News for the industry from Electrical Safety First

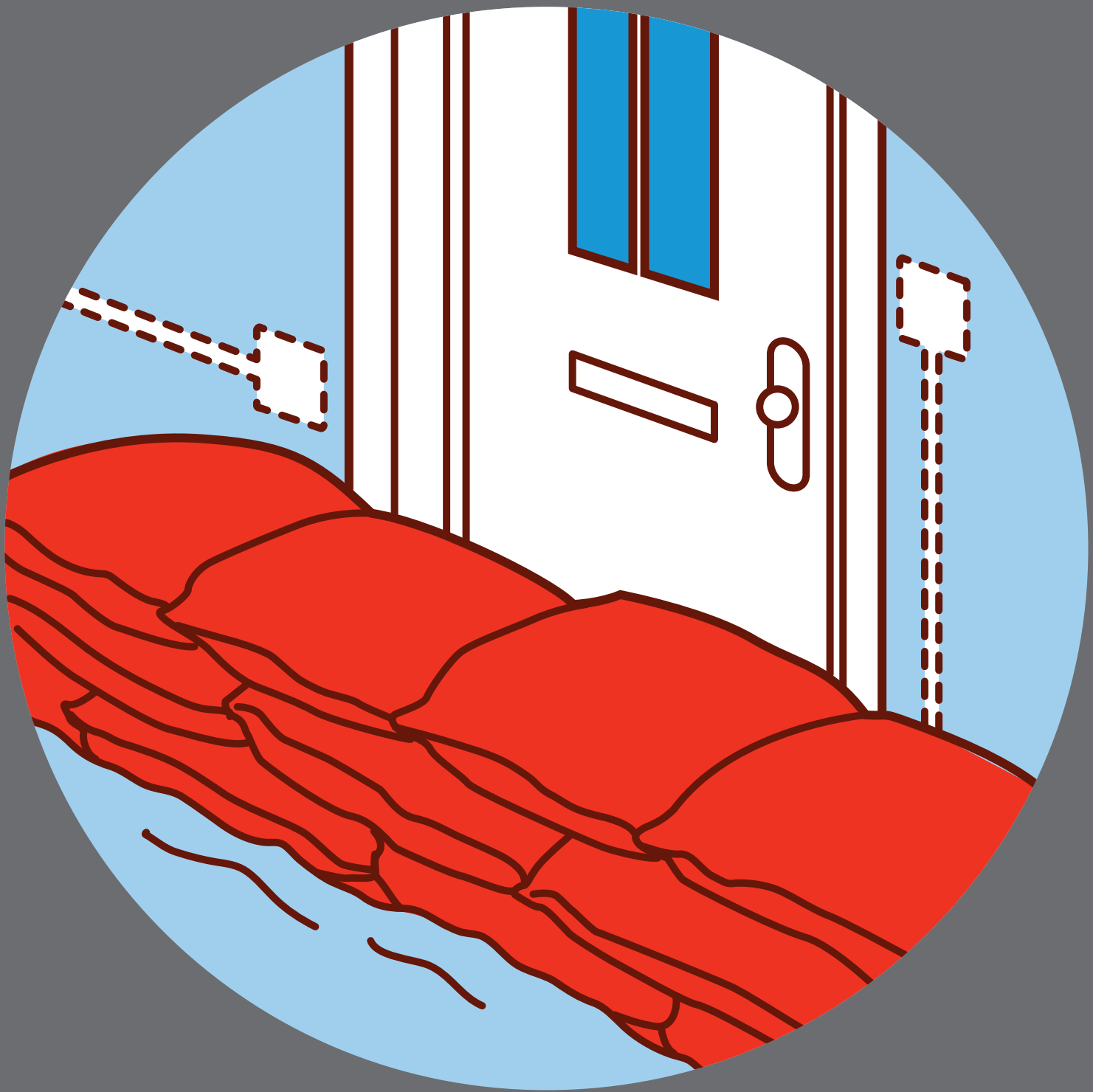
£5.00

Switched On

Issue 36 Spring 2015

Electrical Safety First

The UK's electrical safety experts

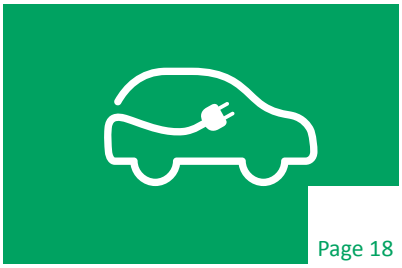


» Can wiring be reused after floods?

Also, Electrical installations in loft spaces of thatched buildings


Page 14


Page 9


Page 18

News

Feature

Technical

Letters

I'm sure that there are many within the electrical industry who will have strong feelings about some of the issues raised in Switched On. So feel free to shout about them.

Please email your letters to the Editor of *Switched On* at:
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From the DG's desk

Welcome to the first *Switched On* of 2015.

The past few months have been an exciting time for Electrical Safety First and, whilst this year will see us continue in our efforts to keep people safe from the dangers that electricity can pose, it will also throw up changes that need to be confronted in order to ensure that the Charity's success continues.

One such change concerns *Switched On*. Having conducted a readership survey and after extensive discussions, we have decided to alter the way that we deliver Electrical Safety First's news.

So, rather than offering a single, quarterly publication containing a broad range of information from across the Charity's technical and campaigning divisions, we feel that more frequent and targeted news releases will provide our readers with a better experience.

As a result, this issue of *Switched On* is the last but, as we say a fond farewell, we prepare to welcome in its place a series of shorter and sharper regular bulletins offering technical guidance and updates on developments from across the electrical industry.

Details of the Charity's campaigning activities can be found on our website and over social media.

We believe that more frequent updates will be of enormous benefit to our readers, as it will allow us to share breaking news about developments in the industry much faster than we have been able to through a quarterly journal.

It is not just *Switched On* that is changing over the coming months. With a General Election on the horizon, there is the potential for great change to the domestic political landscape in which Electrical Safety First operates.

These changes bring about exciting opportunities for the Charity and will allow us to promote our work to new political audiences.

We have already begun developing our strategy for approaching the new Parliament and, with our recent success in Scotland where our campaigning has seen the introduction of five-yearly electrical checks in private rented properties, we are in a much stronger position to help affect change throughout the rest of the United Kingdom.

The House of Lords recently played host to the launch of a crucial report, commissioned by Electrical Safety First, which aimed to highlight the dangers that electricity can pose to our elderly population.

