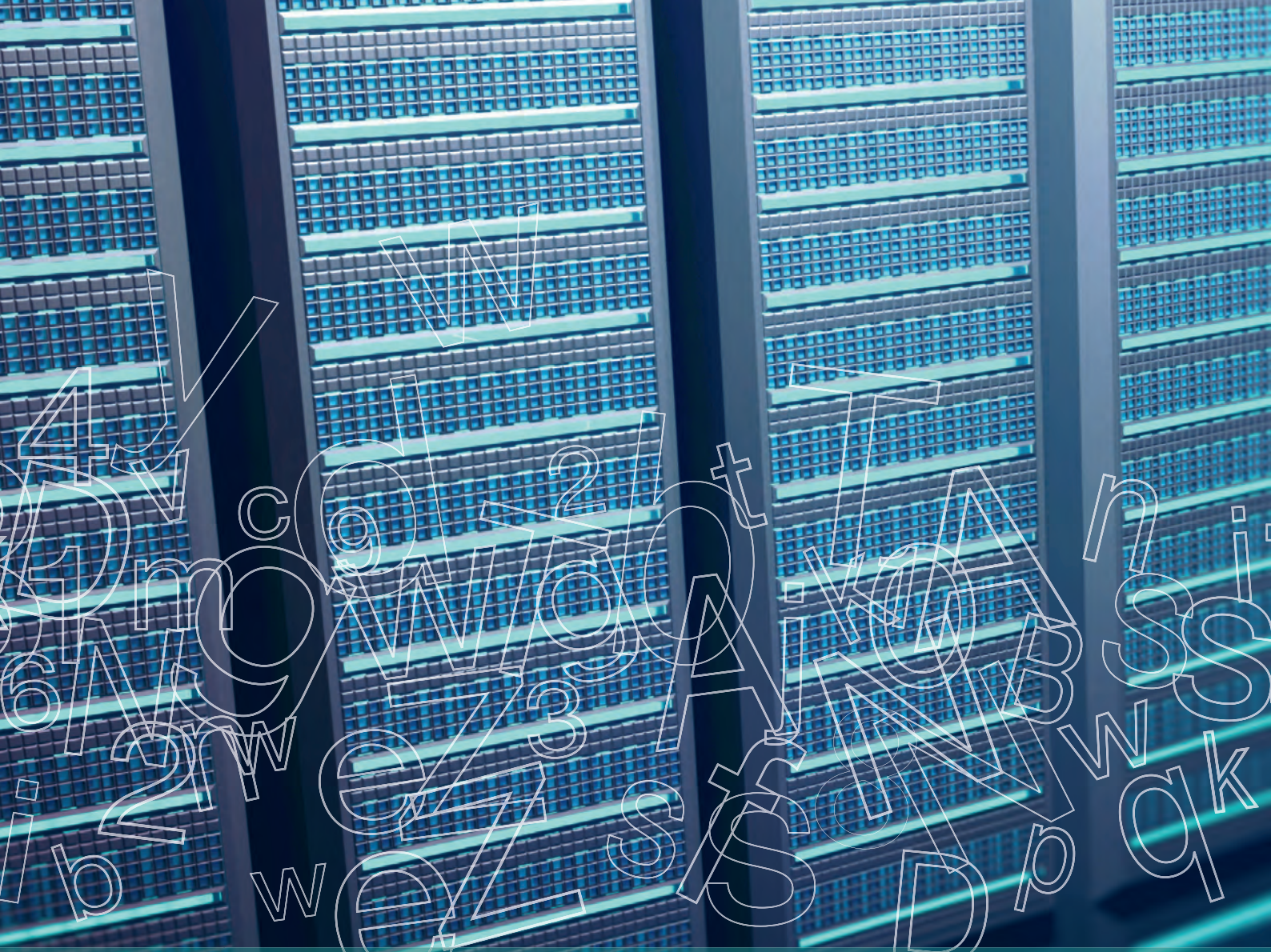
The energy storage industry is calling for changes to a draft technical standard that requires energy storage units to be installed outside the home. The CEC's Executive General Manager of Installation Integrity Sandy Atkins said as long as home energy storage units meet strong international standards and are installed by an accredited professional, housing home battery units outside is unnecessarily restrictive.

While the standards development continues, the Clean Energy Council has updated its installation guidelines for home storage units to ensure installers are aware of the requirements. The Council is also working with electrical regulators and industry representatives towards the rapid implementation of an industry guide on battery product standards.

The Electrical Trades Union is concerned that without an appropriate standard in place the fast-growing technology could pose significant dangers, especially if installation was attempted by people without the proper training. While we appreciate that there are some technical elements on which there is legitimate disagreement, we want to see a baseline established in terms of who is allowed to perform installation work, and how the work is expected to be performed, said Electrical Trades Union National Secretary Allen Hicks.

Best regards,

Mansi Gandhi – Editor
ecd@wfmedia.com.au



DATA AT THE EDGE

Robert Linsdell, Managing Director Australia and New Zealand, Vertiv

Businesses in Australia and New Zealand are changing the way they design their data centres. Therefore, it's crucial for electrical and cooling professionals to be across the changes in technology.

Public cloud continues to grow, as do innovations in on-premise data centres, such as hyperconverged infrastructure. But there's a new kid on the block disrupting the lot — the modular or 'edge' data centre.

The edge is hot — by edge, I mean the edge of the network, the mobile devices that organisations now find integral to their day-to-day business; and by hot, I mean more and more data is being created here, at the edge, than ever before.

Enter modular data centres. Businesses across different industries are fast deploying compact, plug-and-play data centres to branch or regional offices to manage the needs for on-site compute and networking or cloud based on premises, largely thanks to the modern mobile nature of working, concerns of data sovereignty and security of data considered too confidential for cloud.

The benefits are many — if you can process data closer to where it's produced, it reduces latency for time-sensitive applications and eases the constantly increasing bandwidth required to transit back to the cloud or core data centre. This means a better, more reliable user experience at the edge, and no need for large amounts of data to be hauled back to the data centre.

Cloud and co-location providers have observed this change and responded; businesses overseas have begun to establish an array of small to medium-sized modular data centres. In some cases, cloud providers have crafted offerings to arrange their on-premises cloud stack to be housed in enterprise data centres.

Cloud providers know that these data centres can enable customers to build out their 'blast radius' — lowering the latency between operating nodes to give them faster access to data. Similarly, co-location providers can host edge applications for enterprise businesses. Both are striving for an enhanced user experience, whether the user is developing a new digital service for another department, processing financial transactions or scanning Reddit for the latest *Game of Thrones* theories.

The trend towards edge data centres is global, and Australia is no exception. Last year, Frost & Sullivan predicted that modular data centres would play a big part in the wider 'data centre services market', set to grow at 12.4% compound annual growth rate (CAGR) until 2022, hitting revenues of more than AU$2 billion by 2021.

By their very nature, modular data centres are packed with carefully engineered electrical and cooling components, meaning there are huge opportunities for professionals in these areas who want to avail themselves of the opportunities in this market.

Edging out costs

Aside from faster access to information, edge data centres help to keep operational costs low, making them more affordable options for customers.

These savings multiply as organisations invest in this infrastructure for more and more locations, as cooling costs, downtime and operational visibility through remote monitoring across the network increase. The designs have low power usage effectiveness (PUE) — sub 1.5 — to ensure minimal energy consumption and environmental impact. Designs also look at the ability to expand and contract within the structure, and also expand and contract as a structure.

Essentially, these devices give power back to customers to manage their own environment with little fuss. Everything from access control to power utilisation monitoring, temperature monitoring and inventory management is all controlled under the same umbrella.

At Vertiv, we ran a survey among IT, data centre and facilities professionals, which indicated cooling capacity, service and maintenance are top concerns. It also showed that the remote locations at which these data centres are most likely to be deployed tend to lack dedicated IT personnel, so central monitoring over regional data centres is incredibly valuable.

> IF EXTRA CAPACITY IS NEEDED, EDGE DATA CENTRES CAN ADD IT THROUGH A SCALABLE, MODULAR DESIGN WITH NO NEED FOR EXTRA CHILLERS, COOLING TOWERS OR EVEN DUCTWORK.

Keeping data centres cool

Getting cooling right helps reduce costs, speed and time to market, and mitigate downtime risks, and herein lies opportunities for those who can provide new approaches to cooling within edge data centres. The challenge on the edge is what technology to use and whether it meets business requirements (chilled water, direct expansion, evaporative cooling, etc). The ease of deployment and maintenance also come into consideration, particularly in non-metropolitan areas.

Direct expansion systems certainly allow for ease of deployment and also provide relatively simple and well-known installation and ongoing maintenance practices. One of the challenges in the past has been incorporating energy efficiency into these systems. However, the introduction of variable cooling capacity has helped enable this.

Going to the next level, modern design and newer architectures have enabled refrigerant economisation systems that further drive PUE efficiency with no involvement of water. This depends on the location and application of the edge data centre, but it can mean further energy savings of up to 50% with mechanical PUEs below 1.1, helping to both reduce costs and achieve efficiency goals. Another key area is being able to utilise lower outside ambient temperatures when available.

If the system can optimise operation for outdoor ambient temperatures as they change, IT loads can take advantage of 100% of the potential economisation hours. This ensures maximum efficiency — as needed, the system can turn off one or even both of its unit compressors, instead engaging the refrigerant pump, which operates at just 5% of the energy used by the compressors.

Built into these systems is a supervisory control system that contains no single point of failure and one single point of management for all cooling infrastructure. That means fast access to actionable data, system diagnostics and trending conditions.

The removal of points of failure, such as water piping systems, naturally improves reliability. If extra capacity is needed, edge data centres can add it through a scalable, modular design with no need for extra chillers, cooling towers or even ductwork. The need for regular manual adjustments involving water and outside air are also eliminated as everything is automated.

Monitoring in these systems can be done through simple mobile applications, which provide IT managers with remote visibility into thermal conditions inside small edge spaces. Some apps can even allow managers to track technician workflows and remotely control units when behind secure firewalls. This speeds up recovery while significantly reducing downtime. It also reduces the need for on-site service calls, the costs for which can increase quickly, and provides the opportunity for predictive maintenance.

Looking over the edge

Realistically, we're still at the beginning of the phenomenon we call the edge, and what it means for how the data centre market will change in the future. As the proliferation of IoT devices continues, and the demand for data and speed increase, we may start to see more remote and even smaller edge computing spaces develop over time. Moore's Law has yet to be proven wrong. Anticipating this is part one of the equation — realising and capitalising on the opportunity for electrical and cooling professionals will see it through.

Robert Linsdell will be talking about opportunities around the edge of the network at the Gartner Symposium/ITxpo 2017, being held on the Gold Coast from 30 October–2 November 2017.

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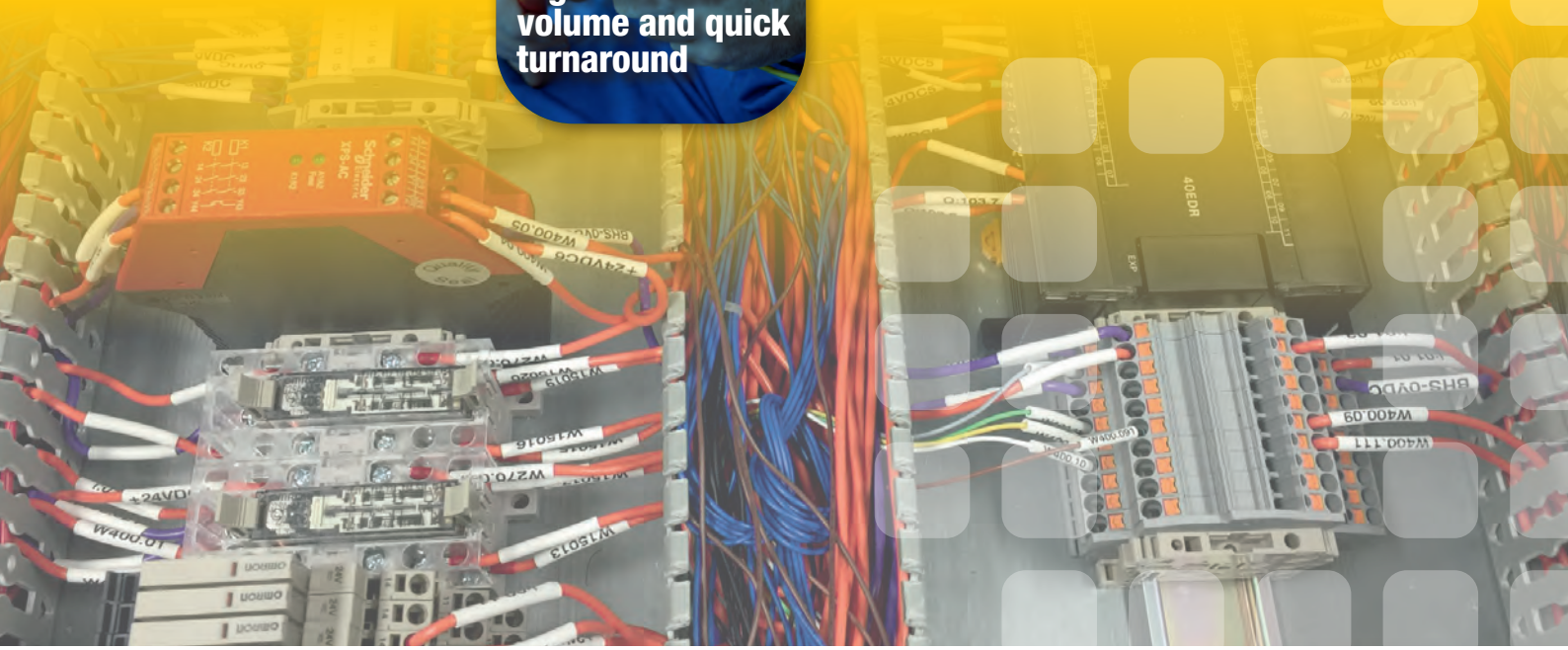

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Electrical Comms Data news

SWITCHBOARD SAFETY — UNDERSTAND THE RISKS

Queensland's Electrical Safety Office is reminding electrical workers to carry out a risk assessment before removing switchboard panels. If workers identify any hazards, they must put control measures in place to address the risk of electric shock, explosion or fire.

Electrical workers have been injured when they have removed switchboard escutcheon panels from an energised switchboard. As they have removed panels, electrical cables in the switchboard have become dislodged, resulting in an arc flash and causing severe burns.

Electrical safety laws prohibit work on energised electrical equipment unless:

- it is necessary in the interests of health and safety that the electrical work is carried out while the equipment is energised (for example, it may be necessary for lifesaving equipment to remain energised and operating while electrical work is carried out on the equipment)
- it is necessary that the electrical equipment to be worked on is energised in order for the work to be carried out properly
- it is necessary for the purposes of testing to ensure the equipment is de-energised
- there is no reasonable alternative means of carrying out the work.

Electrical workers must never work on energised electrical equipment just because it is more convenient. The Electrical Safety Office is reminding workers to consider their environment and the nature of work they are performing. If working with a high fault level, workers must consider putting the highest measures of controls in place — which would be to eliminate the hazard altogether and de-energise the switchboard.

If workers were working on a switchboard supplied by a 500 kVA transformer, the fault level would be near 14,000 A, which could result in an arc flash with temperatures of 19,400°C. In this circumstance the risks of working near the live parts can be just as dangerous as the live work itself, and you should de-energise the switchboard before starting work.

ELECTRICAL INDUSTRY ALERT — WIRING SPLIT SYSTEM AIR CONDITIONERS

Energy Safe Victoria, an independent technical regulator for electricity, gas and pipeline safety in Victoria, has published an alert relating to wiring split system air conditioners.

The alert has been issued following a technical issue with the installation of wiring between the outside unit (compressor) and the (head) indoor unit on various split system air conditioners.

