

# Winter 2016



## Energy storage interview: Graham Kenyon

*Director and Principal Consultant at G Kenyon Technology Ltd, Graham has established his reputation designing and implementing control and information management systems in the challenging environments presented by world-class construction programmes in the airport & railway industries. He serves on the IET's Wiring Regulations Policy Committee and CIBSE's Electrical Services Group Committee, and as Deputy Chair of Panel D of JPEL/64 (BS 7671, IET Wiring Regulations).*

*Graham is co-author of the forthcoming IET Code of Practice for Electrical Energy Storage Systems, and author of the recently published IET Technical Briefing Electrical Energy Storage: An Introduction.*

*We interview Graham to find out more about the energy storage market, developments in this area and the skills and experience electricians might need to work with energy storage installations.*



### **What is the current maximum battery capacity?**

Estimates of current levels of dedicated energy storage batteries range between 20 MW and 30 MW. Some reports have predictions that this could increase to above 1.5 GW by 2020, and conclude that energy storage is likely to see significant growth in the next few years.

### **Is this technology likely to be driven by non-domestic users first?**

The technology is being driven in a number of ways, and research into storage systems is occurring for a number of reasons. Excluding mobile device technology, perhaps the biggest driver for development in battery storage at the moment comes from the automotive traction arena. However, the benefits of energy storage for various applications are already being realised with very large storage systems embedded in the grid, for reasons ranging from support of renewable generation technologies, to deferral of upgrades to networks as local demand peaks increase.

**Do you believe this technology will drive the solar PV and other alternative energy markets?**

It's probably true to say that there is a symbiosis of the energy storage and alternative energy markets. Renewable resources do not provide a constant stream of generation over a day, and their output may be seasonal. For example, solar PV provides its average highest output in the summer months and lowest in winter, because of both the number of daily sunlight hours, and the angle of the sun at the time of year. Energy storage can help optimise and maximise the more efficient utilisation of renewable resources.

**What do domestic consumers need to be aware of before having an energy storage system installed? Will such consumers require much education once the storage system is installed?**

The key awareness for consumers is:

- particularly where the system is used in conjunction with renewable generation systems, the selection of the system must be carefully analysed to ensure that any perceived benefits will be achieved, particularly where the system is required to optimise energy tariffs. The system must be compatible with renewable generation in the installation.
- where the system is intended to supply stored energy in the event of grid power being lost, there are limits as to the loads that can be serviced in this mode. For example, operation of electric showers, ovens, hobs etc. would be mostly impracticable, and the loads would be limited to very small power ones, such as energy efficient lighting, and certain other electronic devices. This type of system is likely to require installation of additional earth electrodes where there are none present in the installation, or where the earth electrodes that are present do not meet the needs of the energy storage system.
- energy storage systems require maintenance:
  - batteries have a limit to their usable life and will need to be replaced or refurbished in accordance with the manufacturer's instructions.
  - the load profile of the installation may change over time, and the system may require 'tuning' to ensure the users get the optimal benefit for the installation.

Overall, the above would be considered by a reputable, competent contractor.

**How easy is it for an electrician to install an energy storage device – is specialist training required?**

This depends on the design of the system, and how it is intended to operate. Packaged systems require less specialist knowledge, particularly where comprehensive installation and commissioning information is provided.

Skills and knowledge required to install electrical energy storage systems are addressed in the forthcoming IET *Code of Practice for Electrical Energy Storage Systems*, and may include:

- awareness of relevant battery types, safe battery installation, transportation, maintenance and disposal.

- safety and Building Regulations requirements for the safe location of components of the storage system.
- knowledge of the legislation and industry practices for embedded generation systems, and generators operating both in parallel with the grid, and as a switched alternative to the grid.
- awareness of the limitations of energy storage systems operating in island mode (i.e. as a switched alternative to the grid supply), relevant safety provisions, and the need for load shedding.

Where systems are installed in conjunction with solar PV or wind systems taking advantage of the Feed-In Tariff (FIT), MCS certification [*microgeneration certification scheme – visit <http://www.microgenerationcertification.org/consumers/finance-incentives/fits> to find out more*] will be required.

The provision of a new electrical energy storage system (EESS) in dwellings will often require new circuits, or changing protective devices, and in these cases the work is generally notifiable under the applicable Building Regulations. See the relevant Approved Documents (England & Wales) and Technical Standards (Scotland) for further details.

It is anticipated that training providers will make relevant courses available once the IET *Code of Practice for Electrical Energy Storage Systems* is published. Before then, manufacturers training and information should be consulted, along with the relevant parts of BS 7671 and related guidance.