Entitled '*A Shock to the System: Electrical Safety in an Ageing Society*', the report revealed that one million people aged over 75 live in 'non-decent homes' – which are homes that fail to meet the Government's Decent Homes Standard by being too cold, being in a poor state of repair or not having modern facilities.

The event was a great success and the report itself received some high-profile press coverage, so I would like to thank everyone involved for helping to put this very important issue under the spotlight.

To end, it is worth referring to an age-related crisis of my own. For some reason, I have agreed to participate in the forthcoming London to Brighton Bike Ride on 21 June.

Alongside some of my colleagues under the moniker of "The Electrics", we will be riding the 54 miles in order to raise money for the British Heart Foundation.

I have no doubt that it is going to be a gruelling challenge but it is all for a fantastic cause.

As always, we would welcome feedback on the content of *Switched On*. Please email **feedback@electricalsafetyfirst.org.uk**

Phil Buckle
Director General

Electrical Safety First welcomes a review of the product recall system

In March, Jo Swinson, Consumer Affairs Minister, announced that consumer campaigner Lynn Faulds Wood is to lead a review of the UK's system for the recall of unsafe products.

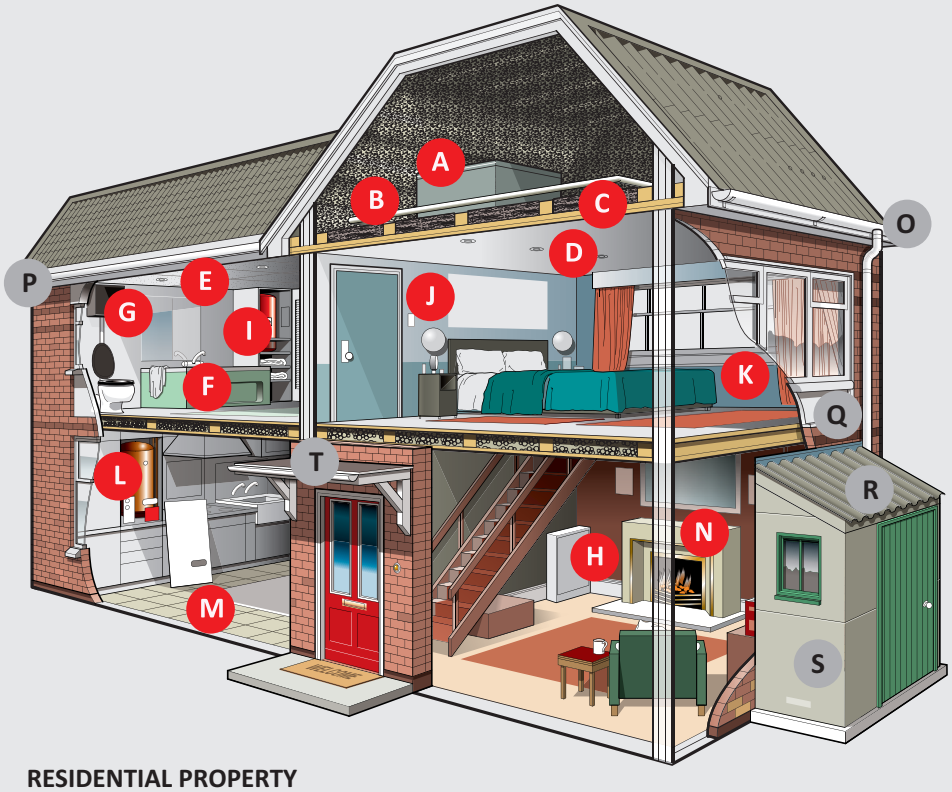
Welcoming the news, Phil Buckle, Director General of Electrical Safety First said: "Faulty electrical products pose a real threat to consumers, their families and their property, so we're delighted that the Department for Business, Innovation and Skills has announced this independent review of the recall system.

"Not only does it demonstrate that the Government is committed to improving recall effectiveness, but we also hope that it puts the issue of recalls more generally into the spotlight.

"With current success rates for the recall of faulty electrical products being as low as 10% - 20%, consumers, manufacturers and authorities need to face up to the dangers of an ineffective recall system and work together in order to improve it. We hope today's announcement is the first step towards achieving this."

Electricians' long term health still at serious risk from asbestos

The Health and Safety Executive (HSE) has launched another campaign to raise the awareness of those working in building trades - including electricians - to the continuing dangers of exposure to asbestos fibres, and help them take steps to protect themselves.



RESIDENTIAL PROPERTY

Inside

- A Asbestos cement water tank
- B Pipe lagging
- C Loose fill insulation
- D Textured decorative coating e.g. Artex
- E AIB ceiling tiles
- F AIB bath panel
- G Toilet seat and cistern
- H AIB behind fuse box
- I AIB airing cupboard and/or sprayed insulation coating on boiler and hot water tank
- J AIB partition wall
- K AIB interior window panel
- L AIB around boiler, storage heaters and warm air heating systems
- M Vinyl floor tiles
- N AIB behind fire

Outside

- O Asbestos cement gutters and downpipes
- P Soffits - AIB or Asbestos cement
- Q AIB exterior window panel
- R Asbestos cement roof
- S Asbestos cement panels
- T Roofing Felt

AIB = Asbestos insulating board

As previously reported in *Switched On*, an average of six electricians die every week in the UK from the effects of being exposed to asbestos during the course of their work many years earlier.

But despite the repeated health warnings and awareness campaigns, a recent HSE survey found that ignorance of the serious risks of asbestos remains worryingly high.

The survey of 500 tradespeople looked at the frequency of potential exposure to asbestos in the workplace, the continuing misconceptions about the risks, and how exposure to those risks could be minimised.

The survey found that, on average, those employed in building trades could come into contact with asbestos more than 100[1] times in a year .

It also revealed that those likely to be exposed to asbestos believed incorrectly that drinking a glass of water (14%) or opening a window (27%) would help to keep them safe from asbestos dust, or minimise exposure risk.

Only 30% of those taking part in the survey could identify all the correct measures for safe asbestos working, and 57% made at least one potentially lethal mistake in relation to measures to stay safe.

The survey also revealed that only 15% of participants were aware that asbestos-containing materials could be present in any building constructed before the year 2000.

A key feature of HSE's Beware Asbestos campaign is a web-based app suitable for use with smartphones, tablets and laptops.

The app is designed to help those working in building trades to more easily identify where they might come into contact

with asbestos in their daily work activities.

It gives clear advice on how they can protect themselves, identifying where work requires a licensed contractor, including the ability to search for one locally, or providing simple how-to information for small non-licensed tasks that could disturb asbestos.