The technical issue is with the interconnecting cable terminals of both the indoor and outdoor units; these terminals are labelled S1, S2 and S3 but are also distinguished by use of colour:

Terminal	Colour	Technical issue
S1	Black	Connects directly to the incoming active conductor (L ~)
S2	White	Connects directly to the incoming neutral conductor (N ~)
S3	Red	Red communication — no issue

Electricians are incorrectly connecting the wiring installed between the indoor and outdoor units to the terminal colour coding, resulting in the black conductor becoming an active conductor, the white conductor becoming a neutral conductor and the red conductor being communication.

The wiring installed between the outside unit and the indoor unit is classified as installation wiring and shall comply with the conductor insulation colours as specified in Table 3.4 of AS/NZS 3000:2007.

Should an electrician encounter this situation, immediate rectification is required, said Energy Safe Victoria in the alert.

NEW FINES FOR SAFETY BREACHES AROUND POWERLINES

The Queensland government has introduced two new on-the-spot fines to make sure employers take steps to keep workers safe around powerlines. The move follows nine serious electrical incidents in the past 12 months.

To improve safety, the Queensland government has amended the State Penalties and Enforcement Regulation 2014 to include two new infringement notices for working near overhead or underground powerlines. Government inspectors can now issue on-the-spot fines of up to $3000 to businesses who fail to identify risks and implement appropriate control measures.

The Electrical Safety Office has worked cooperatively with Energy Queensland to produce industry-specific guidance materials. These guides practically assist employers in developing safe systems of work, educating their workers and contractors and, importantly, keeping workers and any equipment they are using outside the exclusion zone.

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Electrical Comms Data news

NEW STREET LIGHTING GUIDELINES RELEASED

The Institute of Public Works Engineering Australasia (IPWEA) has released two new street lighting guidelines — the Model LED Public Lighting Specification and its companion, the Model Public Lighting Controls Specification.

IPWEA CEO Robert Fuller said the model specifications will remove the uncertainty around street lighting procurement, which has resulted in impediments, inefficiencies and cost overruns from poorly drafted and often technically inconsistent specifications.

"These new specifications will be a game changer for accelerating the rollout of LED ligvhting and smart controls across Australia and New Zealand, helping all parties successfully navigate the maze of new lighting technology," Fuller said.

IPWEA modelling shows that if every streetlight in Australia and New Zealand were converted to LEDs, councils would slash $120 million off their annual street lighting bills. However, the features that provide these benefits also add complexity to the specification and procurement process, making the process difficult for all parties involved. Currently, only 10% of Australia and New Zealand's streetlights have been converted to LEDs.

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Fuller said, "Early LED specifications often resulted in inefficient procurement processes that were costly for suppliers to respond to, raised the risks of inappropriate or poorly performing outcomes for buyers, and often resulted in less-than-fit-for-purpose outcomes.

"Overall, this inefficient process has impeded the timely uptake of LEDs and controls for public lighting despite the many demonstrated advantages they provide."

The model specifications provide an informative, structured template that is focused on the technical aspects for local governments, main road authorities and electricity distribution utilities, allowing them to prepare their own customised specifications within a structured public tender.

There has been exhaustive Australian and international input into the specifications to ensure they reflect industry best practice. "The peer review of the specifications has been so overwhelmingly positive that we have already had requests to trial these on projects in Europe," Fuller said.

The model specifications are part of the Street Lighting and Smart Controls (SLSC) Programme, which has been funded by the Department of the Environment and Energy to improve energy, environmental, economic and social outcomes.

The specifications can be downloaded from the SLSC website (www.slsc.org.au or www.slsc.org.nz) and are being supported by free industry webinars.

INDUSTRIAL MANSLAUGHTER OFFENCE IN QLD

The Palaszczuk Government has introduced legislative changes to create a new offence of industrial manslaughter in Queensland.

Industrial Relations Minister Grace Grace said the creation of the new offence was one of 58 recommendations contained in Tim Lyons' 'Best Practice Review of Workplace Health and Safety Queensland', released 22 August.

"Under our proposed laws, the maximum penalty for industrial manslaughter will be 20 years imprisonment for an individual, with a maximum fine of $10 million for a corporate offender," said Grace.

"Importantly, companies won't be able to hide behind elaborate corporate structures to evade their responsibilities."

Grace said the Work Health and Safety and Other Legislation Amendment Bill seeks to implement the 58 recommendations in the Best Practice Review.

"Most of the recommendations relate to operational improvements for Workplace Health and Safety Queensland or the WHS board," she said.

"However, a number of these recommendations need legislative changes to the Work Health and Safety Act, the Electrical Safety Act and the Safety in Recreational Water Activities Act.

"In line with the review's recommendation, the government will be increasing public protection by introducing new maintenance, operation and competency requirements for the inspection and operation of amusement devices.

"This will include an obligation to prepare a safety case and the application of a licensing regime.

"We will now begin working with industry to implement new arrangements, which will be phased in, commencing with the large theme parks from 1 December 2017."

Grace said changes under the Bill would ensure greater independence and transparency of the industrial prosecutions process in Queensland by providing the QIRC with additional powers, and establishing an independent statutory office for work health and safety prosecutions.

For a copy of the final report Best Practice Review of Workplace Health and Safety Queensland, visit worksafe.qld.gov.au.

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EEaSSy as...

Dannielle Furness

All electrical equipment offered for sale in Australia and New Zealand is required to meet a range of essential safety criteria under Electrical Equipment Safety System (EESS) regulations.

The system aims to provide consistent legislation throughout ANZ, to provide greater consumer safety and to mitigate the likelihood of exposure to electrical hazards, specifically in domestic environments.

EESS is based on harmonised electrical safety legislation, uniform equipment safety rules, ANZ standards and international standards. It is overseen by the Electrical Regulatory Authorities Council (ERAC). ERAC undertakes regular market monitoring via an audit and inspection process to ensure the compliance framework is maintained and to ensure unsafe equipment is not available for sale.

Equipment definitions

Under the scheme, in-scope equipment is defined as follows:

- Rated at greater than 50 VAC RMS or 120 V ripple-free DC (extra-low voltage).
- Rated at less than 1000 VAC RMS or 1500 V ripple-free DC (high voltage).
- Designed or marketed as suitable for household, personal or similar use.

In-scope equipment must meet with varying requirements, as deemed proportionate to the identified electrical hazard risk level associated with that equipment. Equipment falls into one of three categories: Level 3 (high risk), Level 2 (medium risk) and Level 1 (all other in-scope product).

To determine the appropriate risk level, the Australian and New Zealand Standards committee (QR-12) employs a Risk Engine, or risk calculator. The engine methodology has been assessed and validated by the Mathematical and Geospatial Sciences department at the Royal Melbourne Institute of Technology. The committee — made up of electrical industry experts spanning both government and the private sector — employs the calculator to assess risk levels, which are then recorded in AS/NZS 4417.2:2012.

The regulations governing the sale of high-risk Level 3 products are more stringent than for those classified under Level 1 and Level 2. Product risk classification is shown in Annex B Table B.4 of AS/NZS 4417:2. The most recent amendment of the standard (February 2017) includes the introduction of building wire into the Level 3 risk category in Australia. An overview of applicable products under Level 3 follows and a full list is available in the most recent release of the standard.

- Lighting, electrical accessories and components including: Any flexible supply cord that is unscreened and designed for use at low voltage that: consists of two or three elastomer or PVC insulated cores of multistrand construction, has a cross-sectional

> THE EESS NATIONAL DATABASE IS A PUBLICLY ACCESSIBLE REPOSITORY FOR PRODUCT AND SUPPLIER INFORMATION AS OUTLINED UNDER THE SCHEME.

area of each conductor not exceeding 2.5 mm^2, has (other than tinsel cords) individual wire strandings not exceeding 0.21 mm for conductor sizes up to 1 mm^2 or 0.26 mm for conductor sizes exceeding 1 mm^2. This excludes flexible cord directly connected to equipment or approved non-rewirable accessories (B.2.47).

- Building wire cable that: has 1 to 5 conductors of stranded or solid cores of copper conductors; has an insulated and laid up flat or circular configuration; is sheathed or unsheathed insulated cable; is intended for use at a rated voltage of between 200 and 250 V single phase, or between 350 and 450 V multi-phase, RMS AC, between conductors or to earth; is intended for use in buildings or similar structures; and has a nominal cross-sectional area per conductor from 0.5 to 16 mm^2. This excludes armoured, metallic screened and metal sheathed cables (B.2.59).
- Appliance connectors.
- Lampholders and adaptors.
- Fluorescent lamp ballasts and starters.
- Portable luminaires and decorative lighting.
- Miniature overcurrent circuit breakers.
- Outlet devices, plugs, socket outlets and wall switches with a rating not exceeding 20 A.
- Power supplies and chargers with an output not exceeding 50 VAC or 1220 V ripple-free DC.
- RCDs with a rated residual current not exceeding 300 mA for devices intended for connection to fixed wiring or 30 mA for other devices; and, with a rated load current not exceeding 125 A for devices intended for connection to fixed wiring or 20 A for other devices.
- Control or conditioning devices — self-contained, portable devices designed to control or condition electrical input into household electrical devices.
- Cord extension sockets designed for attachment to flex, with a maximum 20 A rating at low voltage and with a detachable connection.
- Cord-line switches for attachment to flex that manually opens and closes an electrical circuit and has a rating not exceeding 16 A at low voltage.
- Decorative lighting.

• Household appliances including (but not limited to): electric blankets, clothes dryers, vacuum cleaners, portable cooking appliances, dishwashers, fans, floor polishers, hairstyling equipment, irons, microwaves, fridges, heaters, sewing machines, heat lamps, washing machines and water heaters.

Registration requirements

For Level 3 product to be sold legally in Australia, it must:

• be registered on the EESS national database;
• be linked to a registered Responsible Supplier;
• have a valid Certificate of Conformity from a recognised certifier; and,
• be marked with the Regulatory Compliance Mark (RCM).

The EESS national database is a publicly accessible repository for product and supplier information as outlined under the scheme.

A Responsible Supplier is a person, company or business that manufactures or imports in-scope product in ANZ. Responsible Suppliers are required under legislation to register on the national database and to renew that registration each year.

Responsible Suppliers must make a Responsible Supplier Declaration, which states that the equipment supplied is electrically safe and will continue to meet relevant standards and comply with EESS. Additionally, Responsible Suppliers must make an individual Equipment Declaration for Level 3 and Level 2 equipment, confirming that the products meet with relevant standards.

The database also holds product-specific certification details including Certificates of Conformity (issued by a recognised certifying body) as required for Level 3 product under the scheme.

To obtain a Certificate of Conformity, Responsible Suppliers must submit an application to a recognised certifying body. Applications must include test reports from an approved testing entity, physical samples of the product (or clear images showing internal and external construction), along with technical documentation that describes the equipment in detail.

The person granted a Certificate of Conformity is referred to as the Certificate Holder and can be located anywhere in the supply chain, including overseas. In such an instance, a Responsible Supplier may use a Certificate of Conformity under agreement, to facilitate registration of a Level 3 product in ANZ.

Easy identification

All in-scope electrical equipment offered for sale by Responsible Suppliers within ANZ must clearly show the Regulatory Compliance Mark (RCM). This applies to Level 1, Level 2 and Level 3 product.

According to EESS guidelines, the RCM should be placed on the external surface of the product, as near as possible to the model identification. In cases where the size or nature of equipment prevents this, it is acceptable for the mark to be placed on packaging or promotional material. In the case of Prysmian cable, the RCM identifier is printed on the product label. To facilitate easy identification of compliance, the product certification number is also printed on the cable sheath.

In addition to product marking, users can access Responsible Supplier registration details and product information via the ERAC national database search facility: https://equipment.erac.gov.au/registration.

PRYSMIAN

Seriously mate?!

To pet the wrong cable is risky business.

The Electrical Equipment Safety System is there for a reason – to increase consumer safety. And it's compulsory for manufacturers and importers to register and declare that all the equipment they sell meet relevant standards and are electrically safe. So, stocking products that aren't EESS registered is like giving the kiss of death to your business and customers. No need to risk it. Play it safe and choose RCM marked products, always.

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FUGRO TO INSTALL UNDERSEA POWER CABLE IN SOUTH AUSTRALIA

Geointelligence and asset integrity solutions provider Fugro has won the contract to install a subsea power cable for South Australia's distribution network management company, SA Power Networks.

The new 20,000 kVA/33,000 V cable will replace the existing 10,000 kVA/33,000 V undersea cable, which is reaching the end of its life. The subsea asset is a continuous 15 km-long cable, weighing 600 tonnes, and connects Kangaroo Island to the distribution network on the southern Fleurieu Peninsula, south of Adelaide.

Fugro will design and supply the power cable and will use its multirole support vessel, REM Etive, to install it across Backstairs Passage, from Fishery Beach on the mainland to Cuttlefish Bay on Kangaroo Island.

"After installation of the cable our specialist team will also carry out commissioning and associated termination and connection works," said Marcus Hemsted, business development manager at Fugro.

Commenting on project operations, Paul Roberts of SA Power Networks said, "They are scheduled to commence during the last quarter of 2017 and we expect operations to take a couple of weeks. The new cable is expected to be operational by the middle of 2018."

Image supplied by Fugro

©Igor Stevanovic/Dollar Photo Club

DISCIPLINARY ACTION AGAINST THREE ELECTRICAL WORKERS

Queensland's electrical safety regulator, the Electrical Safety Office, has taken disciplinary action against three electrical licence holders.

Under the *Electrical Safety Act 2002*, disciplinary action can be taken against electrical licence holders who perform unsafe, negligent or incompetent electrical work, including licence cancellation or suspension, fines or orders for faulty work to be corrected.

The Electrical Licensing Committee held disciplinary hearings against three workers:

- An electrical contractor working on a solar farm was fined $1000 after a 17-year-old labourer assisting with non-electrical work suffered an arc flash burn to his right hand. The labourer had incorrectly connected in series and short-circuited 40 PV panels. The contractor received a deferred licence suspension for six months until an independent audit can provide evidence of adequate electrical safety systems and procedures to ensure compliance with all regulations.
- After replacing the mains box on a residential property, an electrical contractor failed to test the electrical installation was safe and received an electric shock. The contractor was fined $300 and received a deferred licence suspension for six months until an independent audit can provide evidence of adequate electrical safety systems and procedures to ensure compliance with all regulations. Before the hearing, the electrical contractor completed training to improve their knowledge and skills in verifying compliance and functionality of low-voltage general electrical installations. The electrical contractor's positive steps to improve their skills was taken into account by the committee.
- An electrical worker employed as a communications equipment installer connected a temporary lead to a distribution panel. In connecting the junction box the worker transposed the neutral and active wire. A few months later, a second-year apprentice working on-site received a shock when he came into contact with a live neutral inside a junction box. The electrical worker received a deferred licence suspension for six months until completion of two competency units at a registered training organisation. His licence was also amended to state "all electrical work done under this licence must be done under supervision" for six months.

The Electrical Licensing Committee's actions are in addition to fines and notices already issued by the Electrical Safety Office Inspectors.

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FROM COAL AGE TO STOR-AGE

Gordon Makryllos, Managing Director ANZ at Eaton, reflects on the shift to renewables — and the potential for the future of energy storage and microgrids in Australia.

Renewable energy has long been treated with scepticism. Industry and corporate policies can shift rapidly, seemingly without consideration on their impact to benefits such as jobs and energy independence. With the average life cycle of a power plant between 20 and 60 years — or 7 to 20 elections [1] — many investors are understandably weary of investing in directly policy-driven products.

While numerous countries around the world are reducing their climate emissions, Australia's own emissions are currently on the rise[2] — an unsustainable approach. The time for action is now, as leaving it will only cause further damage for the future.

Getting ready to rely on renewables

Certain questions around reliability may have some basis now, but it must be remembered that a transition to a cleaner future is a gradual, not overnight, change. If the future of Australian energy is set to depend on renewables, effective storage will be vital to better connect these energy sources to the existing grid. Energy storage will also be key to making Australia's national energy infrastructure more resilient and, importantly, enabling it to increasingly rely on clean energy sources.