### **What safety precautions are required with regards to the installation and maintenance of Lithium batteries used for energy storage?**

Any energy storage medium has the property that, if there is a fault or failure of some kind, the release of energy may be extremely violent. With batteries, if they are charged in the wrong way, this may cause faults which may be caused by overheating or not managing the temperature. These faults change the physical or chemical arrangement in the cells of the battery, and release the stored energy. This is the case with most raw battery technologies, but methods have been developed in their manufacture, and in related charging and discharging control circuits, which permit their widespread use.

Certain Lithium battery types have come under scrutiny because of the way in which they can fail, causing thermal runaway, which may, dramatically, lead to fire, or burns with a hand-held device. The prevalence of Lithium batteries in an extremely large population of portable consumer products has brought the battery technology much media attention. Since such portable consumer products are designed to be ever smaller, the issue of managing heat within the batteries is a key consideration for designers and manufacturers. Learning from advances in the portable consumer electronics market, Lithium batteries from reputable manufacturers, which are intended for energy storage applications in electrical installations, should incorporate control and protection mechanisms within the battery itself.

All battery technologies require a charger compatible with the battery, and many of these additionally incorporate thermal monitoring.

The location of all batteries to take into account a more stable ambient temperature for charging and storage is extremely important, as extremes of temperature can impact the storage capacity and usable life of batteries. Certain battery technologies are must be located or adequately enclosed to ensure they are not exposed to water.

## How much space does an energy storage device require?

The amount of space required depends on the storage capacity, power delivery rating of the system, and whether it is pre-packaged as a single manufactured unit, or a bespoke-designed system. It is anticipated that the smaller systems would typically be found in installations related to dwellings, with larger ones in commercial, industrial, infrastructure and grid-support applications.

At the smaller end of the scale, self-contained, complete, stand-alone units, suitable for wall-mounting in a garage in a domestic installation are already available. Vastly larger systems are already operating in industrial sites, or embedded in the Grid.

## Domestic electrical supplies to hot tubs

*In this article, Geoff Cronshaw takes a brief look at the requirements for electrical supplies to hot tubs, and considers the requirements of Part P of the Building Regulations for domestic electrical work in England only. Details of how to get information on the requirements of the Building Regulations for Scotland, Wales, and Northern Ireland are provided at the end of this article.*

### General

All electrical work should comply with BS 7671. There are no specific requirements for electrical installations associated with hot tubs in BS 7671. However, where a hot tub is located outdoors in the open air, for example a garden, IET Guidance Note 7 *Special Locations* recommends that the requirements of Section 702 (swimming pools and other basins) should be applied. The requirements for swimming pools are given in Section 702 of BS 7671:2008+A3:2015. IET Guidance Note 7 also sets out the risks. Persons involved in the design of the electrical installation for a hot tub should consult the product standard BS EN 60335-2-60: *Specification for safety of household and similar appliances: Particular requirements for whirlpool baths and whirlpool spas*.



### Supply

The supply to the hot tub should be protected by a 30 mA RCD. The cable must also be suitably protected along its route. Regulation 522.8.10 sets out the requirements for buried cables. Cables should be protected against foreseeable damage, either by armouring or by suitable enclosure. Unprotected cables should not be buried directly in the ground, nor should they be clipped to wooden fences etc., as such an arrangement may provide inadequate support and protection.



Problems arise when ground levels are either lowered so that cables have insufficient cover, or raised so that cables that were not intended to be buried and are not suitable for burial become buried. Such problems can arise during the course of a project and the intended ground level should be formally ascertained before the cables are installed. It must be remembered that the layout of a garden can be changed totally within a few seasons and great care must be taken to route cables where they are not likely to be disturbed or damaged, for example, around the edge of the plot and at sufficient depth.

Buried cable routes should be identified by local route markers and recorded on drawings. Cables should be buried at least 500 mm below the lowest local ground level, and a route marker tape laid along the cable route about 150 mm below the surface.

NOTE: BS EN 61386-24 is the standard for underground conduits.

### **Additions and alterations to an existing installation**

Where work is being carried out to an existing installation, Regulation 132.16 requires that the rating and condition of existing equipment, including that of the distributor, should be adequate for the additional load and that the existing earthing and bonding arrangements are also adequate.

### **Inspection, testing and certification**

Inspection and testing must be performed to confirm the adequacy of the relevant parts of the existing installation that will support the changed requirements, the upgrading of the existing installation necessary to support the addition or alteration, and the addition or alteration itself. The requirements for initial verification are contained in Part 6 of BS 7671 and further information on the requirements for inspection and testing is given in Guidance Note 3: *Inspection & Testing*.

Compliance with BS 7671 must be verified for every addition or alteration. Requirements for certification and reporting in respect of electrical installations are also given in Part 6. An Electrical Installation Certificate must be provided to the person ordering the work, and should give the details of the extent of the installation covered by the certificate, together with a record of the inspection and the results of the testing.