There is also a useful gallery showing typical materials that contain asbestos.

Philip White, HSE's Chief Inspector for Construction, said: "Asbestos is still a very real danger and the survey findings suggest that the people who come into contact with it regularly often don't know where it could be and worryingly don't know how to deal with it correctly, which could put them in harm's way.

"Our latest campaign aims to help tradespeople understand some of the simple steps they can take to stay safe.

"Our new web app is designed for use on a job so workers can easily identify if they are likely to face danger, and can then get straightforward advice to help them do the job safely."

The web-based asbestos safety app can be found at: **www.beware-asbestos.info/news**

Further information about asbestos safety can be found at **www.hse.gov.uk/asbestos**

[1] The results of the survey showed that tradespeople work an average of 2.29 days a week in buildings built prior to 2000 and which may therefore contain asbestos. This figure is multiplied by 48 (52 weeks per year minus an estimated four weeks non-working time) to give an annual figure.

New requirement tackles 'cable entanglement' deaths

A life-saving requirement that will help prevent fatalities caused by cable entanglement in building fires has been included in the UK standard for the safety of electrical installations (*BS 7671*), thanks to successful lobbying by Electrical Safety First in collaboration with Fire and Rescue Services.

There have been some tragic outcomes in recent years when falling cables in burning buildings have trapped both those trying to escape and firefighters trying to save lives.

The new requirement, included in the third amendment to *BS 7671: 2008* which was published on 1 January this year, will come into effect on 1 July. It will require newly-installed wiring systems in escape routes to be so supported that they will not be liable to premature collapse in the event of a fire.

"Experience has shown that, where installed at high level in corridors, stairways and other escape routes (and particularly in high rise blocks of flats), cables supported only by plastic cable clips, or by plastic trunking or conduit without additional metal supports, can pose a significant risk during a fire - both to residents and those attempting to rescue them" explains Martyn Allen, Head of Technical at Electrical Safety First.

"We are delighted that our partnership approach to this issue, working with the Chief Fire Officers Association (CFOA) and other key stakeholders, has led to this important addition to *BS 7671* - which is a step-change improvement in safety."

John Bonney, Chief Officer at Hampshire Fire and Rescue Service, said: "Following the death of our two colleagues, Alan Bannon and James Shears, at Shirley Towers in Southampton, the Coroner found that fallen cables – which hampered their attempts to escape - were a key factor in the tragedy.

"The Coroner recommended a change to the rules concerning the support of overhead cables and we have lobbied hard over the last two years, through CFOA, to bring this about.

"While we cannot undo what happened at Shirley Towers, or other fatal fires where falling cables have been a factor, this small but vital change in the UK Wiring Regulations will, over time, help protect both the public and firefighters and reduce the risk of them facing similar dangers in the future."

Andy Reynolds, CFOA Lead Officer for Electrical Safety, added: "A new requirement in the UK Wiring Regulations has been included thanks to the hard work of Electrical Safety First and a successful partnership with CFOA. This change is a significant life-saving improvement."

Further details of the new requirement can be found in the autumn 2014 issue (No 34) of *Switched On*.

Government questioned about risks from counterfeit electrical goods

Last December, Jim Fitzpatrick, MP for London's Poplar and Limehouse, tabled an Early Day Motion in the House of Commons recognising the work of Electrical Safety First and its campaign to raise awareness of online sales of counterfeit electrical products.

The Motion called on the government to assess and tackle the number of dangerous counterfeit electrical goods being traded online. Such substandard goods contribute to thousands of fires in UK homes each year, and have the potential to cause significant harm.

Research by Electrical Safety First has found that the sale of counterfeit goods on social media is a growing trend – increasing by almost 15% in the last year. Seizures of substandard mobile phone chargers rose by over 50% during the same period.

"We're delighted that Jim Fitzpatrick raised this safety issue in Westminster, and thank him for his commendation of Electrical Safety First and its work", said Director General Phil Buckle.

"There is a serious safety issue with counterfeit electrical products which becomes particularly pressing during the Christmas period when people are looking for a bargain.

"Unlike fake designer clothes or pirate DVDs, counterfeit electrical products are likely to contain substandard parts which can result in serious injury to people and damage to property."

Since the Early Day Motion was tabled, the government has pledged an extra £400,000 to help Trading Standards officers prevent dangerous goods being sold in the UK.

The announcement came from Consumer Affairs Minister Jo Swinson whilst on a visit to Southampton Port in February, where she was able to see the work of local Trading Standards officers first hand.

She said: "Dangerous and fake goods hurt legitimate businesses and put consumers at risk of harm. This extra money will help protect the public and make it easier to catch rogue traders.

Anyone who has concerns about the safety of a product they have bought should contact the Citizens Advice Consumer Helpline on 03454 04 05 06."

Amendment 3 implementation dates

As widely publicised, Amendment No 3 (AMD 3) to *BS 7671: 2008* was published, on schedule, on 1 January this year.

As is the norm when new editions of, or amendments to, *BS 7671* are published, a transition period of six months is allowed before the design of all new electrical installation work is required to comply fully with the changed requirements.

Unusually however, the implementation date for one regulation in AMD 3 - 421.1.201 - which gives requirements for the non-combustibility of enclosures of new and replacement consumer units in domestic premises - has been deferred until January 2016 to give manufacturers sufficient time to make any necessary changes to their product lines.

But, subject only to the availability of consumer units complying with the new non-combustibility requirements, there is nothing to prevent new electrical installation work being designed fully in accordance with AMD 3 requirements ahead of the official implementation dates. Indeed, Note 2 to Regulation 421.1.201 acknowledges that the early adoption of its requirements is permissible.

As all changes to *BS 7671* are designed to enhance the safety of those using electrical installations, Electrical Safety First would encourage their adoption as soon as practicable.

Timeline for Amendment 3 of BS 7671: 2008

1 January 2015:
AMD 3 published

1 July 2015:
Electrical installations to be designed in accordance with all requirements of AMD 3 except those of Regulation 421.1.201

1 January 2016:
Requirements of Regulation 421.1.201 come into effect

More solar panel businesses in court after workers fall

In the autumn 2014 issue of *Switched On* (No 34), we reported on two prosecutions that followed falls by solar panel installers.

Unfortunately, such falls seem to be an all-too-frequent occurrence as there have since been at least two further prosecutions for similar failures to comply with basic health and safety requirements.

Last September, the owner of a solar panel business was prosecuted for failing to make an adequate assessment of the risks involved in working on a fragile roof and not taking sufficient action to reduce those risks, following an incident in which two brothers fell more than 4.5 metres.