We've already seen elements of this happening in a less sophisticated fashion in Australia. Australia is still among the world leaders for the take-up of solar panels at household level, and the popularity of solar panels has in turn led to the indirect creation of a decentralised energy model. Household solar panels have created greater generation of power, and individuals are actually able to feed their created energy back into the grid. But it comes laden with inefficiencies; energy is being generated, but it's then being fed into the grid at times when it's not needed, and subsequently lost. This defeats the point of using renewable energy sources in the first place.

Traditionally, the costs of large-scale energy storage have been prohibitive, but these costs are now falling. With battery storage, it's possible to optimise the use of intermittent renewable energy on the grid — further opening up the possibility of powering Australia with clean, renewable energy while shifting further away from our reliance on fossil fuels.

Theoretically, this can also reduce the carbon footprint of Australia's energy supply, better enabling the government to meet the deadlines it has set itself for the Renewable Energy Target. And with the ability to send this stored energy anywhere on the grid, businesses and private residences alike will be able to eliminate harmful emissions and save costs.

Creating a more resilient grid

Another interesting application of storage is in microgrids, which can efficiently and economically plan for local energy generation and distribution, while also increasing reliability and aiding in power quality standards. The implementation of local, distributed power generation and storage can be designed to allow portions of the grid and critical facilities to operate independently of the larger national grid when necessary, helping reduce the potential for unforeseen blackouts. The storage systems that are part of these microgrids of any size can also provide ancillary services to the grid, again strengthening performance and reducing the use of carbon generation.

Energy storage gives businesses and consumers the power of choice to optimise their energy costs and provide them with flexibility for the future. We are already seeing advanced aggregators working with businesses to educate and inform them on the extra money to be made while supporting the transition to a smarter, environmentally friendly energy grid.

The investment opportunity

Investment in storage still needs to increase to ensure renewable energy sources can fully step into the breach. The ever-falling price of energy storage technology today is creating an increasingly viable and attractive investment opportunity — but many Australian businesses are still not aware of this potential.

Energy storage technology can be complex to understand from a commercial perspective. Business owners tend to want to know exactly how the process can save money — and even more importantly, how much money can actually be saved once the cost of transitioning to a new system is factored in. However, the option to sell surplus energy back to the grid through ancillary services opens up new revenue streams that may help offset the cost of electricity and dramatically strengthen the business cases.

That said, it's easy to see for many businesses how storage technology could work as part of a company's overall power quality strategy into the future. Healthcare, telecoms and finance are three industries that need to maintain continuous, high-quality power flow at all times, and so the case for investment becomes almost self-explanatory. For other businesses, it's about making efficient gains for the real estate they have to ensure the viability and innovation energy storage could bring to their business, particularly where their business models are looking at digital connectivity or the Internet of Things.

But businesses in other fields can still benefit from investing in power quality. No matter what field you're in, power spikes or surges can result in damaged equipment, lost data, business downtime and ultimately lost revenue. Storage technology can help avoid these issues, and that's something any company can get behind, irrespective of their specific attitudes towards renewable energy sources.

The long-term future of energy in Australia will be interesting to observe. Electricity prices are consistently rising, and a shift to renewable sources could potentially aid in reducing costs, while still maintaining a high standard of power. Our reliance on fossil fuels cannot last forever, and eventually a transition will need to be made to alternative sources. Energy storage can aid in accelerating this trend and help ensure a clean, stable and cost-effective supply of electricity for Australia.

[1] CSIRO, Change and Choice: The Future Grid Forum's analysis of Australia's potential electricity pathways to 2050, 2013, p.55
[2] http://www.abc.net.au/news/2016-12-22/australia-greenhouse-gas-emissions-increasing-environment-report/8143110

Eaton Industries Pty Ltd
www.eatonelectric.com.au

Image courtesy of Zumtobel.

LIGHTING IN THE WORKPLACE

Employees' tasks are becoming increasingly varied, and purely desk-based work is often mixed with creative, communicative tasks. Global lighting group Zumtobel, in association with the Fraunhofer IAO Stuttgart, has gathered some interesting insights on office lighting from a global user study.

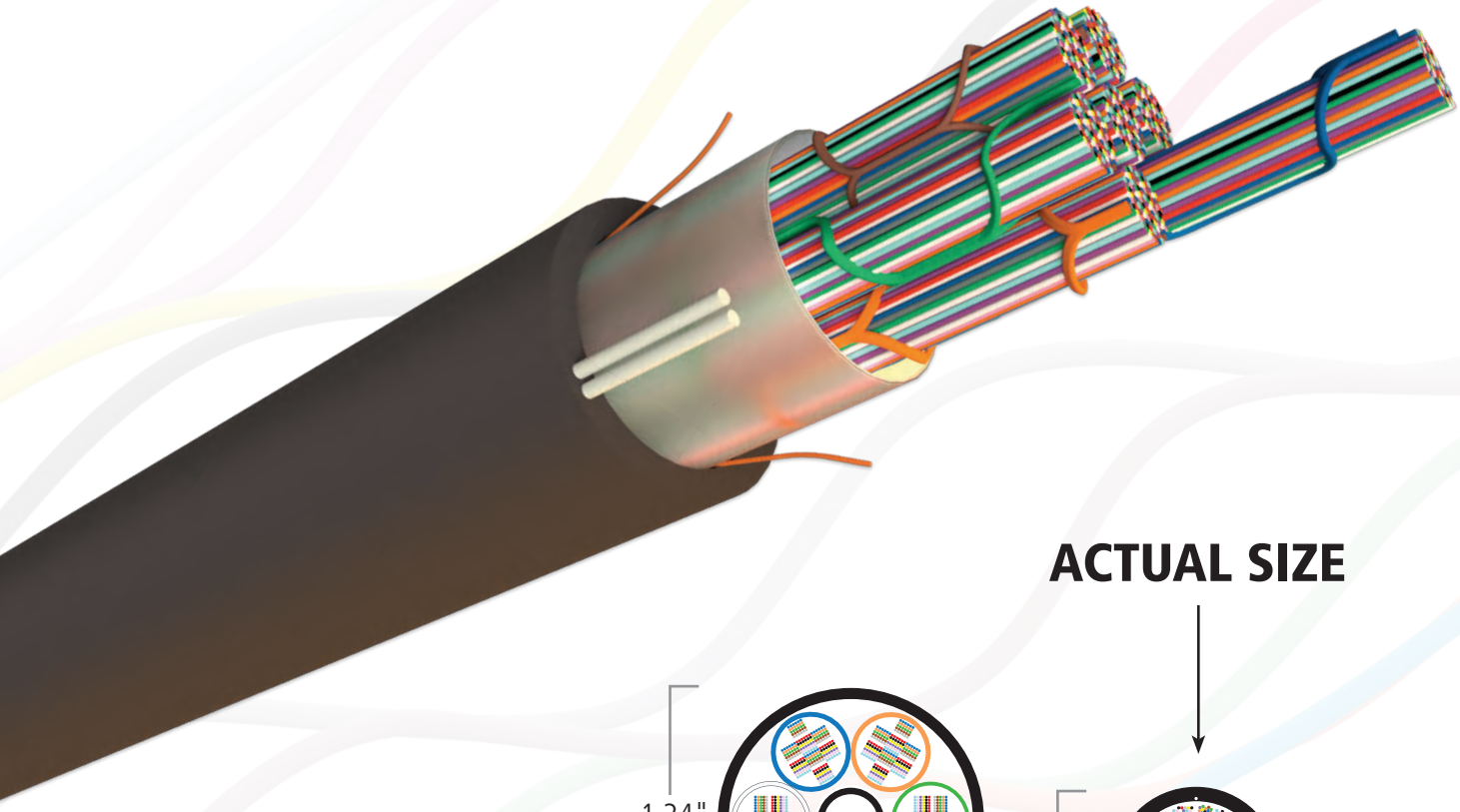
The studies involving over 2000 participants have showed that 77% of people prefer neutral white lighting colours (4000–5000K). More than 60% of the participants said they would prefer to work with an illuminance of 800 lx or more. However, normative planning is limited to only 500 lx in offices.

The results highlight the importance of office lighting and focus on human needs — both as a factor creating immediate added value and in order to increase the attractiveness of working environments. Also to strengthen the employees' loyalty towards the company. The findings are expected to help industry professionals improve their understanding of the different needs of various groups of employees. It is also expected to help increase the perceived lighting quality to a much greater extent, beyond existing limits and standards in future lighting projects.

Treating light in an office space as part of a holistic lighting ecosystem means that it can be actively used to improve employee wellbeing and boost creative potential. In the set of questions regarding layout of their workplace, as many as 30% of study participants indicated poor alignment of their workstation with respect to the window; 82% of survey participants indicated that they prefer a lighting solution with combined direct/indirect components. However, only 38% have this type of lighting solution in their workplace. Moreover, study participants with direct/indirect lighting above their workstation had a much more positive assessment of their wellbeing than participants with purely direct lighting. The survey revealed that very few offices offer employees the chance to adjust the lighting to meet their individual needs. 81% of survey participants reported limited or often no opportunity to control the lighting situation at their workplace. However, the better the options to adjust the lighting, the more satisfied the employees are and the higher they rate their wellbeing.

LEDs were most favourably rated by the survey participants. As regards the preferences for colour temperatures in the office, these are distributed heterogeneously between 3000 and 7000K. However, the users' preference for the range between 4000 and 5000K is by far the most marked. Due to the uniform distribution, differentiation by the specific user groups does not make sense. Almost 57% of all employees stated that they are not able to adjust their office lighting to their individual needs and variable work settings, or are only able to do so to a limited extent. Restricted user access and insufficient options for adjustment correlate with a clearly poorer assessment of lighting quality and wellbeing. Study »

WRAPPING TUBE CABLE



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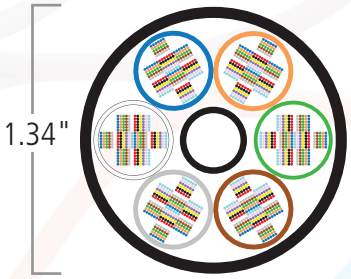
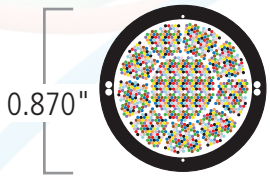


Typical 1728 Fibre
RILT Construction



1728 Fibre
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Doing more with less

AFL's Wrapping Tube Cable (WTC) with SpiderWeb® Ribbon (SWR) is a true game changer. The unique construction of the ribbon fibre makes it easier to work with compared to traditional ribbon fibres, saving installation and splicing time. SWR is easily bunched together allowing more fibres to be used in a smaller space. With AFL's WTC, you can now run 1728-ribbon fibre cables in the same duct that would usually hold a traditional 864-ribbon fibre.

These are not exaggerations. Let us show you the difference our new WTC with SWR can make for you.

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Image courtesy of Zumtobel.

> LIGHTING TECHNOLOGY INNOVATION IN RECENT YEARS HAS MADE MAJOR STRIDES IN TERMS OF GENERATION, DISTRIBUTION AND CONTROL, GREATLY EXPANDING THE RAFT OF POSSIBILITIES OFFERED BY ARTIFICIAL LIGHTING DESIGN.

participants that are able to control their own lighting also had a higher assessment of their personal wellbeing.

What is remarkable is that in the interactive part of the study, more than 60% of survey participants chose illuminance levels of 800 lx or higher. This result exceeds the recommendations in the currently applicable standards and guidelines with their respective minimum levels for the lighting of computer workstations. Independent of the season, the lighting remains constantly switched on in many offices throughout the day. 72% of the study participants said that the lighting in their office is operated for in excess of six hours per day over wintertime. Almost one-third of the people surveyed said this is also true in spring and summer.

Both natural daylight and artificial light affect humans on three distinct levels. Light supports perception in visual terms, light plays an emotional role by influencing our moods and light is biologically significant because it is directly connected to a wide range of physiological processes. Over the course of 24 hours, light is a subtle companion, meeting the diverse demands of a modern life in leisure time and in the workplace, indoor and outdoors. Optimum light is just as important for health, motivation and performance as it is for the completion of specific tasks.

Discovery of a new kind of receptor in the human eye has added a fresh dimension to our understanding of the effect that light has on wellbeing, mood and general health. It was only shortly after the start of the new millennium that light-sensitive ganglion cells on the retina, which incorporate the light-absorbing pigment melanopsin, started to appear on the radar of mainstream science. The ganglion cells containing melanopsin have their highest sensitivity in the low-wavelength spectral range and are therefore particularly receptive to blue light. These discoveries have served to emphasise the key role played by natural light during the course of the day and the year, for both humans and nature. The elementary relationship with nature is not just reflected in these physical connections.

Social psychologists at the University of Bretagne-Sud in France have gone as far as suggesting that the weather situation has an impact on human behaviour. When the sun is shining, we are more open, more confident and more likely to share our telephone number with someone than when the weather is dull and wet. It is also interesting to note that even something as simple as a good weather forecast has a positive effect on the size of the tip that people leave. The shining sun or the pouring rain can therefore have a direct influence on social behaviour and issues of personal finance.

Today, people in industrialised countries spend around 80% of the day inside — with reduced exposure to the essential dynamics of natural light. Lighting technology innovation in recent years has made major strides in terms of generation, distribution and control, greatly expanding the raft of possibilities offered by artificial lighting design. Active Light from Zumtobel opens up this potential and takes into account the special relationship between humans and light. Natural light is the model for Active Light, which blends subtle changes in light colour, intensity and direction at the right time and for the right activity, helping put the crucial lighting dynamics back into everyday life in a range of different applications. In this way, Active Light is said to provide optimal support for the human biorhythm. The default illuminance of 500 lx at the workplace stipulated by the standards is often perceived as insufficient, demonstrating how the lighting level should be increased for specific activities or at certain times of day. Zumtobel's technology like tunableWhite can integrate changing light colours into the lighting scenario as a highly effective design element. That means cold-white lighting moods until early afternoon, followed by lower-intensity warmer light hues as evening approaches. New possibilities in terms of digitalisation and controls also open up further opportunities, helping the light of the future automatically adapt to particular tasks and respond spontaneously to gestures and groups of people.

Zumtobel Lighting Pty Ltd
www.zumtobel.com

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CASE STUDY

Australian circuit breakers to protect UK distribution grid

Image supplied by Siemens

British utility UK Power Networks is using Australian-developed circuit breakers to protect its distribution network.

Siemens has received a 1.5 million euro (AU$2.23 m) order from UK Power Networks to equip parts of its overhead line system with a locally developed Australian innovation, Siemens' Fusesaver technology. As part of the agreement, Siemens will supply 600 Fusesaver vacuum circuit breakers and 200 remote control units (RCU) to UK Power Networks.

Siemens' Australian innovation is exported to over 20 countries and is helping eliminate 80% of sustained electricity outages on rural networks.

"This order is an important milestone in the development of the European market for the Fusesaver," said Stephan May, CEO of Medium Voltage Systems at Siemens. "UK Power Networks is an important partner for us." It is the largest order to date for Fusesavers in Europe and the first one from the UK.

Headquartered in London, UK Power Networks deliver electricity in the capital, south-east and east of England to approximately 8.2 million homes and businesses. The service area covers approximately 30,000 km^2. The vacuum circuit breakers will be installed directly on overhead cables to minimise the number of customers affected in the event of a fault. This is said to minimise installation and maintenance costs while significantly improving supply reliability and grid stability.

"The Fusesaver eliminates the number of maintenance deployments almost entirely," said Matthew Corbridge, a network development engineer at UK Power Networks. He explained that UK Power Networks has an extensive overhead line system in eastern and south-eastern England, and there are a lot of spur lines in this system.