### **Part P of the Building Regulations**

Anyone carrying out domestic electrical installation work in England must carry it out in line with Part P of the Building Regulations. Where work is notifiable (new circuits, the replacement of a consumer unit, and any addition or alteration to an existing circuit in a special location) it must be certificated by:

- a member of a competent person self-certification scheme; or
- (before work begins) an installer who is not a registered competent person may appoint a registered third party certifier to inspect and test the work; or
- (before work begins) the work must be notified to the local authority, which will then be responsible for inspecting and testing it for electrical safety.

The building control body will determine the extent of inspection and testing needed for it to be established that the work is safe, based on the type of work and competence of the installer. This may affect the fee payable to building control.

Where notifiable work is certificated by an installer who is member of a competent person self-certification scheme, the installer or the installer's registration body must give a copy of the Building Regulations compliance certificate to the occupier and the certificate or a copy of the information on the certificate to the building control body.

Where certification is by a registered third party (subject to inspection and testing being satisfactory), the third party certifier should then issue a condition report to the person ordering the work. The registration body of the third party certifier must give a copy of the Building Regulations compliance certificate to the occupier and the certificate or a copy of the information on the certificate to the building control body.

Where an installer is not a registered competent person and has not appointed a registered third party certifier (before work begins), the installer must notify a building control body.

All work, whether it is notifiable or non-notifiable, should be designed, installed, inspected, tested and certified in accordance with BS 7671.

## Further information

### **AMDEA - the Association of Manufacturers of Domestic Appliances**

Association of Manufacturers of Domestic Appliances

Registered Office: Rapier House, 40-46 Lambs Conduit Street, London, WC1N 3NW.

### **BISHTA**

4 Eastgate House East Street Andover Hampshire SP10 1EP

Telephone 01264 356211

email: [admin@bishta.co.uk](mailto:admin@bishta.co.uk)

## For further information on the Building Regulations:

England and Wales - The Department of Communities and Local Government [www.communities.gov.uk](http://www.communities.gov.uk)

Scotland - The Scottish Building Standards Agency [www.sbsa.gov.uk](http://www.sbsa.gov.uk)

Northern Ireland - <http://www.buildingcontrol-ni.com/regulations>

Important Note: This article is only a brief overview of the topic. For more information please refer to BS 7671:2008+A3:2015 and the manufacturer of the hot tub. It is important to consult the Building Regulations in the UK when designing electrical installations.



## Interview with the Electric Heating Company

*Wiring Matters interviews the Electric Heating Company (EHC) about the current market and smart home technology.*

### **What trends have you identified?**

Considering the electric heating and hot water market only, the main trend EHC has identified with regards to smart home technology is that it has been somewhat confused with the smart metering technology that the UK Government have been rolling out. Despite the name, smart meters do not allow a homeowner to control their heating or hot water system. Smart meters will only provide automatic meter readings to energy suppliers and show how much electricity a homeowner is using.

Smart home technology will do this but also allow a homeowner to control when their heating or hot water system operates and how it operates.

It also appears that the delays with the roll out of smart metering technology by the UK Government have unfortunately had a negative impact on consumer's confidence and trust in smart home technology.

### **What trends haven't panned out as you thought, and why?**

The main trend which hasn't panned out as thought is that smart home technology has been slower to take off than initially anticipated. Homeowners have been slow to purchase and install smart home technology. EHC are unsure if this is down to the cost of some of the technologies or the fear factor of adopting a new technology that the homeowner might think is unproven.

### **What is the market like for smart apps on top of technology – for example, do you sell more electric heaters that come with remote access?**

EHC are of the view the future is smart home technology, however, we have been surprised at the slow movement by homeowners towards to this technology. The EHC ecoSave electric radiator range which has remote access capability accounts for approximately 20 % of EHC electric radiator sales. However, only 10 % of homeowners who purchase the EHC ecoSave electric radiator are then downloading the free smart app offered with these electric radiators to provide remote access.

EHC are confident that smart home technology will continue to grow and we are therefore expanding our range of electric radiators with WiFi capability. EHC are now also able to offer our premium EHC German electric radiators with remote access capability.

### **What are the barriers to smart homes?**

The barriers to smart home technology can be varied. Some reasons EHC are aware of for homeowners not considering smart home technology are:

- the initial costs of some smart home technology is a deterrent to the homeowner;
- security of software used (concern about who could access and use the information the customer provides through the technology); and

- homeowners not fully understanding just what the smart technology can do and the benefits it can provide.