Andrew Green, trading as Green Park Power, was prosecuted by the Health and Safety Executive (HSE) after an investigation found there was no equipment or measures in place at the site, such as nets or scaffold edge protection, to prevent or lessen the severity of a fall.

At the time of the incident in June 2013, the brothers, who were working on behalf of Mr Green, were installing solar panels on a farm building in Monmouthshire.

One of the brothers suffered a compression fracture of his back and sternum, while the other managed to escape injury.

Mr Green, of Maple Close, Abergavenny, was fined £4,500 and ordered to pay costs of £1,500 after pleading guilty to a breach of the Health and Safety at Work etc. Act 1974[1].

Then, in January this year, a Preston-based company was prosecuted following the death of a man who was installing solar panels.

The 34-year old man, who was working on the roof of a cowshed, fell five metres onto a concrete floor when a clear plastic panel in the roof gave way under him. He died of his injuries in hospital ten days later.

Eco Generation Ltd of Watkin Lane, Lostock Hall, was prosecuted by the HSE following the incident which occurred in November 2011.

At the trial at Preston Crown Court, it was stated that Eco Generation Ltd had been installing solar panels on the roof of a large cowshed approximately 60 metres long and 20 metres wide.

Despite the size of the roof, each solar panel installer had been given only two 'Youngman boards' to stand on as they worked, although there were dozens of the fragile plastic rooflights.

The deceased was installing a solar panel close to one of the rooflights when he inadvertently stepped onto it and fell through to the concrete floor below.

The court was told that measures such as installing netting under, or placing protective covers over, the fragile rooflights could have been taken to protect the workers. The HSE investigation into the incident found that netting had been installed under some of the panels, but not under the one the man fell through.

Eco Generation Ltd was fined £45,000 and ordered to pay £20,515 in prosecution costs after pleading guilty to two breaches of the Work at Height Regulations 2005[2].

Information about working safely at height is available on the HSE website at **www.hse.gov.uk/falls**

Free guidance on safe working practices for those involved in the installation of solar panels can be viewed or downloaded free of charge from: **www.cskills.org/uploads/GS001_Safe%20solar%20panel%20installation_tcm17-33755.pdf**

Electrical safety in an ageing society

Electrical Safety First is urging the government to put an end to poor quality housing after a report found that one million people in the UK aged over 75 currently live in non-decent homes.

The report, *A Shock to the System: Electrical Safety in an Ageing Society*, reveals that much of the current housing stock is putting vulnerable people at risk, and is not fit to allow people to age safely in their own homes. Those living in low-income households or in rural areas are most badly affected.

A shortage of new homes being built combined with an ageing population means this situation will worsen unless urgent action is taken.

Homes are classed as 'non-decent' if they fail to meet the government's *Decent Homes Standard*, which means that they are not warm enough, are in a state of disrepair or do not have modern facilities.

Poor electrical safety is a particular concern. Nearly two-thirds of homes with a couple aged over 60 do not meet basic electrical safety standards[1], which include PVC-insulated wiring and life-saving protective devices such as residual current devices.

The report raises serious concerns about the electrical safety of older people. More than 350,000 people in the UK are seriously injured by electricity every year.

And older people are more likely to be affected - those over 60 are ten times more likely to die in a fire than those aged 17 to 24.

Older people are disproportionately at risk because they are more likely to have been living in the same property for many years, which could mean long intervals between comprehensive safety checks.

Also, their electrical installations and appliances tend to be older. 42% of those who have lived in their home for 30 or more years live in non-decent accommodation[2].

Phil Buckle, Director General of Electrical Safety First, said: "The government has a duty to ensure that no one is living in unsafe housing, and yet a million over-75s live in housing deemed non-decent by its own standard.

"A shortage of new builds means that the housing stock will continue to age, electrics will continue to deteriorate and vulnerable people will continue to be put at avoidable risk.

"Most elderly people want to stay in their own home for as long as possible, but for this to happen we need central and local government to act to ensure they can maintain their independence by living in safe and decent homes."

Baroness Greengross, Chief Executive of the International Longevity Centre which authored the report on behalf of Electrical Safety First, said: "As our population ages we're seeing more older people living independently at home.

"It's therefore vital that every effort is made to make the home environment as safe as possible.

"However, our inquiry found that too many older people are living in poor housing conditions, potentially putting them at risk of harm from electricity amongst other things.

"We know there are one million older people living in non-decent homes - there now needs to be a concerted effort by central government and local authorities to rectify this".

Electrical Safety First is calling for central and local government to:

- ensure all housing meets the *Decent Homes Standard* to help prevent deaths and injuries from electrical hazards

- make it mandatory for private landlords to ensure that the safety of electrical installations in their rented properties is checked at least once every five years
- ensure tenants are protected such that they can report electrical and other hazards to landlords without fear of eviction
- target more 'at risk' homes with free electrical safety checks – such as those in which older people have lived for many years
- work with the voluntary sector to ensure that older people can claim the benefits to which they are entitled, some of which can be used to carry out electrical repair work.

The report also notes that there are other barriers to older people protecting themselves from the dangers that electricity can pose, which include a fear of letting strangers into their homes to carry out essential maintenance work, the cost of using tradespeople, and social isolation – all of which mean hazards may go unnoticed or be ignored.

Dementia can also increase safety risks as memory problems and confusion can lead to electrical appliances being used unsafely.

To help address these concerns, Electrical Safety First has produced a free leaflet which includes tips and advice for anyone concerned about electrical safety in their own home or that of a relative or friend.

The Charity has also produced a free smartphone app to help householders identify and address a number of electrical safety issues through a simple visual check of their home.

[1] 39% of households with a couple over 60 have all five electrical safety features, which include PVC wiring, a residual current device, a modern consumer unit, modern earthing and bonding, and miniature circuit breakers rather than fuses. This means that 61% of households with a couple over 60 do not have all of these features and do not fully meet current electrical safety standards.

[2] 42% of those who have resided in their property for 30 or more years live in non-decent accommodation

All research, unless otherwise stated, was conducted by the International Longevity Centre on behalf of Electrical Safety First.

The report 'A Shock to the System: Electrical Safety in an Ageing Society' can be found at:
www.electricalsafetyfirst.org.uk/news-and-campaigns/campaigns/electrical-safety-in-an-ageing-society

The Construction (Design and Management) Regulations 2015

Subject to Parliamentary approval, the Construction (Design and Management) Regulations 2015 (CDM 2015) will come into force on 6 April this year, replacing the 2007 version.