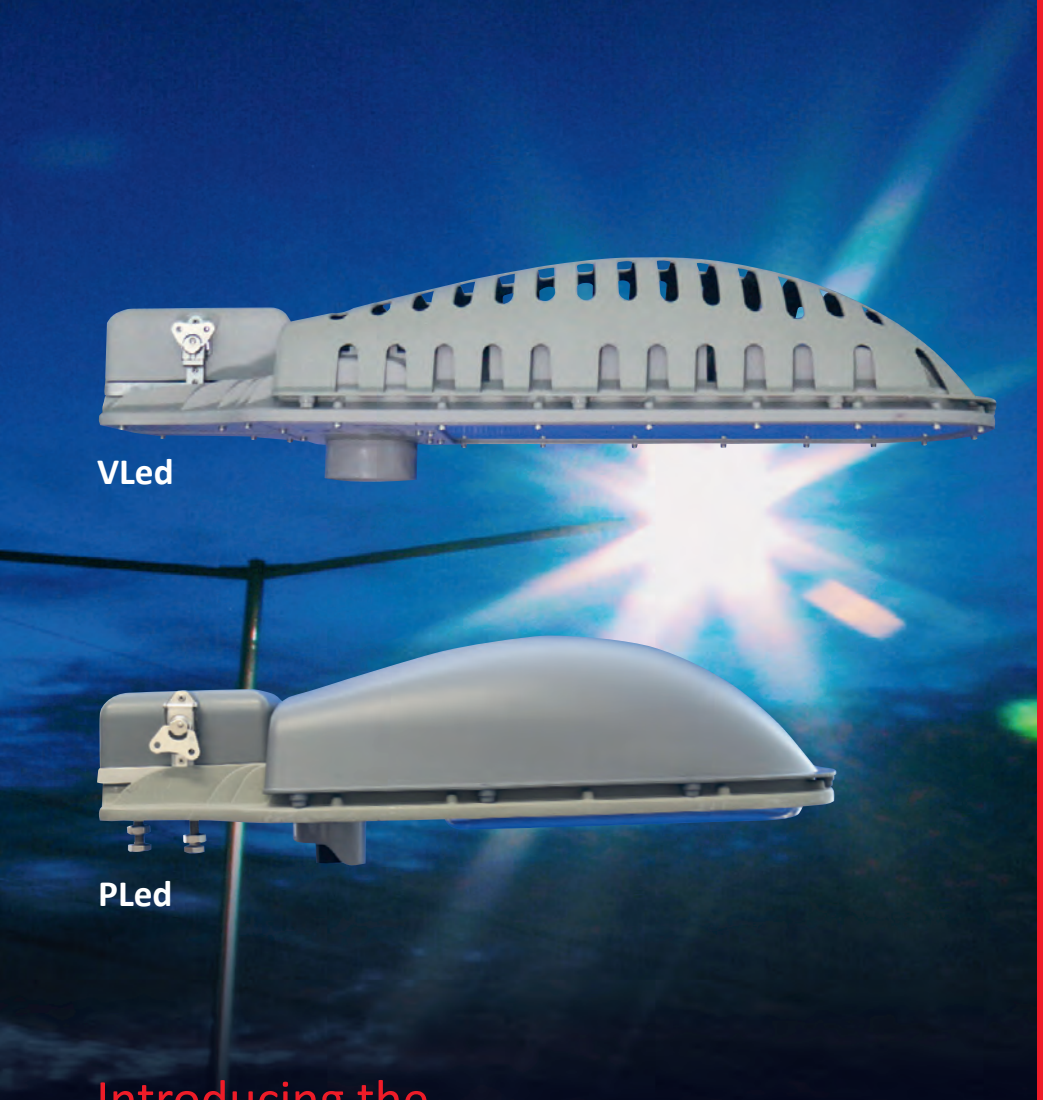
"In our continuing efforts to reduce the number of power cuts caused by a range of factors, we needed a cost-effective solution in order to ensure a reliable power supply for customers on the main lines. The Fusesaver meets these requirements with its highly flexible scalability and its easy installation."

The circuit breakers have helped save millions of hours of electricity outages in rural networks worldwide and, in the process, saved costs for providers, said Andrew Theodore, head of energy management at Siemens for Australia and New Zealand.

Distribution grids on the medium-voltage level can be installed both above and below ground. Many countries, such as the United States, Australia and the UK, distribute their medium-voltage electricity using mainly outdoor distribution grids. Siemens developed the Fusesaver vacuum circuit breaker to protect and improve the supply reliability and stability of these networks.

The circuit breaker weighs 5.5 kg and can be installed in series with existing fuses. If a temporary fault occurs, such as a lightning strike or a tree branch on the line, the vacuum circuit breaker upstream from the fuse opens and protects it from damage. Since a fuse cannot distinguish between temporary and continuous faults, it needlessly interrupts the circuit for a long period of time in 80% of cases. It can also completely replace the fuse, as in the UK Power Networks system. Temporary faults thus only lead to very short interruptions of the power supply. To avoid more extensive damage, the device interrupts continuous faults until the cause of the fault has been eliminated. It is equipped with a wireless communication interface, over which the control and measured data can be transmitted to a PC or the control desk. This establishes the prerequisites for a smart grid.

Siemens Ltd
www.siemens.com.au



Introducing the TST SmartCity Management System

Aldridge Traffic Systems (ATS) is proud to introduce the Traffic SmartCity Technology (TST) – a holistic, wireless solution that monitors lighting and associated assets. Driven by real-time feedback, the TST platform integrates with ATS's award-winning VLed and PLed range of lighting infrastructure, to drive savings through optimisation of the management process.

Total data capture

All data is captured and viewed through the TST – CAMS Portal, allowing you to monitor and control energy usage through a network of TST intelligent remote sensoring, which gathers information on a wide range of inputs: the environment, waste functions, pole tilt or damage, plus the management of asset maintenance.

Full integration

At the heart of the ATS offering are our VLed and PLed lighting systems, one of the most energy efficient, reliable and easily maintained LED assets in the market. ATS has invested 40 years' of experience – and its own R&D division – into developing these assets, and their integration into our TST platform completes the most advanced, efficient solution for customers Australia-wide.

TST
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SMARTCITY TECHNOLOGY

SmartCity
Management System

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- Environmental
- Waste
- Motion
- Tilt
- Video

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- Major Road – V Cat.
- Tunnel Lighting
- Highmast Lighting
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Lighting Systems

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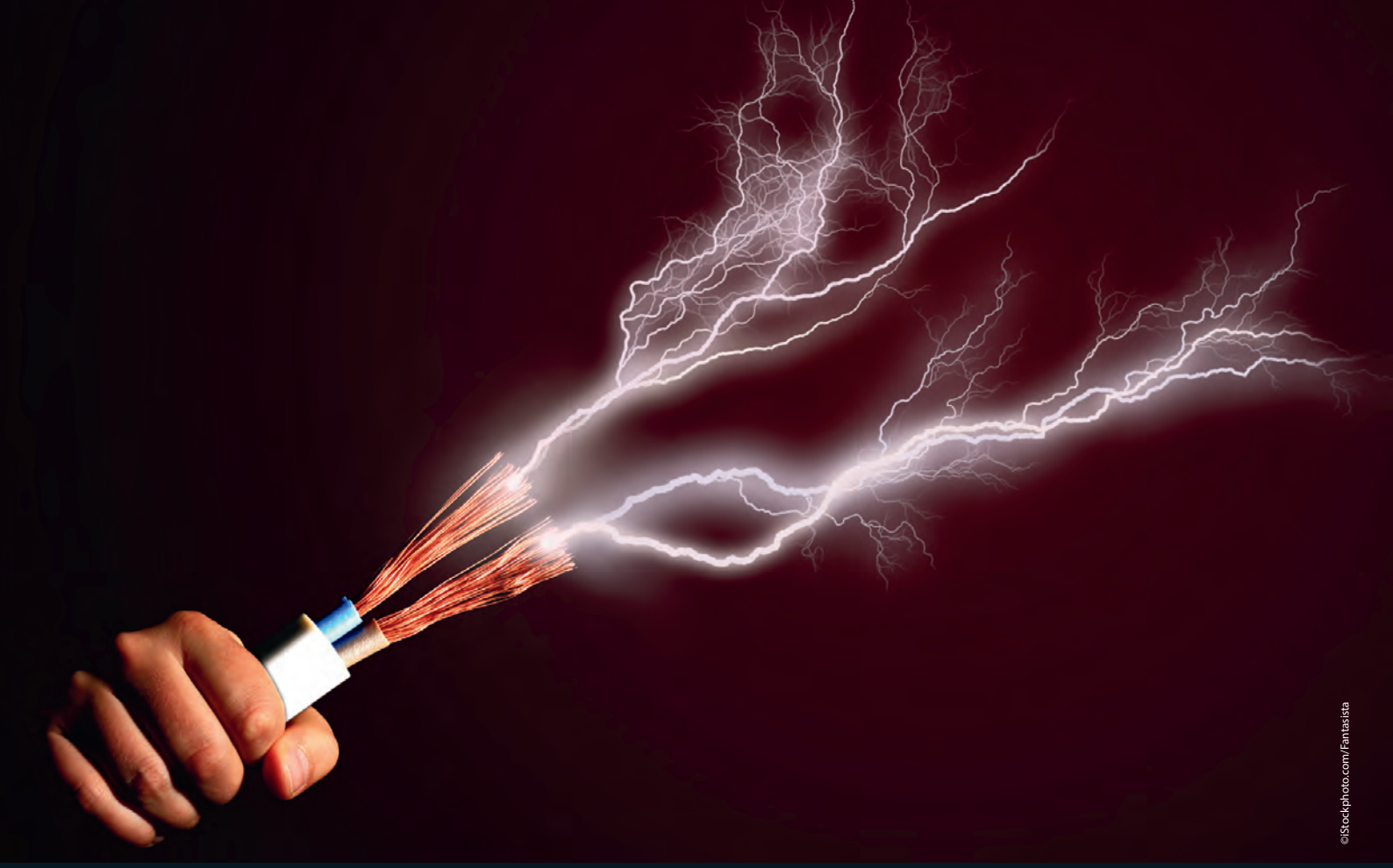

MANAGING ELECTRIAL RISKS

Electrocution is one of the leading causes of death for construction workers and electricians.

Government agency WorkSafe Victoria is notified of one or more electric shock incidents each day; many electric shocks occur during construction work.

The agency has released a document that provides employers and employees with information about the agency's current safety focus on electrical safety in the construction industry and directs them to appropriate guidance.

WorkSafe inspectors routinely take enforcement action in relation to, for example, the following electrical safety issues, including but not limited to:

- Portable electrical equipment has not been inspected and maintained (tested and tagged).
- Residual Current Devices (RCD) have not been inspected and tested at the required intervals.
- Breaching the 'No-Go-Zone' of overhead powerlines.
- Live permanent wiring on-site has not been identified.
- Electrical equipment or wiring has not been de-energised when working on or near it.
- Safe work method statements (SWMS) are missing, inadequate or not followed when undertaking work on or near energised electrical installation or services.

Controlling electricity risks (general)

The Industry Standard — Electrical installations on construction sites — is a practical guide to construction wiring and for the ongoing management of the site electrical installation and portable electrical equipment. The No-Go-Zone rules provide advice on reducing electric shock risks when operating powered mobile plant or when erecting and using scaffold near overhead electrical assets.

Controlling electricity risks (electricians)

Work on or near an energised electrical installation or service is high risk construction work (HRCW) and must not start until an SWMS is prepared. An SWMS must: identify work that is HRCW; state the hazards and risks to health or safety; sufficiently describe measures to control the risks, and describe the manner in which the risk control measures are to be implemented. An employer (including a self-employed person) must stop the work immediately or as soon as it is safe to do so if an SWMS is not being followed.

Registered electrical contractors (RECs) should identify procedures and controls in their SWMS for: de-energisation and re-energisation; ensuring de-energisation is maintained for the duration of the work; and safely performing verification tests and tests for live.

Risk control measures (electricians)

The risks of electric shock or explosion must be eliminated. If that is not reasonably practicable, the risks must be reduced

by using the highest level of risk controls, so far as reasonably practicable.

Examples of risk controls are shown below. A combination of controls will usually be needed.

Hierarchy of control for construction work

Level 1: Eliminate any risk (eg, de-energise all or that part of the installation being worked on and lock and tag out the isolation devices).

Level 2: Reduce the risk by implementing one or a combination of the following:

- Substitute the hazard giving rise to the risk health or safety with a new activity, procedure, process or plant that is of lesser risk (eg, use a non-conductive draw wire instead of metal wire).
- Isolate persons from the hazard (eg, install temporary insulated barriers around live parts).
- Use engineering controls (eg, retractable tip test probes and high impedance testers).

Level 3: Reduce the risk using administrative controls (eg, electrical testing procedures, safety observers, warning signage).

Level 4: Control the risk by providing appropriate personal protective equipment (eg, electrically rated gloves, eye protection, face shield, full coverage arc flash resistant clothes).

Review and, if necessary, revise risk control measures: before making a change to the way the work is performed or if new or additional information about hazards becomes available; if the risks are not adequately controlled, or after receiving a request from a health and safety representative (HSR).

> THE RISKS OF ELECTRIC SHOCK OR EXPLOSION MUST BE ELIMINATED. IF THAT IS NOT REASONABLY PRACTICABLE, THE RISKS MUST BE REDUCED

Consultation

Employees and their health and safety representatives must be consulted when identifying or assessing hazards and risks, and when determining or reviewing risk controls, so far as is reasonably practicable.

Employee responsibilities

While at work, employees must take reasonable care of their own health and safety and that of others who may be affected by their acts or omissions at a workplace. This includes cooperating with their employer with respect to any actions taken by their employer to comply with health and safety duties.

WorkSafe Victoria
www.workcover.vic.gov.au

Remote monitoring solution

The Aggreko Remote Monitoring (ARM) solution is designed to improve productivity and reduce downtime for customers.

It provides real-time asset monitoring and dedicated diagnostic support from technical experts, preventing issues, improving uptime and helping customers keep operations running at maximum efficiency.

The ARM solution includes the Aggreko's Remote Operations Centre (ROC) and technical support team. The ROC monitors thousands of critical equipment parameters while on-site, including operations, loads, run hours, fuel levels and GPS location.

When equipment is outside certain parameters, alerts are sent to the Remote Operations Centre, enabling the team to diagnose and respond efficiently. Aggreko remotely fixes the issue with the site when possible or dispatches a qualified technician if necessary.

The ARM mobile application is available now for iOS and Android and gives users remote access to equipment status within critical equipment parameters while it is on a customer's site. Users will be notified of any critical performance alarms and contacted immediately by the ROC, a response service staffed by expert technicians to diagnose problems, remotely fix issues and proactively prevent failures when possible. The mobile application also offers access to power and sizing calculators, as well as live customer support.

Aggreko Australia
www.aggreko.com.au

Remote power control units

The ENVIROMUX IPDU series secure remote power control units allow users to remotely reboot and control (power on/off) up to eight servers or other powered devices from any location via secure web interface, RS232, SSH or Telnet.

The series include models with two, four and eight outlets. All models allow two external environmental monitoring sensors to be attached.

Power control and management features include: on/off/reboot/default switching, outlet sequencing and power-up delays, manual/scheduled/associated reboot modes, current/line voltage/line frequency/power factor monitoring, normally open (no) or optional normally closed (nc) relay contacts and overload protection via a circuit breaker.

Environmental and IP monitoring features include: temperature/humidity/water detection via external sensors, ping monitoring of up to 8 IP network devices and alert notifications via email/Syslog/LEDs/web page/SNMP. SMS messages sent via an external USB 3G modem are also available on the 4- and 8-outlet models.

Security features include: Local DB or LDAP Authentication, TLS/SSL secure communications, SSH v2, SSLv3, TLC (4-/8-port models only), AES, 3DES/DES, Blowfish, RSA, EDH-RSA, Arcfour encryptions, 16-character username/password authentication and user account restricted access rights.

The 2- and 4-outlet models can be cascaded to increase the number of power outlets and sensor ports. A maximum of 17 systems can be combined via RS485 with one acting as the master controlling 16 slave units.