**How much thought does a homeowner need to apply to the platform that they are going to use for their smart home before they purchase technology?**

EHC recommend that, before a homeowner purchases any product, the homeowner gives careful consideration to their heating or hot water requirements, how the smart technology they are considering could help meet these requirements and the initial and ongoing cost of any such smart technology. It is possible in some circumstances the smart technology might not be suitable for the homeowner. Where possible, EHC will educate the homeowner on how the technology works before they purchase it. If that is not possible, EHC will provide an after sales service to ensure the homeowner can set up and operate the technology as desired.

**How do installers go about learning to work with your products?**

In the first instance, EHC recommend that installers carefully read the instruction manual for the relevant product being installed. If the installer is a member of the IET they should be of a sufficient competency level to understand the installation manual. For complex or large projects EHC can support the installer by offering a site visit or a specialised training to take them through their first installation of the product. For all installers, irrespective of product or project size, EHC provide over the phone telephone support for installation and maintenance purposes.

EHC maintain a list of accredited installers. For these accredited installers EHC will keep them up to date on new products, training or other materials, which can assist them in learning how our products operate and how to install and maintain our products. EHC provide regular mailshots for accredited installers, which focus on a specific product and provide the installer with learning material on that product.

Finally, EHC have a comprehensive library of training and support videos across all products that can be provided to installers and consumers if required. In particular, our WiFi-ready EHC ecoSave electric radiator has a comprehensive video guiding the installer through the initial set up of the radiator and app and demonstrating how the app can then be used for ongoing operation of the radiator.

**You are trialling electric radiators powered by solar PV panels. Is there a big solar PV market already established, or is this a product you expect to grow over time?**

EHC are not solar PV specialists and therefore our knowledge of this market is based on information from third parties we are working with who operate in or have good knowledge of this market. It is our understanding that there are in excess of 850,000 homes with solar PV installations. Whilst the solar PV market has declined over the past 12 months due to changes in the Feed-In Tariff scheme operated by the UK Government, we understand there are still approximately 4,000 new solar PV installations being completed monthly across the UK.

We believe sales of our solar PV-ready electric radiators will grow once we have completed our trials and proved the benefits these solar PV-ready electric radiators can provide. Our primary target market for these solar PV-ready electric radiators is homeowners who have solar PV already installed and are now looking to increase self-consumption.

The initial data from our solar PV-ready electric radiator trials show these specially adapted radiators can provide a variety of benefits to homeowners. The trial data provided so far shows:

- an increase in the self-consumption of solar PV generation by the homeowner;
- environmental benefits through CO<sub>2</sub> savings;
- possible cost savings to the customer due to a higher background heat in their home, meaning their existing heating system does not need to work as hard to reach their desired room temperature; and
- possible health benefits to the elderly through a higher background heat in the rooms they occupy frequently and might not otherwise have been able to afford to heat throughout the day.

The data from these trials will be analysed by an independent specialist company who will prepare a report on the benefits of the solar PV electric radiators and compare these benefits to other heating systems. This report will be made readily available to any installer or customer who wishes to fully understand the benefits these radiators can provide.

## Backstage at the theatre: what it takes to power a show

In the Autumn issue of *Wiring Matters*, ABTT member James Eade caught up with Nick Mumford, Martin Chisnall, Pete Lambert and Robin Barton to talk about their [experiences in theatre](#). In this issue, he chats to them about their best and worst memories, and their advice to those who want to work in theatre.

### Memories are made of these...

Sometimes work throws up some memorable events and we asked what ones stuck out in the minds of the four. For Robin:

“This is always a difficult question to answer as most shows are memorable for a variety of reasons; the people involved, the effects, that music or sometimes the show! The show that just edges to the top for me is the launch of the Cultural Olympiad in Ironbridge. I was the technical project manager and had an amazing team that created a huge lighting installation covering many of the sites in the Ironbridge Gorge area. To work in the presence of engineering greats is always a special experience.”

Pete thinks his was “the original London *Lion King*; there's not many shows now that use a thousand channels of dimming! It was a challenge of a scale that hasn't really happened since. I'm pleased to say that it's all still there and working. As far as pure enjoyment goes, I'd have to say my favourite was the production of *Once*, which we started at the Gaiety in Dublin and moved into the Phoenix theatre. It was a beautiful show with virtually no technology and a really talented creative team and cast.”



For Nick it was “probably one called *Moon Water* by Cloudgate Dance Theatre of Taiwan. It was a dance piece that used tai-chi and martial arts as the basis for a lot of the physical movement. Over the course of the last forty minutes of the show, water was trickled slowly onto the dancing surface, until by the end of the show the whole performing area was covered in a small lake a centimetre or two deep. There was a mirrored ceiling to the set and a mirrored back wall, so the dancers' reflections could be seen in those and on the water's surface. It looked incredible – as they were executing their martial arts moves water was flying through the air and being caught in the sidelight. It made for a pretty unnerving time electrically though! From the enormous water tank behind the back wall containing a 63 A three-phase heater, to the lighting booms each side of the stage just metres away from the flying water, it was certainly one to have your wits about you as the electrician (to say the least).”