In January, the Health and Safety Executive (HSE) published draft guidance designed to help anyone having duties under the regulations to familiarise themselves with the changed requirements in the new version, and to prepare for them coming into force.

The guidance can be downloaded from **www.hse.gov.uk/pubns/books/l153.htm**

The HSE has also worked with the construction industry to produce complementary guidance specifically for small businesses. This complementary guidance can also be found by following the above link.

Notable changes from the 2007 Regulations include:

- The role of *CDM coordinator* is replaced by that of *principal designer*, giving responsibility for coordination of the pre-construction phase, which is crucial to the management of any successful construction project, to an existing member of the design team
- Recognition of the influence and importance of the client as the head of the supply chain and as the person best placed to set standards throughout a project
- Competence is split into its component parts of skills, knowledge, training and experience and - if it relates to an organisation - organisational capability. This is intended to provide clarity and help the industry to both assess and demonstrate that construction project teams have the right attributes to deliver a healthy and safe project.

It should be noted that both the Regulations and the draft guidance could be subject to change before they are approved by Parliament.

The final version of the guidance supporting CDM 2015 will be available from 6 April.

Research into the performance of wiring after floods

With around 5 million[1] properties in England and Wales already at risk of flooding, and with more still being built on flood plains, Electrical Safety First is looking at how certain types of cable perform after being immersed in water and whether, following a suitable drying-out period, they could safely be reused - rather than replaced - after the flood has subsided.

[1]*Environment Agency figures c. 2012.*

If it is not essential to replace wiring after a flood, there would be potential benefits including:

- significant cost savings
- shorter repair time
- earlier reoccupation.

As a first step, Electrical Safety First commissioned the British Approvals Service for Cables (BASEC), an independent and non-profit accredited certification body, to carry out some preliminary research into the performance, after immersion in water, of types of cable commonly installed in dwellings and light commercial buildings.

According to BASEC, such objective research has never before been carried out on these types of small power and lighting cable.

The research

Single core cables having conductor sizes ranging from 1.0 mm^2 to 4.0 mm^2, and flat twin and earth cables having 2.5 mm^2 live conductors, were subjected to tests after immersion in a range of water conditions similar to those likely to be encountered in floods.

The testing was designed to simulate both short and medium term immersion that could be experienced by installed cables during periods of flooding. The testing was conducted without energising the cables. The possible effects of the immersion of continuously energised cables were not investigated.

The cable samples, chosen at random from readily available stock, included both solid (Class 1) and stranded (Class 2) copper conductors to determine whether the difference in construction affected the ingress and/or egress of water during immersion and subsequent drying-out.

Research variables included:

- the condition of the water – varying from clean to salty to silty
- the extent of immersion of the cable – from dipping a cut end to full submersion
- the duration of immersion of the cable – ranging from 24 hours to 3 full months.

Test protocols

The following test protocols were used to investigate the penetration of water into immersed open ends of cables and the electrical performance of cables during and after immersion, and to determine the extent of degradation, if any, in the performance of the insulation and/or sheathing material.

1. **Wicking:** To determine the effect, if any, of capillary action, 2 m long samples of each type of cable were suspended vertically in the three types of water for a period of one week, with a length of 200 mm immersed below the surface. After removal from the water tanks, the samples were cut open and visually inspected for the presence of water inside the cable between the conductor and insulation and, where appropriate, between the insulation/protective conductor and the sheath.
2. **Penetration:** 5 m long samples of each type of cable were suspended horizontally in the three types of water. One end was kept 1 m clear of the water, with the remainder coiled at a depth of 1 m. After a period of one week, the samples were removed from the water tanks, cut open and visually inspected for the presence of water.
3. **Insulation resistance on drying:** 2 m long samples of the twin and earth cable types were suspended vertically in the three types of water for 24 hours, with 1 m immersed. After removal, each sample was allowed to dry in a vertical orientation and 500 V d.c. insulation resistance tests conducted on them at increasing intervals during a one week period to determine what effect, if any, immersion had had on the integrity of the conductor insulation.
4. **Medium term immersion insulation resistance:** 5 m long samples of the solid and stranded types of twin and earth cable were suspended at a depth of 1 m in the three types of water, with both ends clear of the water surface. The samples were then subjected, whilst immersed, to 500 V d.c. insulation resistance and 2000 V a.c. voltage withstand tests at increasing intervals during a three month period.

The results of the wicking and penetration tests indicated that cables with stranded conductors tended to be significantly more prone to water penetration than those with solid conductors. This is likely to be due to the presence of air spaces between the strands of a stranded conductor.

The results of the insulation resistance tests (for the short samples of cable) did not fall anywhere near to the minimum safety levels specified in *BS 7671*.

This indicated that there was insignificant degradation of the cable materials in the three types of water used and that, following appropriate drying out, inspection and testing, the cables could be re-energised with little observable difference in performance. However, no assessment of potential changes in the longevity of cables was made.

It was also noted that values of insulation resistance during testing were much higher for low smoke, halogen free (LSHF) cables than for PVC.

Having completed the preliminary investigation work, we intend to share the findings with other interested parties and seek support for further research.

We believe the findings of this and any future research will be of interest to insurers, and property developers and renovators, amongst others.

It may also be of interest to owners of property in areas liable to flooding who may be experiencing difficulty in getting flood insurance.

When finalised, the detailed report on the findings of the preliminary investigation will be made available on our website at **www.electricalsafetyfirst.org.uk/electrical-professionals/product-safety-unit,** where news of any further research will also be posted in due course.

Electrical Safety First would like to thank BASEC for their assistance with the investigation work.

General advice about electrical safety in the home after a flood can be found at: **www.electricalsafetyfirst.org.uk/guides-and-advice/around-the-home/flooding-advice**

Protecting private tenants in Scotland

In February, Margaret Burgess MSP, Minister for Housing and Welfare and Bob Doris MSP, joined Phil Buckle, Director General of Electrical Safety First, to highlight the new requirement in Scotland for private sector landlords to have regular electrical safety checks carried out in their rented accommodation.

The Minister also announced the publication of advance statutory guidance on the new requirement – due to come into force on 1 December this year – to help ensure landlords become aware of their new responsibilities, and to encourage early compliance.

The private rented sector (PRS) in Scotland has more than doubled in size in the last decade. Yet in 2012, almost two-thirds of homes in the sector failed to meet the Scottish Housing Quality Standard.

And as families with children now account for over a quarter of all private tenants, concerns over disrepair and safety in the sector were increasing - particularly since almost 70% of fires in Scottish homes during the year 2012-2013 were caused by electricity.