Interworld Electronics and Computer Industries
www.ieci.com.au

Wireless energy sensor

Schneider Electric's PowerTag is a small wireless energy sensor designed to enhance the monitoring of electrical assets. The sensors monitor the energy consumption of the user's loads in real time for small to large buildings.

Wireless circuit breaker tagging lets users measure and monitor critical loads, and use energy more efficiently and economically on all electrical loads, from IT and HVAC to machines, pumps and process equipment.

By tagging new or existing miniature circuit breakers with this compact device, users can monitor critical loads, proactively manage energy usage in real time and optimise uptime of assets on-site.

PowerTag allows users to customise 25 different email alarms on various load levels and other parameters, to prevent downtime of assets and assist facility managers with remote monitoring of their building.

The sensor provides highly detailed information on a building's electrical consumption and loads — current, voltage, power, overloads, unbalanced phases and more.

PowerTag can be easily fitted without the need for complex wiring or additional space requirements. Its innovative technology enables detection and notification of potential problems before they occur, so building operators can keep their buildings running at peak performance.

Benefits include: precise, real-time data on energy, currents, power, voltage and power factor; accurate active energy (class 1); partial and complete monitoring; the ability to check phase load unbalance; tagging and securing of assets: pre-alarm notification in the event of overload; alarm notification for voltage loss and overload on trip; immediate, automated email notifications; adaptability for use in building systems and EcoStruxure Facility Expert (formerly known as Facility Hero) applications.

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www.clipsal.com

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CATV 620 V HFC tester

Viavi OneExpert CATV simplifies and speeds up the testing and troubleshooting of HFC networks. It is available to rent from TechRentals.

Its user-friendly interface enables technicians of all skill levels to optimise performance. By fixing problems correctly the first time, it minimises the need for rework. The tester simplifies a technician's decision-making process by focusing on three primary tests including OneCheck, DOCSISCheck and ChannelCheck.

AutoChannel is a feature which automatically identifies and instantly builds correct channel plans for testing QAM, DOCSIS and analog services. This enhances productivity by further simplifying the testing process and day-to-day maintenance.

The handheld tester has a modular platform that adapts easily to rapidly changing technologies, making it a futureproof tool for seamless problem-solving. Applications include troubleshooting QAM carriers/home networks and testing Gigabit DOCSIS services, amongst others.

Features include: a technician-friendly interface for all skill levels; real-time channel identification; WiFi 2.4/5 GHz, Bluetooth and StrataSync; and simultaneous ingress and downstream testing.

TechRentals

www.techrentals.com.au

Single-phase inverter

The ABB UNO-DM-PLUS series single-phase inverter delivers an easy and efficient solution for domestic solar installations.

Available in six power ratings, from 1.2 to 5 kW, the inverter has a compact design and shares the same overall volume. It delivers high performance with excellent power density.

Installation times are greatly reduced due to the presence of plug-and-play connectors that remove the need to open the inverter cover, allowing for simple, fast installation. An easy commissioning wizard simplifies the configuration process, resulting in lower installation time.

ABB Australia Pty Ltd

www.abbaustralia.com.au

G.fast analyser

Telebyte's G.fast analyser is a digital storage oscilloscope and spectrum analyser in one portable, high-performance system. Users can capture live field noise and export it to a wide variety of formats with a bandwidth of 212 MHz.

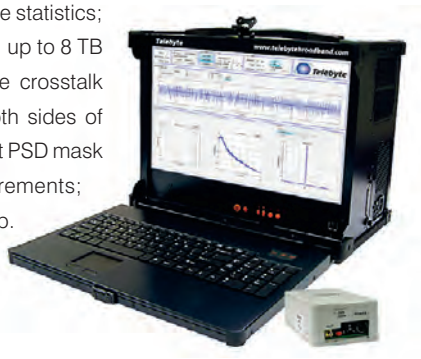
It allows users to perform G.fast PSD mask verification and measure the TDD inter-symbol gap with one instrument using the software's G.fast PSD and TDD analysis features. Bring live noise from the field back to the lab for injection into test loops.

Users can prepare crosstalk and impulse files for export to the model 4902 multioutput noise generator with this 212 MHz system, capable of transparently capturing high frequency interference.

The MATLAB-based interface provides convenient options for range selection, sampling rate, capture length and more.

The solution operates in three capture modes for control of recording of time. It also acts as a real-time, general-purpose, portable data acquisition system. This convenient feature can be used during installation and maintenance or for spectrum monitoring and analysis to support documentation and reports on the field environment.

Key features include: capture, analyse and monitor live noise/interference on a DSL line; includes digital storage oscilloscope; includes FFT-based spectrum analyser; up to 212 MHz; portable or rack-mountable high-performance system with two capture channels; non-intrusive differential mode probe; easy-to-use interface; troubleshoot real field conditions; export to wide range of file types; noise capturing; concurrent visual feedback of capture data and free space remaining; computation of impulse noise statistics; view capture in time/frequency domain; up to 8 TB of storage; G.fast lab testing; evaluate crosstalk on real cable for G.fast; testing on both sides of network simultaneously; performs G.fast PSD mask verification without separate measurements; measures G.fast TDD inter-symbol gap.



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CABLING KEY TO FUTUREPROOFING DATA CENTRES

Greg Whiffin, Director, Commercial Operations, Enterprise Networks

As astute and demanding buyers, state and local government departments are instrumental in driving improved availability, energy efficiency and security of data centre design and infrastructure.

With new digital government services, everything from health records to automated payments rely on superior reliability and 100% uptime of the data centre.

As a result, the government and its network suppliers are under more pressure than ever before to meet rigorous uptime requirements — there's no room for shutdowns for maintenance, repair or replacement of equipment. Connectivity failure is not an option. And, solution flexibility is critical for co-location data centres serve the government objectives of optimal speed of deployment, stability and scalability.

Such was the case for Australian Data Centres (ADC). One of the first organisations to be accepted by the federal government agencies onto their Data Centre Facilities Supplier Panel, ADC was required by the mandate to deliver resilient facilities to meet government and federal bodies' speed and capacity requirements in the future, today.

The as-a-service approach — allowing customers to choose their technology and level of support — is core to ADC. As a Tier III certified facility located in the ACT, ADC's infrastructure is required to support from as little as a rack to private suites and larger footprints.

Like all technology service providers, data centres are increasingly focused on enabling greater flexibility and customisation in their hardware and software infrastructure. Co-location data centres must be equipped to securely manage customer information and access without any fear of downtime, while also handling both current and future IT requirements.

Let's examine why deploying the right cabling infrastructure provider is key to meeting and exceeding stringent public sector expectations:

Speed of deployment

Selecting a high-density pre-terminated cabling system is essential when it comes to simplifying installation and superior performance in the data centre, laying the foundation of connectivity from the fibre distribution rooms. Solutions comprising optical trunks, harnesses, modules, housings and jumpers are inherently environmentally friendly, requiring less energy for powering and cooling than copper systems.

By deploying an all-optical solution that can be installed faster than traditional cabling systems, the network will be ready and capable of accessing new revenue streams fast. Custom-engineered components enable simple integration into common SAN directors, while the pre-terminated components allow for reduced installation time and faster moves, adds and changes (MACs).

Meet future capacity requirements, today

It's no easy task to deliver seamless bandwidth capacity every time customers need more provisioning and increased service velocity. Space efficiency is a key priority for public sector data centres to ensure they're able to seamlessly grow and scale as the needs of

Images supplied by ADC.

multiple government departments and their client increase, meeting all demand spikes seamlessly. On top of this, there's a business imperative to minimise further real estate needs. This challenge can be addressed by maximising density within a small footprint to optimise space and capacity.

ADC turned to optical cabling to improve duct utilisation, enable smaller enclosures and provide a future-ready infrastructure. Premium singlemode fibre offers ADC and its clients greater flexibility and confidence with low loss and less clutter, and increases real estate utilisation by up to 50%. With the right structured cabling architecture, ADC can support power densities up to 33 kW per rack and custom build to suit each customer's requirements, without having to add more floor space. ADC is able to consolidate its fibre footprint for the future, stay ahead of MACs and manage demand growth cost-effectively. This also ensures ADC maintains the robustness and reliability required to meet Tier III standards at all times.

> GOVERNMENT DATA CENTRE OPERATIONS CURRENTLY GENERATE AROUND 300,000 TONNES OF CARBON ANNUALLY. MODERN DATA CENTRE TECHNOLOGY CAN REDUCE THIS CARBON FOOTPRINT BY AROUND 13% OR 40,000 TONNES PER ANNUM.

Improve environmental efficiency

Government data centre operations currently generate around 300,000 tonnes of carbon annually. Modern data centre technology can reduce this carbon footprint by around 13% or 40,000 tonnes per annum. While reliability and speed of access to data are the key concerns for data centre operators, sustainability is an increasing priority for the public sector.

With high security levels and high energy efficiency minimising its environmental footprint, ADC's data centre is meeting the requirements of defence and law enforcement agencies. The investment in tip-to-tip fibre-optic connectivity throughout its data centre also means ADC can support the government's focus on a more ecological use of resources. The data centre's infrastructure will scale, as and when needed, without compromising availability, security, operational simplicity or total cost of ownership (TCO).

High-speed connectivity is a critical element in co-location solutions. The greater flexibility a solution provider builds into connectivity, the better the end result for the customer. This is especially true for the public sector where data centre providers need to meet stringent government requirements both today and in 25 years.

Corning Optical Communications P/L
www.corning.com

MASTER ELECTRICIANS AUSTRALIA

Moving into unchartered territory

Malcolm Richards, CEO

From Snowy Hydro 2.0 to the Queensland government's move to bring Stanwell's E gas-fired power station out of hibernation and the closure of Hazelwood coal-fired plant in Victoria, the nation is at odds about how to responsibly cater to the ever-growing energy needs of our own population, as well as the world's.

While we won't be ditching traditional power sources any time soon, investment into next-generation energy sources has never been higher, with a recent report from Mercom Capital Group finding that venture capital funding had reached $422 million (for 10 deals) in the battery storage sector in the second quarter of 2017 alone.

Smart grid and energy-efficient technologies will have to cater to a global surge in battery demand over the next few years — encompassing everything from large-scale generation farms to electric cars and home solar storage, as part of a wider trend in the recovery of cleaner energy investment.

Consumer expectations are changing just as swiftly — customers are no longer content with the 'standard' option but are more interested in individualised alternatives, fully integrated services and performance, and enhanced functionality. All of this, of course, with high energy efficiency.

The UK government recently announced that the first part of its £246 million investment into battery technology and storage had begun, with Nissan announcing the rollout of electric vehicle (EV) vehicle-to-grid (V2G) technology to allow vehicles to be fully integrated into the electricity grid, improving grid capability to handle renewable power and giving owners/business with large EV fleets the opportunity to create mobile energy hubs. Nissan also announced plans for its batteries, once they've been used in cars, to become stationary energy storage units that can be filled with renewable sources.

In Massachusetts, the Energy and Environmental Affairs department announced a 200 MWh energy storage target to be achieved by 1 January 2020 — building on a $10 million commitment to analyse opportunities to support its storage companies and develop policy to encourage energy storage deployment.

Closer to home, a joint venture between two high-profile Brisbane energy sector players was awarded a $2 million grant towards their $12 million endeavour with a research team from The University of Queensland and University of New South Wales, which is aiming to bring screen-printed batteries to market within three years.

Printed Energy, backed by Trevor St Baker and Brian Flannery, is developing ultrathin and flexible batteries, printed in a roll-to-toll process similar to printing a newspaper. The batteries can be adapted to almost any shape and have the potential to power everything from disposable medical devices, smart cards and wearable electronics to large-scale power storage.

Printed Energy's grant arrived on the back of South Australia's announcement of a partnership with Tesla to build the world's largest lithium-ion battery, after widespread load shedding and blackout issues led the government to prepare a $550 million energy plan to entice the private sector.

An array of lithium-ion batteries will be connected to the Hornsdale Wind Farm (currently under construction), with the capacity to store 129 MWh of energy and be capable of an output of 100 MW of power at a time.

French company Neoen is also involved in the deal, and says the battery — on track to be delivered by the time summer rolls around — would be used to primarily provide stability for the power grid, which has traditionally been the domain of coal, gas and hydro, rather than wind or solar.

Battery, smart grid and energy-efficient technologies will undoubtedly lead the electrical industry into unchartered territory over the coming years, bringing with them entirely new possibilities for businesses as the practical, consumer-level applications of these, and so many more advances in the field, begin to take shape.

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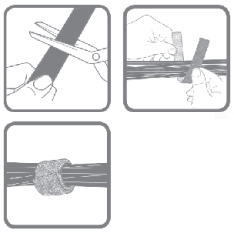

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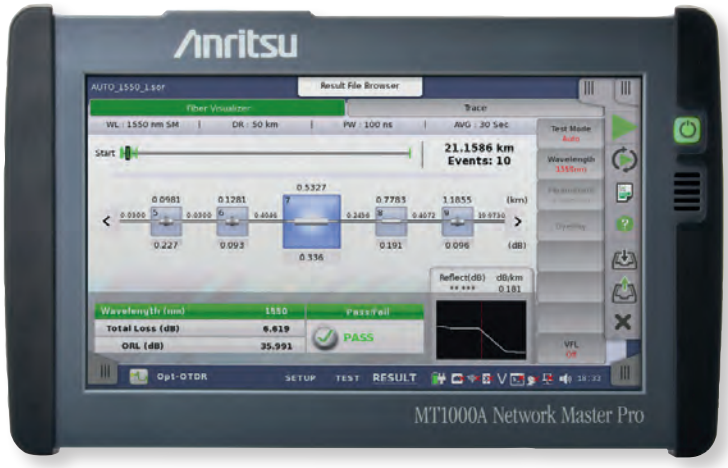

Tri-wavelength OTDR

Anritsu's tri-wavelength OTDR module for its Network Master Pro MT1000A portable optical tester provides field engineers and technicians with a comprehensive test tool to verify fibre lines in core, metro and mobile networks.

The module supports macro-bend testing using the 1310/1550/1625 nm wavelengths. It also supports 46 dB dynamic range which allows the MT1000A to test long transit links and high loss networks.

The module also features Anritsu's Fibre Visualizer, a fault location function that simplifies the entire testing process. It automatically selects the testing parameters to ensure the proper set-up and provides a simple graphical summary of the fibre under test within seconds. Fibre Visualizer also has individualised Pass/Fail analysis to simplify fibre-optic testing.

Suitable for installation and maintenance of fibre networks, all Network Master Pro MT1000A OTDR modules will benefit from specialised functions to make field testing more efficient. A construction OTDR mode provides an automated method of testing numerous fibres at multiple wavelengths during cable installation.

A single set-up screen initiates a testing wizard, ensuring all fibres are tested and results stored using consistent file naming. Additionally, a bidirectional measurement function has been added for simple event loss analysis.

The compact, battery-powered and easy-to-use tester provides a variety of testing capabilities in a rugged, field-portable package. A lightweight instrument, the MT1000A simplifies the daunting task of collecting and interpreting data, with an easy-to-use GUI and clear summaries allowing users of any skill level to operate the instrument to its full potential.

A multifunction tester, the MT1000A is field upgradeable and can be configured with an array of OTDR modules and transport testing functions, including RFC2544/6349, Y.1564, OTN and CPRI/OBSAI, to address current core, metro and mobile backhaul network needs, as well as the flexibility to expand to support future technologies.

Anritsu Pty Ltd

www.anritsu.com

Mini Cat 6A patch cords

The Warren & Brown Category 6A mini shielded patch cords allow for data transmission between patch panels, outlets and/or IT equipment. Shielded U/FTP patch cords feature individually shielded pairs, providing optimum protection against EMI.

The smaller conductor size (AWG28) reduces the overall patch cord diameter when compared to standard Category 6A shielded patch cords, thereby reducing congestion around patching fields and cable managers and providing greater flexibility.

The product is included in the HypaConnect ICS and forms part of the end-to-end cabling solution.