But those national spectacles are generally always high up the list, as Nick explains:

“My most memorable show overall was definitely being part of the scenic lighting team for the London 2012 Olympic and Paralympic ceremonies. Some pretty wacky projects to light up as part of a team of really positive and proud professionals. Pretty much everyone felt good about that one!”

## Uh-oh...

Conversely we've all had moments when it doesn't go according to plan and a show is memorable for the wrong reasons. The passage of time often puts a rosy haze over memories of such events, but when they do happen it can be deeply embarrassing; so we asked the guys if they've had any jobs where they wished they'd stayed at home, such as when the curtains have closed early or they've sat there for the entire show holding something together with gaffer tape...

For Martin the answer was:

“Not as a result of anything I've done directly” (which did beg the question about what he may have done indirectly...). “After all, part of my job is ensuring that the lighting rigs I am responsible for work safely and reliably with no chance of stopping the show. There have been a few situations outside my control, and it often involves doing shows abroad running from generators. Like the time mid-matinee where the generator bloke turned up to refill the fuel tank and just turned it off mid-show...!”





“There was another time when I had installed a show in a theatre in Moscow. I had been back at home for several weeks when I got a report that they had lost a show because the lighting desk had broken. When I asked why the show had not continued on the backup desk, it eventually transpired that the producers, who had never wanted to pay for a backup, had hired it out to another show!”

Pete was a little coy:

“I’ve worked on plenty of duds – I’m not willing to mention them though.” As a testament to the technical crews, he did take an audience member’s perspective. “My biggest bugbear is when shows get delayed or cancelled for ‘technical reasons’. It is very rarely a technical problem. I wish producers, directors etc. would just own up to the fact they just aren’t ready to do a show because they’ve either run out of time or ideas. Or in a recent case at the Savoy, the cast weren’t in a fit state to go on stage. Stop blaming the technicians!”

Robin has also been incredibly lucky in his career, but acknowledged:

“We all have ‘moments’! Over the years, you become good at wing-and-prayer fixes using whatever is to hand. I have never had to bring a show down early, although I have had some close calls – such as doing an event on a Royal Navy warship where the power kept going off until a junior rating helped us out by changing the supply fuses. Shortly after that there was a small fire, but we were back up and running quickly ...”

For Nick there’ve been “lots of minor hiccups! But nothing too dramatic I don’t think. Quite a few years ago I watched the stage plunge into complete darkness on the last lighting cue of the opening number of a musical. An adjustable RCD at the venue covering the whole stage lighting supply was set too low for the cumulative effects of the earth leakage from all our equipment. What should have been a very bright lighting state, snapping up quickly for the



freeze-frame moment at the end of the high-octane opening number, ended up being somewhat less than impressive. Cue my colleague's seemingly slow motion comedy run back towards the stage ...”

## Getting started in the business

We asked how the four got started in the industry as there isn't a tried-and-tested route. Robin was involved in amateur theatre from his childhood and loved working backstage. After gaining A-levels and a degree in Electronic System Design Engineering (“this was a great course where we covered many areas of engineering and learnt how to make things work in the real world”) he landed a job at a leading exhibition company. This involved travelling the globe installing high-end exhibition stands with a lot of ground-breaking technology. “I learnt a lot about problem solving during that time – when you are on your own in a far-flung location you have to make it work. From there, I moved into events and then theatre, learning all the way.”

For Pete it started at school before “going on a course run by the ABTT. The course gave you electrical qualifications as well as direct contact with the industry on a daily basis. It was pretty cool being lectured by the man that invented the Patt 23!” [The Patt 23 is an iconic early lighting fixture made by Strand Lighting.]