To address the concerns, Electrical Safety First worked with Bob Doris MSP to help ensure that the recent Scottish Housing Act included a requirement for private sector landlords to have electrical checks on the wiring, and on any electrical appliances provided by them, carried out in their rented properties by a registered electrician at least every five years.

The Scottish Government is funding Electrical Safety First to run an awareness campaign to publicise the new requirement in advance of it coming into force in December.

"We are delighted that electrical safety in the PRS in Scotland has now been properly recognised, and are extremely grateful for the support this issue has received from both Bob Doris and the Minister", said Phil Buckle.

The Minister, Margaret Burgess MSP, added: "I acknowledge the key role of Electrical Safety First in their campaign to raise awareness of electrical safety in the private rented sector.

"From December this year, the Housing (Scotland) Act 2014 will require private landlords to have an electrical safety inspection carried out at least once every five years.

"This will strengthen housing standards and improve the safety of tenants in the private rented sector. So I am pleased to announce the publication of statutory guidance for landlords on this new duty."

The Minister's statement was echoed by Bob Doris MSP, who said: "I was delighted when the Scottish Government included in the Housing Bill my amendment on electrical safety checks, and I pay tribute to the work done by Electrical Safety First and the Scottish Association of Landlords on this issue.

"I have no doubt that their tireless campaigning, of which this amendment is one result, will save lives."

Guidance on the new regulation can be found on the Private Rented Housing Panel website at *www.prhpscotland.gov.uk*

Seeking safety for Welsh tenants

Electrical Safety First is calling on the Welsh Government to include an important safety requirement in the Renting Homes (Wales) Bill for five-yearly electrical checks to be undertaken in homes in the private rented sector (PRS). The Bill is currently progressing through the Welsh Assembly.

Electrical safety checks are of particular importance in privately-rented homes because over a third of them fail to meet the UK government's *Decent Homes Standard* and because around 70% of fires in Welsh homes are caused by electricity.

"The PRS has become a major and expanding element in Wales, but such rapid growth brings its own problems, with safety a particular – and growing – concern", explains Phil Buckle, Director General of Electrical Safety First.

"If the sector continues to expand at its current rate, it's estimated that by 2020 one in five homes will be provided by private landlords.

"We believe regular electrical safety checks could significantly reduce the risk of fires and injuries in the sector and that they can be carried out without creating burdensome red tape for landlords."

The Welsh Government's own statistics show that almost a fifth (18.4%) of privately rented homes are unfit to live in.

As poorly maintained homes often have badly-maintained electrical installations, and with safety concerns increasing in line with the continuing expansion of the sector, the Charity is calling for:

- mandatory safety checks on the electrical installation in all privately-rented homes, and on any electrical appliances supplied by the landlord, at least once every five years, and
- the provision of residual current devices (RCDs), which help prevent deaths and injuries from electric shock, in all PRS properties.

Electrical Safety First has campaigned long and hard to promote these fundamental safety requirements and was disappointed when they were not included, despite being supported by the Communities, Equalities and Local Government Committee, in Wales' first ever Housing Act, which came into force last year.

The Renting Homes (Wales) Bill is a second opportunity to ensure that private tenants in Wales receive the same security as those in Scotland, where Electrical Safety First led the successful campaign to have regular electrical checks for homes in the PRS made a legal requirement.

Electrical installations in loft spaces of thatched buildings

This article, written with the assistance of Charles Chalcraft*, looks at the factors that must be taken into consideration to prevent an electrical installation in the loft space of a building with a thatched roof, or in close proximity to the thatch, posing a risk of fire.

The article considers what measures are necessary to ensure that cables and other installed equipment do not suffer damage when the roof is being thatched or maintained. Consideration is also given to the type of fire detection devices that should be employed in the loft space below a thatched roof.

Fig 1. *Smoke detector and fully enclosed bulkhead luminaire installed in roof space of a thatched roof. Cables are protected by steel conduit with both the luminaire and detector so placed as to minimise the risk of damage from thatching needles, thatching spars, screw wires and spiked access equipment.*

What is thatch and how long will a thatched roof last?

There are believed to be over 50,000 thatched properties in the UK, largely spread in an arc from the West Country to include Dorset and Hampshire, up into the Midlands and across to East Anglia.

Thatch is the term used for a range of natural materials used to provide a weatherproof roof to a property. The choice of material used is often dictated by local availability, planning permission conditions, or because of requirements laid down for the maintenance of a property that has been 'listed' by English Heritage or Historic Scotland.

Materials used for thatching include the following:

- Water reed (also known as Norfolk reed)
- Wheat straw, used as combed wheat reed or as long straw
- Heather, often used for crofts in Scotland.

Details of the construction of a thatched roof are outside of the scope of this article. However it is of note that, depending upon the type of material used and the effects of a range of environmental factors, the majority of a thatched roof may last for anywhere between 15 and 60 years, whilst roof ridges typically require replacement every 8 to 15 years.

Thatched roofs and fire risk

Thatched roofs are vulnerable to fire from a range of ignition sources including those emanating from a damaged or inadequate electrical installation.

Whilst the materials used to construct a thatched building are flammable, a well-laid roof in good condition is not particularly susceptible to ignition.

When thatch is applied to a roof, it is densely packed and well secured to the roof framing. Just as a tightly rolled newspaper will be more difficult to light than a loose sheet, so it is for thatch.

In short, a 'healthy' thatched roof is more likely to smoulder than blaze. The severity of a thatch fire is controlled by the availability of oxygen.

Fig 2. *Ineffective use of plastic mini trunking to provide additional protection for cables.*

However, because a well-laid thatched roof is impervious to water, this is likely to prevent firefighters from damping down a fire on the inside surface of the thatch from the outside without the roof covering being pulled apart to some extent. This might be a deciding factor when considering whether some form of fire detection is required in the loft space.

Considerations when planning an electrical installation

When considering what type of wiring system to employ, and what electrical equipment to install in the loft of a thatched property, the designer must ensure that the electrical installation is suitable for the environmental conditions likely to be present.

Factors that must be borne in mind include the likely presence of:

- rodents - such as mice, rats or squirrels that might damage cables by gnawing (especially in the winter months)
- accumulation of flammable dust and particles originating from the thatch falling on top-facing surfaces, especially where downlights have been installed into ceilings.