Warren & Brown Technologies

www.wbtnetworks.com.au

Cable tray

Drillcut's Smart Tray is easy to install, handles tight bends, is compatible with other systems and is strong enough to hold tough loads. The product is said to save time for anyone looking to house small to medium-sized cables such as TPS, sub mains and data comms.

The tray sets itself apart from other products in the market in three ways. First, closer segments and double the tie-off points allow for tighter bends or rises where required. Second, the product is claimed to have a superior load rating compared to similar competitors. Finally, it has complete compatibility with other systems, making connection quick and easy, as well as reducing the need to carry multiple ranges.

The tray comes with a cable depth of 45 mm, in lengths of 3 m. The tray is rated to hold 37 kg/m at 3 m spans. Four widths from 150 to 600 mm make it suitable for a wide range of jobs from simple to more complex installations.

The product is available in three different finish options: Galvabond, Powder Coated or Zinc Passivated. It is suitable for trapeze-supported or surface-mounted cable management.

Drillcut

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LESSONS FROM THE WORLD'S SMARTEST GRID

*Adrian Clark**

Well known for being an early adopter of technology, Japan has been no different when it comes to the Internet of Things (IoT). Tokyo, Japan's capital city, recently modernised its traditional electric power grid, the fourth biggest in the world, with more than 10 million advanced meters and devices.

From what was once a static infrastructure, the electricity grid is now a highly connected network of devices and sensors. Japan's willingness to embrace the development of smart networks through IoT has proved that these kind of deployments are possible in even the most densely populated locations on the planet.

Japan's main utility company, TEPCO (Tokyo Electric Power Company), has been able to optimise capital, better manage repairs to the grid and respond faster to peak demand and supply by accessing real-time information from Landis+Gyr's smart meters. This also enables the utility to provide its customers with real-time energy usage data and respond to millions of demand response requests each hour.

Globally, the introduction of smart networks has the potential to change the game for the utility industry and offer a compelling cost saving proposition to end customers. To date, though, outside of Japan, the adoption of smart grid and communication and information technologies has been slow-moving.

While a number of different sectors have willingly embraced the idea of IoT and smart networks, the true possibilities of the utility industry in advancing smarter solution initiatives are yet to be seen.

So what's holding us back?

Over the last decade, we've seen advancements in cloud infrastructure, open-source data software and scalable storage which can now accommodate big data.

Subsequently, in many industries, conversations have shifted around how to make more informed decisions for our future, using the data at our disposal; data that didn't exist even five years ago. And although there are many different permutations of IoT and big data which could take up to a decade to realise, we're already witnessing some of the large-scale rewards of smart solutions.

Access to real-time information enables cities and governments to monitor urban congestion and pollution, generate more efficient waste collection systems and create responsive households that can react to dynamic energy prices. Australia is a leader in many of these fields; however, in today's global market, our local utilities must innovate too.

Opportunities for utilities

There's a significant opportunity for Australia to learn from other countries in Asia — and the developing world — that are leveraging data and analytics and smart networks to monitor electricity outages and optimise storage on the grid, because there is a seemingly more pressing need to do so. These are countries with population multiple times what we have, and just like what we've seen in the telecommunications sector, we'll see a leapfrog in technological innovation as these countries build out increasingly sophisticated energy solutions.

The ability to extract data from a network of connected devices will enable utility companies to make smarter decisions around demand, know where to upgrade services and know which infrastructure

has to be replaced within the grid. It will also help utilities manage, measure and optimise flows and consumption to help predict future usage and outages.

For retailers, the access to new information from this network will mean they can better service their customers, be proactive in managing their billing and provide insights to optimise their use of capital. It's this ability to foresee demand and loads, and respond to problems more quickly, that has benefits for the entire population.

Smart meters allow for electricity use to be measured in real time, and they can send and receive data remotely on electricity consumption and outages. They allow meters to be read remotely too and eliminate the need for a service person for connections and disconnections. They also allow for varying prices for electricity, depending on demand. We're advancing the development of networks in Australia connecting to Telstra's CAT-M1 network in Australia to extend the depth and breadth of coverage.

For utilities, this will provide robust coverage to ensure the success of smart metering rollouts. For households and individuals, the benefits come from increased control of consumption and devices, with usage adjustable depending on prices. It's a compelling value proposition for the customer.

The good news is that some regions in Australia, for example state governments in Victoria and New South Wales, are beginning to embrace and support IoT infrastructure with the rollout of smart meters, encouraging all households to make the switch. The fact that we're seeing legislation change, ensuring all new meters installed in homes are smart, is certainly a step in the right direction. It's the infrastructure that's built around this that will be the next step towards a truly smart network, the sort of which we're already seeing in Japan.

Overcoming challenges

In Australia, one of the key challenges we face is that a myriad of different stakeholders are involved in the decision-making processes for this sort of initiative. Local councils, state governments and utilities are each accountable to a diverse range of communities and they all have to follow different policies and regulations. The structure of these siloed organisations creates a complex path to develop a framework for deployment of smart solutions. To overcome this, it's important for all decision-making parties to align. There are a few countries where all responsible organisations are streamlined in this way.

It's not surprising that we have seen significant progress in the developing world, because it often takes a lot longer to refresh a generation of infrastructure than it does to build from scratch. In developed countries, it's often difficult to convince all parties of the requirement for change. A way around this is to encourage greater collaboration between leaders across different industries that all place public benefit at the centre, and hear from leaders in those sectors who can talk about the benefits of their own initiatives.

For utilities, as we've observed in Japan, smart meters and grids could put the power back into the customer's hands for high-tech, home energy control. The integration of renewable energy sources can also be far simpler, and ultimately shift mindsets when it comes to how we view our energy consumption.

By exploring new partnerships and ecosystems, utilities can become important strategic partners to governments and drive the advancement of smart networks. If all technology initiatives require energy to function, it seems flawed that we'd ever leave this sector behind in considerations of IoT. In fact, it presents some of the richest territory in which to innovate.

**As the CEO of Landis+Gyr's ANZ and SEA businesses, Clarke works in a market with the highest penetration of solar per capita in the world and a fast-changing regulatory environment in Australia. Under his leadership, he has defined a whole new business proposition, featuring smart grid, smart cities and AMI investments, across Asia Pacific. In response to this, he led the creation of a new services business, intelliHUB, to facilitate a market-led smart technology deployment. Before joining Landis+Gyr, Clark was the Chief Technology Officer for Australia's largest utility, Ausgrid, where he won and delivered the federal government's landmark 'Smart Grid, Smart Cities' program.*

Landis & Gyr (Aust) Pty Ltd
www.landisgyr.com

NETWORK TESTING 101

Choosing the right test equipment isn't always easy. With that in mind, data cable and network tester manufacturer IDEAL Networks offers some insights to improve technicians' understanding of different network layers and the testers they require.

Image supplied by Ideal Networks.

By understanding the different functions of the most common types of testers available and their typical applications, technicians can make the right choice, preventing downtime, avoiding poor customer satisfaction and ensuring jobs remain profitable and efficient.

Cable verifier

Verifiers are used in the physical layer or 'Layer 1'. This layer of an Ethernet/IP system comprises the electrical signalling and physical cabling components that connect devices on the network.

Choose a verifier to test electrical continuity of the cabling between two points, checking for shorts, opens, and crossed or split pairs. A verifier may also offer troubleshooting functions such as measuring cable length and distance to fault, cable tracing with audible tone generation or visual port blinking, Ethernet service detection and PoE testing.

Every cabling technician should carry a tester which acts as a verifier to test every link after it is terminated, as more than 80% of all network problems can be traced back to a physical cabling fault — which a verifier can quickly and simply detect.

Cable certifier

Technicians or installers who work on jobs where a cable manufacturer warranty is required should choose a certifier. Also used on Layer 1, a cable certifier uses radio frequencies on the cabling to measure performance to international ISO and TIA standards, providing a pass or fail result, ensuring that the cabling can support a wide range of applications.

Certifiers tend to require a larger financial investment, but many of the top-end models have additional useful functionality, such as the ability to work on both copper and fibre cabling, troubleshooting, and options to export a wider range of data and reports.

Network transmission tester

To make the right choice of tester it is important to understand that transmission testers can offer functionality for testing across both Layer 2 and Layer 3 of an active network. So, to select the right network or data transmission tester, it is important to understand the layers of the active network and how these testers can work differently.

Technicians that need to measure the successful transmission of data across a cable or through a network should choose a Layer 2 data transmission tester. Layer 2 is the data link layer which provides data transfer between two directly connected nodes or two nodes on the same network. It detects and corrects physical layer problems, provides media access control (MAC), encodes and decodes data frames, performs error checking, and synchronises devices with systems. The result of the Layer 2 transmission test is a data loss ratio expressed as a percentage of total frames successfully transmitted or the number of dropped frames.

Technicians that need to test WANs (wide area networks) to measure bandwidth between different locations across the internet should choose a Layer 3 transmission tester, as this will be capable of generating complete packets with IP addresses. Layer 3 is the network layer which provides data transfer between nodes on different networks. Layer 3 encapsulates Layer 2 frames inside of a data packet, adds source and destination IP address to each data packet, and assigns an IP address that is unique to each node on its own network.

Qualifier

This type of tester probably causes the most confusion when selecting equipment, especially as some people mistakenly select a qualifier under the impression that it will conduct Layer 2 network testing. However, qualifiers do not generate Ethernet frames with an MAC address that can be read by active network devices, so a qualifier is actually a Layer 1 tester.

Also, as impressive as 'qualifying' a cable may sound, this type of tester cannot be used to prove performance like a certifier. This tester should only be chosen by those looking to conduct simulations to test whether the cable can successfully transmit data from point to point. However, many Layer 2 transmission testers also include this functionality and so may be a better use of hardware budget.

IDEAL Networks offers a wide range of data cable and network testing equipment, including certifiers, transmission testers, verifiers and troubleshooting testers.

IDEAL INDUSTRIES (AUST) Pty Ltd
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Energy chain

The E4.1L energy chain from igus is a light, cable-carrying e-chain.

Due to its separator system, individual division of the energy chain's interior is easier than before. Easy to open and fill from all sides as required, the energy chain offers flexibility for harnessing.

It is now easy to insert shelves on several levels for interior separation as needed. In addition, the opening mechanism of the crossbars along the inner and outer radii ensures fast filling with cables and hoses. These captive crossbars, which can be opened with a screwdriver, can be pivoted open to 115° and latched into their final position. If necessary they can even be removed completely, fitted again and closed by just pressing down. The rounded edges of the crossbars and separators of the chain also ensure a long service life of hoses and cables. In addition, notches and a positioning scale enable optimum separation of the energy chain.

In addition to special harnessing, the company offers harnessed systems from a single source, whether they be simple or complex, from planning and design of the energy chain systems through to individual harnessing and on-site installation. All moving components were developed, tested and optimised to work with each other in igus's own test laboratory. With these readychains, users receive a complete pre-harnessed system direct from the manufacturer.

Treotham Automation

www.treotham.com.au

Dual-channel time domain reflectometer

The Megger TDR2000-3P is a highly portable, high-resolution, compact dual-channel time domain reflectometer (TDR). With a large colour screen, it is suitable for locating faults on paired metallic cables in applications as diverse as street lighting, telephony and CATV. It is available to rent from TechRentals.

The product has a minimum resolution of 0.1 m and a 20 km maximum range depending on the velocity factor selected and the cable type. Five output impedances are available, including 25, 50, 75, 100 and 125Ω. The fault locator comes with an auto impedance matching feature and a velocity factor between 0.2 and 0.99 to meet any cable test requirements.

Powered by Li-ion rechargeable batteries, the unit is dustproof and showerproof to IP54. It can test powered cables and comes complete with two pairs of fused test leads.

Features include ultrafast pulse for near-end fault identification; comprehensive dual-channel capability; auto set-up mode for instant use; and Xpert guidance to potential fault.

TechRentals

www.techrentals.com.au

Dual camera

The MOBOTIX Dual M16 camera features interchangeable sensor modules as well as the latest MOBOTIX system technology.

Features include: modular system with exchangeable image sensors; weatherproof premium dual camera for all kinds of applications (IP66); combined day/night camera for 24-hour use; 6 MP sensors with Moonlight Technology; video motion detection software MxActivitySensor.

The Allround Dual body module comes with VarioFlex mount, connection cables for sensor modules and network, and the front element. The sensor modules, which need to be ordered separately, are prefocused at the factory and can be supplied in any desired combination of day or night sensors with lens choices from telephoto to wide angle. The modular system, which provides maximum flexibility when configuring the camera, is also easily reconfigured or repaired by replacing a sensor module.

MOBOTIX

www.mobotix.com

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IDEAL Networks' testers now available from **TRIO Test & Measurement.**

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- **LanTEK III** is an easy to use cable certifier that meets existing TIA and ISO/IEC performance requirements. **Certifies up to CAT7A.**
- **NaviTEK NT** is a network tester for troubleshooting and maintenance of active and passive copper and fibre networks.
- **LanXPLORER Pro** is used for analysing and diagnosing problems in networks, cabling and Ethernet devices using copper, fibre and Wi-Fi interfaces.

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Surge protection for solar panels

The Novaris SDPV and SDD2 family of surge diverters are designed to provide reliable protection for any solar panel installation.

The two protective devices are specifically designed for solar systems in Australia. The SDPV family of surge diverters provides the highest level of protection for photovoltaic arrays connected to the power supply grid via an inverter system. These systems typically produce voltages of 600 V for domestic applications and up to 1000 V for commercial installations, while the SDD2 family of surge diverters offers a suitable solution for low-voltage DC systems of up to 150 V.

Housed in a DIN-compliant fail-safe metal enclosure, these diverters are particularly suitable for photovoltaic arrays connected to a system where power is stored in a battery bank for later use.

With an operational life of 20 or more years, the chances of an electrical disturbance causing damage over this time can be quite high. Like all electrical equipment, photovoltaic systems can be damaged by both direct and indirect lightning strikes and other overvoltage disturbances. Protection against these disturbances will help to ensure that a long operational life is achieved.

Control Logic Pty Ltd
www.control-logic.com.au

Data cables

Belden's DataTuff Cat6A and Cat5e Profinet cables carry mission-critical data from sensors, actuators and other devices on the factory floor to back-office applications for smarter management.

The rugged and flexible cables can transmit data at up to 10 Gbps and are particularly suitable for high-volume transfer in data-intensive industrial operations. Made for efficient factory automation, the cables make it easy to install the network and maximise uptime even in the most demanding indoor or outdoor environments.

Other features include: cable options for trailing or torsion applications, ruggedised with UL and IEC ratings, and allowing up to 2 and 5 million flexes; quad design compatible with Siemens Fast Connect connectors and Belden's entire Profinet portfolio; UL standards, including CMX Outdoor and PLTC, allow cabling to be used in Class I Div II hazardous areas, as well as outdoors, maximising uptime even in harsh environments; and 4-pair PROFINET type A and B for 10 Gbps transmissions.

Belden Australia Pty Ltd
www.belden.com

Light control sensor

The PE10 is a PE cell light sensor specifically designed for mounting on M-Elec NOX LED floodlight accessory brackets.

The IP44-rated PE10 switches the light on or off according to the level of ambient light. It also can be used to switch on other lighting if required.

Features include: power of 100–240 VAC; frequency of 50/60 Hz; current of 10 A; power rating of 300 W max for LED, 1000 W max for incandescent lighting; sensitivity of 5–100 lux; diameter of 63 mm and height of 75 mm.

M-Elec Pty Ltd
www.melec.com.au

Protective headsets

The Honeywell Howard Leight Sync Wireless protective earmuffs integrate Bluetooth wireless technology allowing workers to talk on the phone, connect with co-workers, get instructions and perform tasks without sacrificing hearing protection in noisy or dangerously loud environments. The headsets are designed to allow workers to stay connected while continuing to protect hearing on noisy job sites. They can block out up to 80% of background noise.

The headsets connect wirelessly via Bluetooth to most smartphones and feature a boom microphone that enables workers to answer calls and carry on clear phone conversations while keeping the phone safely in a pocket. The wireless format eliminates the need for cords or cabling that can pose trip, slip or hand hazards.