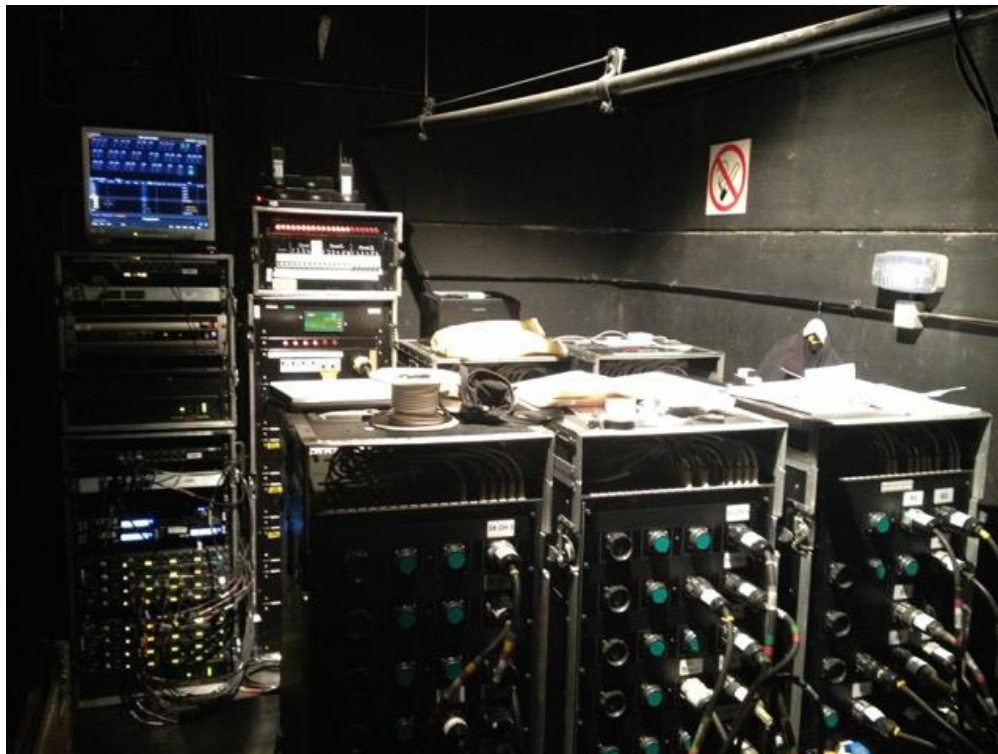
Martin's interest was first sparked at school. “I was quite good at chemistry and the chemistry teacher also 'did the lighting' for school plays. Mr. Davidson has a lot to answer for! During the school summer holidays I joined The National Youth Theatre (NYT), then based in London at The Shaw Theatre. There I met Jerry Hodgson, the NYT Chief Electrician. When I dropped out of University (Electronic Engineering – far too much maths), Gerry had moved to The Lyric Theatre, Hammersmith, and he offered me my first job. So there was no formal training or qualifications, just being in the right place and knowing the right people.”

In terms of careers advice to budding production electricians, Pete says that you should “get some electrical education, even if it's only the basics. I meet so many people that have done a three-year lighting course/degree and they can't calculate the load of a single lamp, never mind the entire lighting rig.”

One of the characteristics of modern shows is that deploying the technology used is virtually a job in itself. In years gone by, the production electrician would have had a hand in the DMX data work, programming the lighting desk and maybe some lighting design and other roles as well, but Pete encourages newcomers to be focussed on one job:

“If you want to be a production electrician then be one, don't also try to be an associate or a programmer or an LD [lighting designer] at the same time. Also be prepared to get physical - no matter what happens with technology over the next 20 years, the lights are never going to get themselves off a truck, into a theatre, and plug themselves together!”

That doesn't mean that you shouldn't be aware of other functions – as Robin says, you should “get a broad range of experience, listen and get to know people. The best production electricians understand the technical elements but also get the creative element and know what other people around them are doing. Go and spend a few days sitting with a lighting designer, at the scenic workshop, in the wardrobe and all of the other departments so that you understand their roles and pressures. “



Nick's advice is that you "get a very good grounding in electrical knowledge, but realise that doesn't necessarily need to involve getting the full set of electrical qualifications that a more traditional electrical installation contractor might do. There is a lot in traditional courses that won't be relevant as a theatre production electrician, and competence is about having the training and experience that is relevant to the work you are actually doing."

He also noted that you should "try and work with as many experienced production electricians as possible, in as many environments as possible. Be hard working, positive, and especially nice to people who are working for you. Know your limits and when to ask for help or advice. Don't pretend to understand something you don't; nobody knows everything or ever will."

The job is one of unsocial hours, travel and fun in some weird and wonderful places, so welcome attributes include a sociable can-do attitude which is essential when working under pressure as part of a close-knit team. To highlight this, the last word goes to Nick who identifies the most important task a budding production electrician should be willing to do: "Always buy a round ...!"

## Student's Guide College Roadshow: Isle of Wight

We recently took the Student's Guide College Roadshow to the Isle of Wight College. We were keen to visit the college as Section Leader for Electrical Installations Derek McGrath provided a technical review of the *Student's Guide to the IET Wiring Regulations*.

As usual, we had some fantastic guests to take with us on the Roadshow. Anthony Medway from MICC spoke about mineral cable – clearly a topic of interest with students (gauging from their eagerness to talk with Anthony after the event!) who are familiar with the cable as many of them work with it at the college.