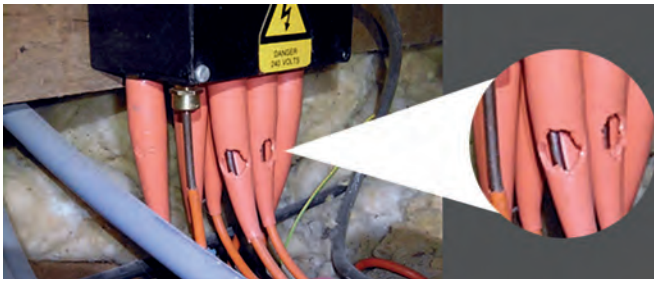


Fig 3. *PVC-served mineral insulated cable utilising steel adaptable boxes in a thatched roof space. Note the signs of rodent damage to the gland shrouds.*

Consideration must also be given to the likelihood of mechanical damage from outside the roof during thatching, caused either by the fixings used to secure the thatch to the roof frame, or the access equipment and sharp tools used whilst re-thatching is underway.

Fig 4. *Examples of likely causes of mechanical damage. Left, thatching needle (inset: thatching needle protruding through thatch). Right, thatching spars (inset: a thatcher's biddle – a work platform held on thatch by spikes).*

The electrical installation

Although there may not be evidence of the presence or activity of fauna at the time electrical installation work is being carried out, it is always possible that a thatched roof may become a home to rodents at some time during the life of the installation.

For this reason, it is recommended that a wiring system is employed that offers some degree of additional protection against gnawing beyond a cable's insulation and sheathing.

Wiring systems that might be suitable include:

- Mineral insulated cable
- Steel wire armoured cable
- Conductors installed in metallic trunking or conduit
- Metallic capping secured over insulated and sheathed cable.

Fig 5. *Plastic conduit installation fixed inboard of thatch. The plastic conduit would not prevent damage from thatching needles and spars during roof repair or replacement activities.*

There is some evidence that the use of high impact PVC trunking or conduit might provide a sufficient degree of protection against damage by mice. However, it is unlikely to be sufficient to prevent significant damage by rats or squirrels.

Where PVC trunking or conduit is employed, careful consideration should also be given to its location as it will not, of itself, offer sufficient protection for cables from damage by thatching needles and spars.

Any wiring system should be so sealed as to prevent the ingress of solid particles and materials, and indeed to prevent small animals from nesting in the equipment.

Arguably it is particularly important in a thatched roof to ensure that lids are properly secured on all joint and conduit boxes and that, for example, where luminaires are mounted into ceilings, they have fully enclosed terminal boxes.

Co-axial television aerial and satellite system cables should also be protected. Wherever possible, such cables should run down end gable walls and not be fed through the fabric of the thatch.

The fixings used when thatching can be anywhere between six to eighteen inches in length - long enough to pass all the way through the thatched roof - and are typically affixed with sufficient force to cause significant damage to any parts of the electrical installation with which they come into contact.

It is therefore recommended that, wherever possible, protected wiring systems should run along the centre of the loft - where cables will be away from physical damage by the thatcher and also away from rodents, which tend to travel near to the walls.

If there is no alternative, then protected cables can be fitted on the inside surface of the purlins, but the cable runs should not be fixed to rafters.

Ideally there should be no downlights installed into loft ceilings. But where such lights are installed, they should be positioned well away from the slope of the roof.

Where existing downlights are encountered, the property owner should be advised, if appropriate, that they should be:

- replaced by fully enclosed 'fire-rated' type downlights, and
- at least covered over by an insulation displacement cover placed between the joists

In either case this will provide improved protection for the downlights from dust ingress and mechanical damage.

Fig 6. *Improvised hoods over downlighters and their control gear. The main body is plastic soil pipe with a louvered vent panel resting on top of the pipe directing heat toward the thatch. The use of proprietary hoods or insulation displacement devices is preferable.*

There have been cases where the fixings of exterior halogen floodlights have failed, allowing the light to turn over and point towards the thatch, setting it alight. In the absence of more specific information, the minimum distances between a luminaire and the combustible material (in this case the thatch) stated in Regulation 422.3.1 of *BS 7671* should be observed, as appropriate to the lamp rating (in watts).

It should be noted that the guidance issued by Dorset Building Control Technical Committee for thatched buildings – 'The Dorset Model' – makes the following recommendations with regard to lighting:

- lighting should not be installed recessed into ceilings below thatch
- any light fittings within the roof space should be of the fully enclosed, bulkhead type
- external floodlights should not be located under the eaves of the thatch.

It should also be noted that it is not recommended to install central heating boilers within the loft of a thatched property.

Fire detection

As mentioned earlier in this article, thatch is designed to shed water so it can be difficult for fire services to deal with fires in a loft space. This makes early detection of a fire within the loft of a thatched building particularly important.

Within *BS 5839-6: 2013*,[1] indent g) of clause 11.2 recommends that in Category LD1[2] systems, detectors should be located in circulation areas, and heat or smoke detectors (as appropriate) should be sited in all rooms and other areas of the premises, including lofts.

This is supported by the 'Dorset Model', which recommends the installation of a domestic mains and battery powered, interlinked smoke alarm system with one smoke detector sited in the roof void.

It is important that the fire alarm system is so arranged that the triggering of a smoke detector in the roof space raises the alarm throughout the whole of the premises. One way of achieving this would be to interlink all the detectors.

Whilst the siting of smoke detectors in the lofts of domestic premises was considered in greater length in issue 26 of Switched On (autumn 2012), for lofts under thatched roofs it is further recommended that detectors are mounted on a horizontal batten fixed across the roof below the ridge, with the supply cable attached to a vertical timber and with the interconnecting wiring run in the centre of the loft. The detectors also need to be readily accessible so that they can be tested and cleaned regularly.

Chimney heat monitors and automatic fire extinguisher systems may also be specified in a fire risk assessment for a property with a thatched roof.

[1]Fire detection and fire alarm systems for buildings – Part 6: Code of practice for the design, installation, commissioning and maintenance of fire detection and fire alarm systems in domestic premises.

[2]BS 5839-6: 2013 defines a category LD1 system as a system installed throughout the premises, incorporating detectors in all circulation spaces that form part of the escape routes from the premises, and in all rooms and areas in which fire might start, other than toilets, bathrooms and shower rooms.

**Charles Chalcraft, now a thatch consultant, has been a thatcher since 1986. A member of the National Society of Master Thatchers and the Residential Property Surveyors Association, he also carries out surveys of properties, specialising in those with thatched roofs and older buildings. The images in this article are reproduced with the kind permission of Charles Chalcraft.*

Have you ever been asked...