Features include: Bluetooth 4.1 offers improved connectivity and reliability of data transfer and use with 4G cell phones; ergonomic design for simple operation, with volume control buttons and flashing coloured lights to indicate different settings; boom microphone that rotates out of the way when not in use; volume management technology limits output volume from portable audio devices to 82 dB; airflow control technology provides optimal noise reduction across all frequencies to SLC80 31 dB; steel headband construction and padded ear-cups for long-wearing comfort and use; 16+ hour rechargeable battery.

Honeywell Safety Products Australia Pty Ltd
www.honeywellsafety.com

Thermal cameras

The FLIR Exx-Series E75, FLIR E85 and FLIR E95 thermal cameras are suitable for NDT inspectors, tradies and professionals in HVAC, electrical contracting and maintenance fields.

All three models offer performance improvements in resolution, temperature ranges and measurement capabilities. The lenses are interchangeable and the focus has been upgraded to laser guided. The touch screen is larger and brighter.

The lowest resolution is 320 x 240 for the E75 (76,800 pixels). The FLIR E85 is 384 x 288 (110,592 pixels) and the FLIR E95 offers a 464 x 348 (161,472 pixels) image. Sensitivity (NETD) is the same on all three imagers, rated at 0.04°C for the standard 24° lens. Sensitivity gets even better for the 42° wide-angle lens (0.03°C). Temperature ranges vary by model, but all three have sufficiently large ranges for most applications.

One of the features of the series is the laser-guided auto-focus. The cameras have a built-in laser distance meter that can precisely measure to 30 m. The E85 and E95 also use the laser distance meter for another feature: calculating area. All distance and area measurements are recorded with any corresponding image.

The imagers have visible light cameras as well as thermal cameras, plus FLIR MSX image enhancement. Also included is UltraMax super-resolution imaging, to combine multiple images into a single image of double the original resolution. Communications include Wi-Fi to a phone or tablet, Bluetooth to FLIR electrical and moisture instruments, and even GPS to record where each image was taken. The users can capture still images or thermal video (and even time lapse on the E95). The cameras have a tough rubberised housing to resist dust and water.

FLIR Systems Australia Pty Ltd
www.flir.com.au

Vector network analyser

The R&S ZNLE vector network analyser is a light, compact, easy-to-use instrument that simplifies S-parameter measurements.

The analyser is designed to address the requirements of customers looking to perform RF measurements to characterise components such as antennas, attenuators, filters and PCBs. The stand-alone instrument weighs only 6 kg and has a foot-print of just 408 x 235 mm, saving space on the workbench.

The two-port vector network analyser not only saves space but also provides fast measurements, not least due to its easy-to-use S-parameter wizard. The product performs bidirectional measurements of the S11, S21, S12 and S22 S parameters. An optional GPIB interface is available for remote control of the analyser. The instrument comes in two models with frequency ranges from 1 MHz to 3 GHz (R&S ZNLE3) and to 6 GHz (R&S ZNLE6).

It offers RF performance with a wide dynamic range of typically 120 dB and measurement bandwidths from 1 Hz to 500 kHz. Measurement time is just 9.6 ms for 201 points at 100 kHz measurement bandwidth, for a 200 MHz span, with two-port TOSM/SOLT calibration.

For stable, repeatable measurements, the product produces low trace noise of typically 0.001 dB. It features a large 10.1″ WXGA touch screen, providing good visibility of all traces. The touch screen supports zooming in and out of traces using multitouch gestures. Context-sensitive help menus for the diverse functions and parameters facilitate interactive operation.

Rohde & Schwarz (Australia) Pty Ltd
www.rohde-schwarz.com.au

Welding helmet

The Speedglas Welding Helmet 9002NC has a streamlined profile, with high-performing Speedglas TrueView optics and a head harness made for increased comfort.

The Speedglas TrueView optics allow welders to view the weld pool and their general surroundings with a view that appears lighter, brighter and more realistic.

With a high optical rating (1/1/1), this large (55 x 107 mm) auto-darkening welding lens features shades 3/8-12 with arc detection down to 1 A. The Speedglas 9002NC is compliant with the relevant Australian and New Zealand standards and is suitable for MMAW, MIG/MAG, TIG and low amperage TIG.

The Speedglas 9002NC features exhaust vents that assist in removing exhaled air, keeping the welder more comfortable and the welding lens fog-free. At just 485 g and featuring an upgraded head harness with multiple adjustments for a customised fit, the Speedglas 9002NC is comfortable for all-day wear.

AWS Pty Ltd
www.awsi.com.au

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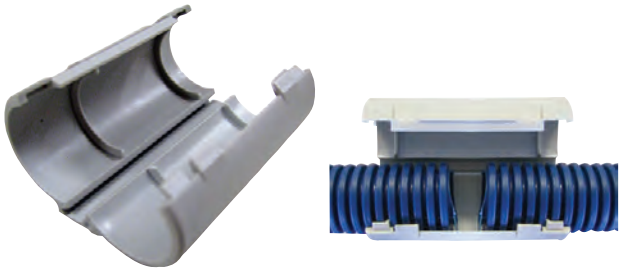

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Lighting up a multipurpose stadium

The new 60,000-seat Perth Stadium, set to open in early 2018, will feature more than 15,000 controllable LED light fittings.

The lighting system is designed and supplied by lighting company Philips Lighting. The venue showcases the Philips ArenaExperience capability. The centrepiece is the Philips ArenaVision LED pitch lighting system comprising LED floodlights and a control panel. This system can be synchronised with external lighting consoles for other types of light shows and events.

The stadium facade and roof canopy will be lit by Philips' Color Kinetics architectural LED lighting with connected LED light points that can be easily controlled. The roof canopy will act as a giant canvas on which spectacular light shows can be created with patterns and imagery via the connected light points. Philips Lighting also provided LED lighting for offices and hospitality areas inside the stadium.

The lighting system, managed through a control platform, offers the flexibility to create a multipurpose arena for fans to watch anything from their home football and cricket teams to world-famous rock concerts. Music and lighting can be merged together in advance by the lighting operator for seamless implementation, creating visually stunning pre-match light shows. In addition, the LED floodlights meet the requirements for HDTV broadcasting standards for sports lighting.

Chris Palandri, regional director for Multiplex, the stadium builder, said, "LED stadium lighting is an integral part of the plan to make Perth Stadium the premier multipurpose venue in not only Western Australia, but also the entire Southern Hemisphere. The lighting will be crucial to delivering an amazing fan experience whether it's for Australian Rules Football, cricket, a rock concert or for a completely different type of event. The stadium will represent a beacon for the entire community."

David Gardner, general manager, Philips Lighting ANZ, said, "On completion, this project will be Philips Lighting's largest complete LED stadium implementation in the world, and the largest LED multipurpose stadium lighting implementation of its type in the world. The scale of the project really demonstrates how seriously Australians take their sport and events. We at Philips Lighting are proud to install this world-class LED stadium lighting system together with Multiplex, the stadium builder, for the enjoyment of fans."

The stadium will be used for, amongst others, Australian Rules Football, cricket, rugby union and rugby league, soccer and entertainment events. It is scheduled to open in time for the start of the 2018 Australian Rules Football season. The facility will be serviced by a train and bus station, as well as a pedestrian bridge connection across the Swan River to the city centre.

Philips Lighting Pty Ltd
www.philips.com

silhouette
matt black

Back in Black

For those about to switch
We salute you

The NEW Matt Black silhouette range boasts a clean, modern design, and at only 4mm off the wall, has been crafted with distinctive elegance in mind. With the choice of standard switch mechanisms or our electronic push button switches and dimmers, silhouette brings a much needed fresh and stunning design to the Australian market.

hagerelectro.com.au/silhouette

:hager

DIGITAL TECHNOLOGY AND THE TRADIE TOOLBOX

Tim Phillips, General Manager, Drillcut

Like most other sectors, the electrical and construction industries are experiencing digital transformation. Deployed strategically, digital technology can help increase productivity and efficiency and mitigate risk and waste.

We're still using tools and still building a lot of things by hand so it can sometimes be a bit difficult to see the digital transformation at a worksite. Looking closely shows how a tradie's toolbox has changed and how it is set to change further in the near future. From general technologies such as smartphones to industry-specific innovations such as inventory management system and digital site plans, today's tradies are a lot more high-tech than their predecessors.

There has been an apparent reluctance to embrace new technologies in many parts of the electrical and construction industry, perhaps because of a fear that digitisation and automation will make a lot of jobs obsolete. However, digital technology is making everyone's job easier, both on- and off-site, and in some cases it's creating new jobs and even new industries.

Mobile phones have been around long enough to no longer be considered new and exciting, but they really have made a huge impact in the way we communicate, both on and off the job site. On a large project, it used to be that the only way to communicate was via two-way radio or sending someone from team to team, wasting time and leaving a lot of room for miscommunications and misunderstandings. These days, getting in touch is simpler and everyone is connected.

One of the biggest digital game changers has been the advent and increasing ubiquity of digital site plans. Technologies such as Autodesk's BIM (Building Information Modelling) allow access to the most up-to-date set of site plans to everyone who needs it without hassle and confusion. Where we once would have needed to print and store each new version, now everyone can access plans through their computer, tablet or phone. This also allows for tighter version control with all previous versions of the plans saved for reference. Digital site plans are also beginning to make it easier to accurately predict product requirements before a job starts. The program can precisely calculate the wiring and piping from the most current site plans, eliminating countless man-hours and dramatically reducing waste from extra product ordered 'just in case'.

Next-generation BIM programs are set to incorporate build schedules and costs so that project planning, design, construction, operations and maintenance are all brought together. One of the many advantages of this type of innovation is the ability for the site manager to accurately predict the impact of a proposed design change on the build schedule and budget so that different options can be objectively analysed and understood.

At Drillcut we've embraced digital technology in a variety of ways. Our product line-up now includes Milwaukee ONE-KEY, a digital platform for managing tools and equipment, and Milwaukee TICK, the first tracking device built for the job site. The platform lets a site manager monitor and control equipment, regardless of whether they are on the tools themselves. The site manager can monitor the output of tools and ensure they're all correctly configured for the job at hand. For example, the speed and torque level of a drill can be controlled through the platform so that it is at the right level for the day's tasks.

It's estimated that around 5–10% of inventory is lost or stolen each year so digital technology that allows you to keep track of it could be well worth the investment. These products are a great example of digital technology enhancing our current processes and working environment. They represent a move towards the 'internet of things', making ordinary tools and appliances 'intelligent'. Just like a personal fitness tracker can tell you how many steps you've taken or how well you slept, wireless sensors incorporated into tools and equipment can let us know that everything is running smoothly and alert us to issues before they become major setbacks.

"IT'S ESTIMATED THAT AROUND 5–10% OF INVENTORY IS LOST OR STOLEN EACH YEAR SO DIGITAL TECHNOLOGY THAT ALLOWS YOU TO KEEP TRACK OF IT COULD BE WELL WORTH THE INVESTMENT.

Technologies such as 3D printing and digital laser cutting are also beginning to make waves in the industry. Most large-scale 3D printing is currently cost prohibitive, but costs are starting to come down and creative engineers and designers are always working on new innovations. Who knows, one day we might all be printing build components to order right on the job site. Looking to the future, we can only make an educated guess about how digital technology will change the tradie's toolbox. As our buildings become smarter and future-ready, we have to be too.

Digital inventory management and site plan programs are in their infancy and only just beginning to become widely adopted across the industry. As these technologies become more common and are tweaked, updated and incorporate new innovations, it is likely that digital understanding and capability will become even more important than it is today.

Drillcut
www.drillcut.com.au

UPS for large data centres

Schneider Electric's Galaxy VX uninterruptible power supply (UPS) is suitable for mid-to-large and hyperscale data centres. The solution's extended power ranges, available from 500 to 1500 kW, answer the need for high availability by providing complete, versatile power support for a diverse data centre market.

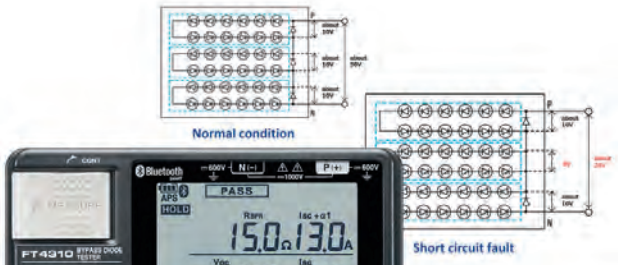
The solution features a modular, distributed-component design that scales power system redundancy and capacity through incremental 250 kW per unit power cabinets. Additionally, by featuring two I/O cabinets, Galaxy VX eliminates the need to change the I/O cabinet when upscaling the power rating, enabling power cabinet internal redundancy. This architecture is said to enhance overall system reliability, reduce mean time to repair (MTTR) and enable higher levels of protection and fault tolerance.

The UPS is fully managed through Schneider Electric's StruxureOn cloud-based remote monitoring as an integrated suite of data centre infrastructure management (DCIM) applications. It enables businesses to prosper by managing their data centres across multiple domains, providing actionable intelligence for a balance of high availability and peak efficiency. The UPS is available with flexible battery storage options, including lithium-ion.

For certain installations, the UPS is available as part of a prefabricated power skid architecture to simplify UPS deployment and installation. The pre-assembled and pre-tested system incorporates the UPS and all major components of the data centre electrical infrastructure, including batteries, automatic transfer switch (ATS) and switchgear, to minimise installation time and errors on-site.

Schneider Electric

www.schneider-electric.com.au



Bypass diode tester

The Hioki FT4310 bypass diode tester can be used safely in broad daylight, detecting open and short-circuited bypass diodes, as well as measuring cell string losses.

The FT4310 is Bluetooth compatible, transferring data wirelessly (available for Android and iOS devices).

Failure of bypass diodes frequently goes undetected until the affected panel is in shadow. All testing is conveniently done at the combiner box. Bypass diodes prevent excessive reverse bias on cells that have failed. This failure can cause severe overheating.

The instrument's comparator function can be used to compare measured values to a previously set value to generate pass and fail judgements, making it easier to discover anomalies. Measured values held on the display are sent immediately to a smartphone or tablet via Bluetooth Smart technology.

Power Parameters

www.parameters.com.au

Stackable managed gigabit switches

D-Link ANZ's DGS-3630 series next-generation Layer 2+/Layer 3 managed gigabit switches come with advanced software features and a lifetime warranty.

With 10/100/1000 RJ45 ports, Gigabit SFP ports, 10 GbE SFP+ ports, advanced security features and advanced quality of service (QoS), the switches can operate in the core, distribution or access layer of the network. High port densities, switch stacking and easy management make the switches suitable for a variety of applications in business networks of all sizes.

There are currently three ANZ models available in the DGS-3630 series including the DGS-3630-28TC (28-port gigabit xStack Layer 3+ managed stackable switch with 24 1000Base-T (4 Combo SFP) and 4 10 GbE SFP+ ports), the DGS-3630-28SC (28-port gigabit xStack Layer 3+ managed stackable switch with 24 SFP (4 Combo 1000Base-T) and 4 10 GbE SFP+ Ports) and the DGS-3630-52TC (52-port gigabit xStack Layer 3+ managed stackable switch with 48 1000Base-T and 4 10 GbE SFP+ ports).

The DGS-3630 series switches include the standard image (SI) software, supporting essential SMB and SME functionality, such as L2 switching, entry-level routing, L2 multicast, advanced QoS, operations, administration and maintenance (OAM), and robust security features. For additional functionality, the switches can be upgraded to enhanced image (EI) software using separately ordered licence upgrades. The EI adds support for full L3 routing for enterprise integration, including OSPF, BGP, VRF-Lite and L3 multicast.

Copper (RJ45) and fibre (SFP) versions are available, and all models support four 10-gigabit SFP+ ports, which can be used for uplinks or for stacking. For out-of-band CLI management, network administrators can use either a conventional RJ45 or mini-USB console port. The switch also has a USB port that can be used to store logs, configuration and firmware images.