James Eade, who many of you will know as author of *Temporary Power Systems* but who has also been helping us behind the scenes to source our Wiring Matters articles on theatre, gave a stellar performance talking about the various career opportunities available to students, then focusing on how students and apprentices could carve out a life beneath the lights working in big event installations or theatre. We thought James' talk would be of particular relevance given the Isle of Wight festival every year!

We were fortunate to be joined by the Recruitment arm of Straininstall, a division of James Fisher & Sons. Their aim was to engage with students who might be interested in learning more about available apprenticeships and career paths after they complete their studies. I didn't anticipate that the entire hall of students would be lining up to sign up and learn more, and it shows the need to bring recruitment opportunities to students around the UK.

IET host of the event, Steven Devine, provided an overview of the IET to the students and introduced them to how BS 7671 is developed and the other activities the IET is involved in.

### Find out more

You don't need to attend a College Roadshow to find out more.

Visit <http://www.temperature-house.com/fire-survival-wiring/what-is-micc-cable> to learn about mineral cable. If you've not yet bought a copy of James' *Temporary Power Systems*, have a look at his website <http://www.eade.uk.com/>. If you're a student, look back over this year's issues of Wiring Matters for some interesting reads on theatre work, including a host of interviews with electrotechnical engineers, and look on the Job Profile Bank for information about how to get involved in this fascinating area of the industry.

If you know anyone in the area who might be after an apprenticeship, please pass on the website: <http://www.straininstall.com/about/careers/>

You can also find out more about the speakers and the day itself by watching the video: <https://tv.theiet.org/?videoid=9456>.



We filmed some technical videos at the College, and would like to thank Ryan Evely and Ryan Adhimar for participating in those and giving some sterling performances! We're looking forward to publishing the videos on IET.tv and on the Student's Hub early next year.

### **Would you like us to visit your college?**

Our schedule of college visits is already underway. Please get in touch if you'd like to find out about opportunities for your college.

Each visit will comprise of speakers, freebies and a competition with prizes.

## **Warning - Important Safety Notice**

### **RECALL of Hager 10kA Miniature Circuit Breaker (MCB)**

Date: 5<sup>th</sup> October 2016

Dear Customer,

We are contacting you to inform you that during our internal quality control process a raw material non-conformity has been detected.

This raw material non-conformity could affect the correct functioning of the **Hager 10kA MCB with references as indicated in Appendix CPA** sold between **7<sup>th</sup> July 2016 and Today**.

**Based on our investigations, this non-conformity could lead to a potential MCB malfunction which could cause fire or electrical shock danger.**

**For this reason, on the basis of the Precautionary Principle and user safety, we have made the decision to recall the Hager 10kA MCBs concerned.**

To ensure maximum effectiveness of the operation and to prevent or, at least, minimise danger and risk to your customers and users, your full support and cooperation is absolutely essential.

With immediate effect upon receiving this letter, we kindly request that you:

1. **Immediately stop the Installation of Hager 10kA MCBs with the references indicated in Appendix CPA purchased between 7<sup>th</sup> July 2016 and Today**
2. Identify any Distribution Boards where you have installed the references concerned.
3. Make an inventory of the number of MCBs you have installed for each reference concerned.
4. **Without delay, replace any Hager 10kA MCB references concerned in Appendix CPA you may have installed. Also remove any of these references from your stock and either send them back directly to Hager or contact us and we will arrange a collection**
5. Document and report back your costs (travel, checking & replacing, time & material) with evidence using the report **Appendix CPB**. *All costs will be reimbursed in line with the Compensation Policy a copy of which is obtainable from the Recall Team.*

Please do not hesitate to contact us if you need any assistance regarding this recall. Our contact details are:- Telephone:- 01952 675555 Email:- [mcb@hager.co.uk](mailto:mcb@hager.co.uk)

We remind you that, in accordance with legal requirements, your full legal liability and responsibility could be involved if you fail to act promptly on the action points listed in this communication.

We thank you in anticipation for your support and cooperation and we apologise for the inconvenience this matter may cause to you and your customers.

Best Regards



Bruce Davies  
Managing Director

### Appendix CPA

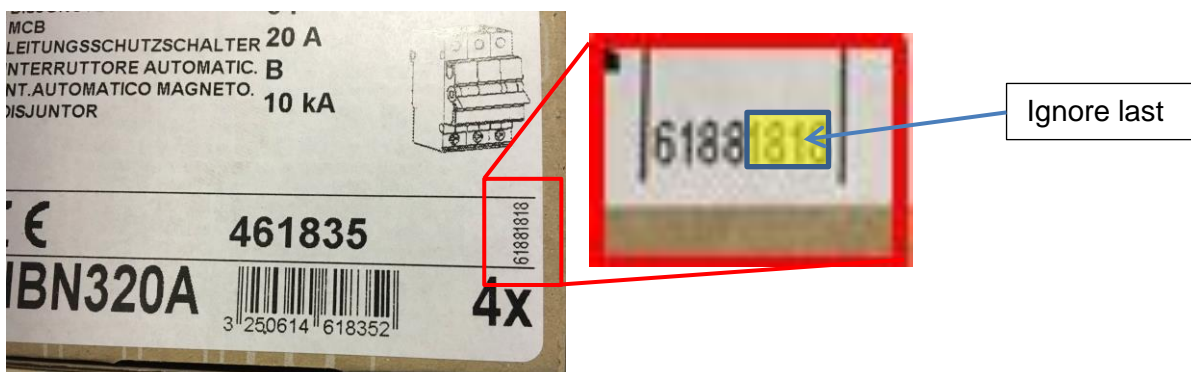
Check if **REFERENCE** of product is in list below

#### UK Market

NBN106A	NBN110A	NBN116A	NBN120A	NBN125A	NBN132A
NBN140A	NBN150A	NBN163A	NBN216A	NBN220A	NBN225A
NBN240A	NBN306A	NBN310A	NBN316A	NBN320A	NBN332A
NBN340A	NBN350A	NBN363A	NBN416A	NBN432A	NCN100A
NCN101A	NCN102A	NCN103A	NCN104A	NCN106A	NCN108A
NCN110A	NCN116A	NCN120A	NCN125A	NCN132A	NCN140A
NCN150A	NCN163A	NCN201A	NCN202A	NCN204A	NCN206A
NCN210A	NCN216A	NCN220A	NCN225A	NCN232A	NCN240A
NCN250A	NCN263A	NCN301A	NCN306A	NCN310A	NCN316A
NCN320A	NCN325A	NCN332A	NCN340A	NCN350A	NCN363A
NCN402A	NCN420A	NCN432A	NCN440A	NCN463A	NDN102A
NDN106A	NDN110A	NDN116A	NDN120A	NDN125A	NDN132A
NDN140A	NDN150A	NDN163A	NDN202A	NDN206A	NDN210A
NDN216A	NDN220A	NDN225A	NDN240A	NDN250A	NDN263A
NDN306A	NDN310A	NDN316A	NDN320A	NDN325A	NDN332A
NDN340A	NDN350A	NDN363A	NDN463A		
VA02SPD	HQ3_DB_LBM_G	HQ3_JK-2784_2015	HQ4_JK_2782_2015		

**Therefore, we ask you to:**

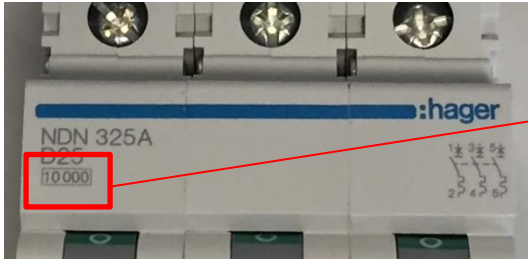
1. Check current stock for any identified products on the attached return form, **manufactured between 7th of July 2016 and 25th of September 2016**, and remove all non-conforming items from sale.
2. For products in the original carton the date code is identified as shown: The 8-digit code is Year/Day/time



Up to 6188	OK to use
6189 to 6269	Isolate and return to Hager
6270 onwards	OK to use



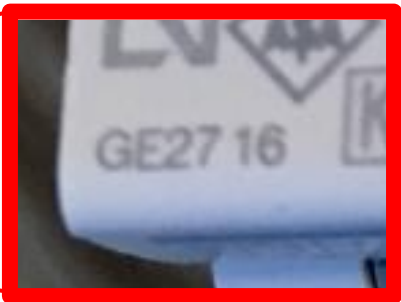
3. For product which is not in the original carton the 10kA rating can be identified as shown below. There is a date code on the MCB located on the top surface above the grey actuator. This relates to the week of manufacture as shown below:



10kA Rating



27 is the week of manufacture,  
 16 is the year



If the code is shown on the table below, then please return stock to Hager.

GE2716	GE2816	GE2916	GE3016	GE3116	GE3216
GE3316	GE3416	GE3516	GE3616	GE3716	GE3816



**APPENDIX CPB**  
**Inspection/exchange report**

Installer name :  
 Installer address :

Customer Name FULL Address	Inspected quantity	Exchanged quantity	Exchanged references	Material replacement cost (Invoice to be attached)	Travel & Labour cost	Total cost	Date and final customer signature

Total Cost

Installer signature :