D-Link Australia Pty Ltd

www.dlink.com.au

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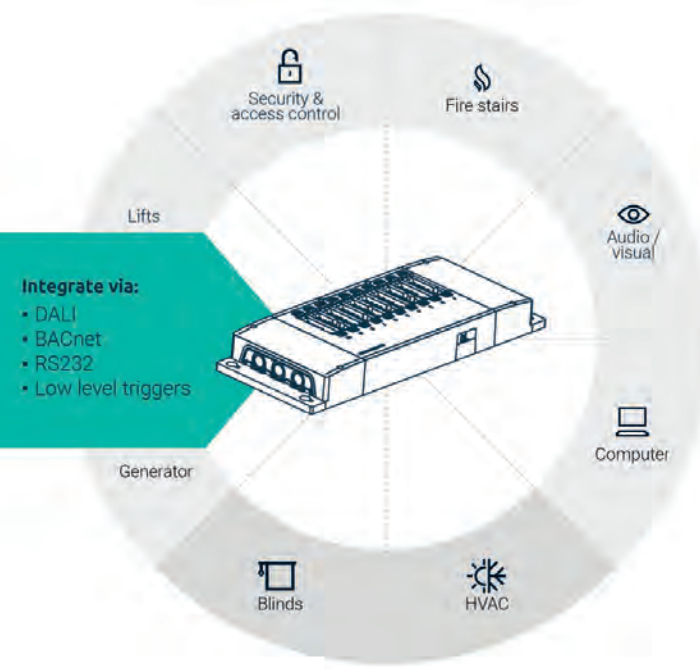

Lighting control systems

zencontrol's lighting control systems are designed to address the problems faced by installers, reduce set-up time and improve fault identification.

Using smart technology, zencontrol automates all the tasks that used to be manual. It is a 'plug and play' solution that easily integrates numerous building services including HVAC, AV, lights, sensors, blinds and security to name just a few.

Built from the ground up, and based on the latest DALI version 2 standard, zencontrol provides seamless integration between devices in the network. With zencontrol's new room controller, a base build installation can be achieved without the use of a computer, laptop or programmer. Simple out-of-the-box set-up and automatic fault recovery keeps the rooms running automatically.

zencontrol is also designed to target cybersecurity risk and uses the industry-proven TLS 1.2. It enables building owners to: reduce the costs associated with energy consumption; quickly and efficiently monitor and control multiple sites remotely using cloud control; manage and maintain emergency lighting in small tenancies, as well as the entire building; reduce costs, increase speed and remove the risk of a single point of failure through the installation of a single controller.

The systems are said to transform the way installers and users interact with their buildings.

Evolt

www.evolt.com.au

Slim switches and sockets

Hager's Matt Black silhouette range of slim switches and sockets features a clean and modern design.

The range has a thickness of only 4 mm from the wall. With the choice of standard switch mechanisms or electronic push-button switches and dimmers, the range brings a fresh design to the local market.

Hager Electro Pty Ltd

www.hagerelectro.com.au

Cables with small bend radii

The igus chainflex series CF298 and CF299 cables are particularly suitable for confined spaces.

Dynamic applications with small bend radii can quickly allow the copper cores of conventional cables to meet their mechanical stress limits. The CF298 (unshielded) and the CF299 (shielded) cables have been tested intensively and have qualified for small bend radii down to 4xd in continuous motion. This is made possible by the combination of a high-performance alloy conductor material and a flexible igus TPE outer jacket, which prevents cracks and breaks. The jacket material additionally offers high abrasion resistance in combination with energy chains from igus.

The data cables are suitable for short, quick movements, eg, in pick-and-place machines or other fast handling applications. They are also suitable for both indoor and outdoor applications due to their resistance to UV, low temperature and oil. As the cables are certified to ISO Class 1, they can be used in cleanrooms.

The cables are designed for up to 40 million double strokes in e-chains. As a result, igus guarantees a life of 36 months, as for all chainflex cables. The CF298 and CF299 are available with various number of cores and conductor nominal cross-sections.

Treotham Automation Pty Ltd

www.treotham.com.au

All-Energy Australia's conference agenda announced

Delegates can start planning their schedules for the country's most comprehensive clean and renewable event, with the announcement of All-Energy Australia's conference agenda. A line-up of more than 120 world-class speakers will deliver two days of presentations across a six-stream conference program. Some of the industry's most respected sector leaders will unite under one roof, sharing their expertise, insights and projections on the evolving energy landscape.

The conference program will cover the latest government initiatives, smart grid power systems, project development in wind, solar and bioenergy, electric vehicles, energy storage and efficiency, new technologies and more.

All-Energy Australia Exhibition director, Robby Clark, said that All-Energy Australia will set the stage for further growth and prosperity for the clean and renewable energy industry.

"With so many sector leaders under one roof, this event will highlight the ways in which our energy sector is tackling the future, balancing the needs for clean, efficient renewable energy with practical demands for constant supply," said Mr Clark.

Mr Clark said this year's conference program has been adapted to reflect the rapid evolution of the energy industry.

For the first time, sustainable transport and electric vehicles will form part of the All-Energy Australia program. Electric Vehicle Council chair, Behyad Jafari, and AGL's electric vehicles manager, Kristian Handberg, will be among the industry experts exploring policy and government support for electric vehicles, as well as the infrastructure needs and new standards required to drive on Australia roads.

Technical Insight Pty Ltd's director Dr Robert White will explain the potential of bio energy; the development of waste heat to power. Many industrial processes continuously emit low-grade heat into the environment and this type of technology can generate electricity around the clock. Dr White will introduce the technology and provide examples of where it is used around the world.

Hydrogen Utility (H2U) CEO and co-founder, Attilio Pigneri, will share his forecast for future Australian hydrogen projects. H2U has developed a roll-out program for the establishment of 14 commercial-scale hydrogen refuelling stations, from 2016 to 2019.

KPMG's head of clean energy, Dmitry Danilovich, will chair a three-part presentation on the future of energy storage trends. Contributing speakers include Smart Commercial Solar founder Huon Hoogesteger, Tesla Energy's head of business development, Lara Olsen, and EOS Energy Storage's vice president of business development and marketing, Philippe Bouchard.

Budding project developers can learn what it takes to get a new renewable energy project up and running by hearing from the personal experiences of sectoral leaders in the field.

Partner at Mills Oakley, Mick Coleman, will give delegates the benefit of his project development experience, from building and selling a Solar Farm — the Barcaldine project.

Entrepreneur and the innovator behind Blue IoT and Entrepreneur's Angels, Bob Sharon, will challenge the traditional procurement model for new buildings and major refurbishment projects, offering alternative solutions in their place.

Renewable Energy Systems Australia's communications and company services manager, Tanya Jackson, and economist John Noronha — key members of the team behind the 240MW Ararat wind farm — will outline their strategies for tackling this project.

The opening plenary on the first day of the event will include a ministerial welcome by Victoria's Energy and Environment MP Lily D'Ambrosio, followed by a keynote presentation by renewable energy revolution advocate and new Australian Energy Market Operator chief executive, Audrey Zibelman.

Clean Energy Finance Corporation's newly appointed chief executive, Ian Learmonth, will headline the second day's proceedings. Mr Learmonth will provide an insight into the current state of clean energy investment in Australia and the renewable energy investment boom driven by the 2020 Renewable Energy Target.

To make the most of their time onsite, delegates can register their product of interest with the All-Energy Australia Business Matching Program. The All-Energy Australia Business Matching Program is a service that enables visitors to create a tailored conference itinerary based on preferred topics, in addition to favoured products and suppliers.

Delegates can apply for the All-Energy Australia Business Matching Program online, as part of the registration process for All-Energy Australia. Existing registration can also be updated to include participation in the Business Matching Program by emailing allenergy@infosalons.com.au.

EVENT DETAILS

All-Energy Australia Conference and Exhibition
11–12 October 2017
Melbourne Convention and Exhibition Centre

All-Energy Australia is a free-to-attend trade show and conference.

To access the 2017 program and register for free, please visit the All-Energy Australia website: www.all-energy.com.au.

For more information about the program or exhibitors, please contact Cristina Natoli, Porter Novelli Melbourne, (03) 9289 9555, cnatoli@porternovelli.com.au

Reed Exhibitions
www.reedexhibitions.com.au/

Outdoor motion-activated security camera

The Ring Floodlight Cam is an outdoor motion-activated security camera with built-in floodlights, an HD camera, a 110 dB siren alarm and two-way audio.

The camera is a hardwired device that, alongside the Ring Video Doorbell, extends the ring of security from the front door to other critical areas around the home.

With object and facial detection, the camera has advanced motion sensors in home security. Its 270° field of view will let users detect motion around corners and monitor all blind spots. Features include: dual sensors with object and facial detection; ultrawide-angle motion sensors; customisable motion zones and scheduling; and floodlights.

The camera easily replaces existing wired floodlights and connects to standard junction boxes.

Ring of Security
www.ring.com

Wall-mount enclosures

NHP's Eldon ASR 316L stainless steel wall-mount enclosures are available in a range of sizes with key accessories such as rain hoods, inner doors and depth adjustment kits.

The ASR range is designed to suit the harshest weather conditions, with certification to impact rating of IK10 and high-pressure water jets from all angles with IP66 ingress protection.

Features include: a silicone enclosure seal with almost zero water absorption, a wide temperature range and better chemical resistance than standard PUR (polyurethane) gaskets; a high-cleanliness design without gland plates or pre-existing mounting holes for a smooth finish; mounting plate marked in 10 mm increments for ease of component placement and reduced installation time; cross compatibility with accessories from the existing mild steel range, reducing stocking requirements; multiple earthing studs to simplify wiring and save time; and availability in both single-door (ASR) and double-door (ADR) versions.

The enclosures are particularly suitable for food and beverage applications where ease of cleaning is paramount. The range is also supported by a strong local stock holding to ensure the good delivery times to suit user requirements.

NHP Electrical Engineering Products Pty Ltd
www.nhp.com.au

LACK OF POLICY DRIVING INVESTMENTS AWAY

One of the world's largest automation and technology groups, ABB, has blamed lack of policy direction around renewables for discouraging investment in the sector.

The group is working on a number of renewables and storage projects in Australia but remains concerned about the future of the industry. The lack of national energy policy is keeping the billions of dollars that are being invested in other parts of the world from getting invested in Australia, said ABB Australia Sales and Marketing Manager, Power Grids Bill Strohecker on the sidelines of ABB's recent Digital Transformation Summit in Brisbane. The summit highlighted how businesses in asset-intensive industries like utilities, mining, oil and gas and transport are preparing for and responding to the digital age, both in terms of seizing the opportunities of digitalisation, big data and artificial intelligence, as well as mitigating the risks. Cybersecurity and business transformation to emerging technologies such as microgrids and battery energy storage systems, along with digital substations and their impact on grid stability and asset management were some of the topics covered at the event.

Strohecker is concerned that Australia is a leader in a number of fields but still doesn't have a national energy policy. ABB has representation on the Clean Energy Council; is proactive through CEDA and Al Group, and is also involved in discussions with the government on the present and future of the industry.

While the lack of policy presents challenges, the group has been strengthening its renewables offering to facilitate growth. In 2011, ABB acquired Powercorp, an Australian renewable power automation company to strengthen its portfolio of control technologies for managing the integration of renewable energy sources.

The group's products division is still a major revenue contributor, but the share of the service and software portfolio is gradually increasing.

In late 2016, ABB launched Stage 3 of its Next Level strategy to unlock value for customers and shareholders. This included: shaping ABB's divisions into four units: Electrification Products, Robotics and Motion, Industrial Automation and Power Grids. These divisions were effective 1 January 2017 and are fully operational.

ABB's traditional markets such as utility/heavy industries and power transmission and distribution continue to remain lucrative, but the group is now witnessing significant growth in non-traditional markets, such as food and beverages, data centres and renewables. ABB Australia Managing Director Tauno Heinola, who has spent 33 years with the group, was appointed MD of the group's Australian operations in September 2016. He said food and beverages is a major industry in Australia and the group has strengthened its focus on that industry in recent years.

In the food and beverages market, ABB offers a range of segment-specific products, solutions and services for diverse processing and packaging needs across the industry.

Similarly, as the global dependence on data continues to rise, ABB continues to use its industrial heritage and electrification and automation solutions portfolio to help businesses meet their data demands, offering products and solutions for power distribution, intelligent grid connections, critical power and infrastructure management.

Data centres require a lot of power, electrical equipment and automation systems and that's where ABB plays a major role — the group offers a range of solutions and systems for the entire life cycle of a data centre. ABB's data centre solutions include: intelligent grid connection; electrification solutions; industrial automation and DCIM, amongst others.

The group is seeing strong growth in the data centre market around the world, a trend which is also reflected in Australia. It's a significant market, said Heinola.

Compared to the other markets Heinola has worked in, the Australian market is relatively small — this presents a unique set of challenges. The domestic market is not very big and the export markets are geographically far from Australia; and what is even more challenging is that the closest export markets are low-cost countries, said Heinola. The other challenge is high manufacturing costs and declining manufacturing industry.

While the group faces enormous challenges, there are also opportunities, pointed out Bill Strohecker. ABB has a substantial footprint of service operations in Australia and still manufactures in the local market. The group has two manufacturing sites in Australia and also operates three major motor/generator repair centres. Strohecker said that one of the other areas where the ABB business has transformed over the years is in software. ABB has software development divisions in Darwin and Brisbane. The group is involved in developing substantial software solutions in Australia for the global market.

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- **Dr David Lund** — Coordinator of BroadMap/Board Member – Public Safety Communications ***(Europe)***
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OPINION

How to protect against ransomware

The world's largest ransomware attack affected tens of thousands of computers — but was it preventable? NordVPN lists simple strategies to protect yourself from ransomware.

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The recent attack affected over 40 health service trusts and FedEx's offices in the United Kingdom, a telecom in Spain and the Russian Interior Ministry.

The malicious software, transferred over email and stolen from the National Security Agency (NSA), exposed vulnerabilities in computer systems in almost 100 countries in total, constituting one of the largest ransomware attacks on record.

The attack was in fact largely preventable, if only more Windows users had installed the critical security patch that Microsoft released for it two months ago and followed a few other security rules.

"Criminals took advantage of the fact that most people still don't do enough to protect their computers," said Marty P Kamden, CMO of NordVPN (Virtual Private Network). "We at NordVPN strive to raise public awareness about what each person could do to protect their data."

Below are seven simple strategies to prevent attacks:

1. **Install latest security updates:** Security updates often contain patches for latest vulnerabilities, which hackers are looking to exploit.
2. **Don't open anything suspicious you get through email:** Delete dubious emails from your bank, ISP, credit card company etc. Never click on any links or attachments in emails you're not expecting. Never give your personal details if asked via email.
3. **Back up all data:** Back up your data in an alternate device and keep it unplugged and stored away. Backing up data regularly is the best way to protect yourself from ransomware because only unique information is valuable.
4. **Close pop-up windows safely:** Ransomware developers often use pop-up windows that warn you of some kind of malware. Don't click on the window — instead, close it with a keyboard command or by clicking on your taskbar.
5. **Use strong passwords and a password manager:** Perhaps the most basic requirement for any online account set-up is using strong passwords, and choosing different passwords for different accounts. Weak passwords make it simple for hackers to break into an account. A strong password has a minimum of 12 characters and includes a strong mix of letters, numbers and characters. It's not easy to remember strong passwords for each site, so it's recommended to use a password manager, such as truekey.com, LastPass and 1Password.
6. **Use a VPN for additional safety:** Using a VPN when browsing can protect you against malware that targets online access points. That's especially relevant when using a public hotspot. However, keep in mind that a VPN cannot protect you from downloading malware. While a VPN encrypts your activity online, you should be careful when downloading and opening certain files or links.
7. **Use antivirus programs:** Make sure you have installed one of the latest reputable antivirus programs to make sure you are fully protected.

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