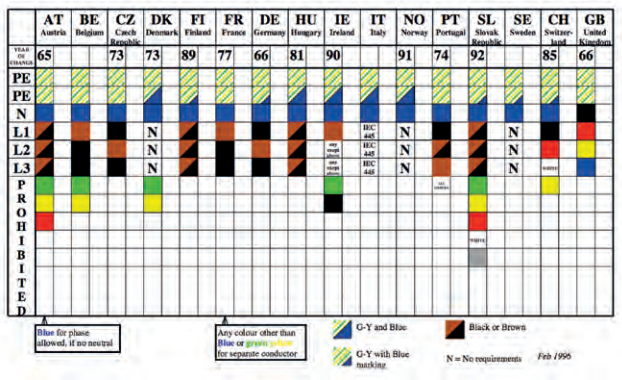
...Why did the identification colours used in the UK for fixed wiring change around ten years ago?

Although the UK agreed 35 years ago to adopt the colour blue for neutral conductors, and has since used harmonised (brown/blue/green-and-yellow) colours for the identification of the cores of flexible cables and flexible cords for electrical appliances etc, no similar move was made at the time towards harmonising the colours of non flexible cables used for fixed wiring.

We simply carried on using red, yellow and blue for the line conductors, black for the neutral, and green-and-yellow for the protective conductor.

Unfortunately, whilst for decades the UK continued to ignore the need to consider harmonising its fixed wiring colours, much of the rest of Europe had been standardising on blue for the neutral, with brown and/or black line conductors.

The following chart shows the cable colour situation across Europe in 1996, with the UK (GB) clearly being very much out of step.



Cable colours across Europe in 1996. Courtesy IET

When in 1999 it eventually became evident that, within a few years, a new European Standard (EN 60446) would by law require the use of the colour blue (rather than black) for the neutral conductors of fixed wiring throughout Europe, it became necessary for the UK to address the cable colour issue as a matter of urgency.

The Joint BSI/IEE committee responsible for the technical content of the UK standard for the safety of electrical installations (BS 7671) established a working group to consider the position the UK should take with respect to the harmonisation of the colours of the cores of non flexible cables for fixed wiring.

The working group concluded that the UK had no realistic option but to agree to use the colour blue for the neutral, and brown for the line conductor of single-phase circuits.

It also concluded that, due to the widespread adoption across the rest of Europe, the UK would also have to accept black for one of the other line conductors of a multi phase circuit.

The working group also considered there was a need to be able to distinguish between the line conductors of a three phase circuit, and decided to propose the colour grey for one of those conductors because, of the very few remaining pan European colour options, this seemed to have the least disadvantages.

The working group's recommendations subsequently formed the basis of a UK proposal which, much to the surprise of many, was accepted by the CENELEC countries of Europe almost unanimously.

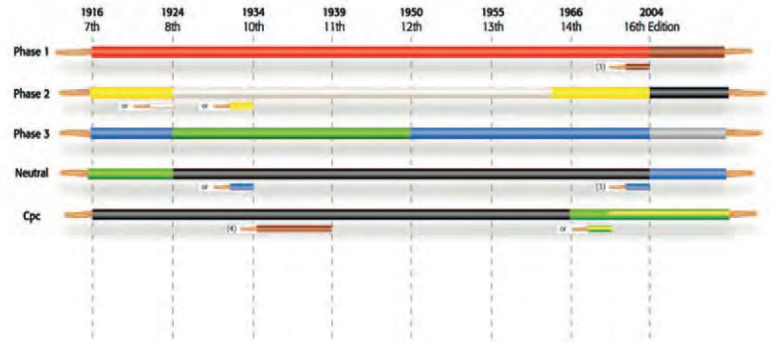
Europe then had the opportunity to fully harmonise the colour identification system not only for non flexible cables for fixed wiring, but also for flexible cables and cords, and power distribution cables.

Whilst the change in the UK to blue for the neutral and at least one black in multi phase circuits introduced the possibility of confusion with the black neutral and blue line conductor in existing three phase distribution circuits, the risk was generally considered to be manageable.

Other European countries had made similarly radical changes in their colour identification systems without undue safety problems, and the public in the UK were already familiar with a blue neutral and brown line conductor in the leads of their domestic appliances.

After all, up to about 1994, UK consumers had been expected to fit their own plug to almost every new appliance they bought!

The colours of fixed wiring in the UK had also changed radically over the previous 90 years or so as can be seen from the following chart, apparently without serious safety problems.



Cable colour specified in past editions of the IEE Wiring Regulations

So the new harmonised colours of brown, black and grey for the line conductors, blue for the neutral, and green-and-yellow for the protective conductor were introduced in Amendment No 2 to *BS 7671: 2001* (IEE Wiring Regulations 16th Edition), and became a requirement for all new electrical installation work with effect from 1 April 2004 - All Fools Day, as some gleefully pointed out at the time!

Safety of electric vehicle charging points

With the government supporting the provision of charging points at the homes of electric vehicle (EV) owners, and local authorities providing on-street EV charging facilities, the installation of EV charging points has provided a new business opportunity for electrical contractors across the UK.

But according to the website of *Source London*, the body responsible for overseeing EV charging points in the Capital, typically a third of all publicly-accessible EV charging points in the London area are out of service at any one time.

Although the specific causes are not identified this raises the question, especially if the high proportion of out of service charging points is common across the UK, as to whether all the necessary steps are being taken to maintain EV charging points in a safe condition.

In 2012, the Institution of Engineering and Technology (IET) published a Code of Practice (CoP) that aimed to provide detailed guidance on all aspects of the installation of EV charging points - from the origin of the electrical supply to the distribution and final circuits, and from the installation of the charging equipment

itself to the cable between the charging equipment and vehicle's electrical inlet.

Related issues of site layout and planning, and subsequent inspection, testing, certification and maintenance were also covered.

With regard to the inspection and testing of EV charging installations, the IET CoP simply recommends that it is carried out in accordance with the requirements of *BS 7671*, the UK standard for the safety of electrical installations.

However, those requirements apply only to the circuit from the origin of the supply up to the charging unit, not to the charging unit or its cable.

So, by complying with the requirements of *BS 7671* alone, the installer or person subsequently carrying out periodic inspection and testing cannot be certain that the charging unit will function safely and correctly when it is energised and charging a vehicle. The charging unit might have an internal fault, for example.

The IET CoP recommends that a charging point is tested to ensure correct functionality. However, it gives no guidance on how this should be achieved, and currently such guidance is not readily available from any other source either.

To appreciate some of the difficulties associated with ensuring the correct functionality of an EV charging point, it is necessary to understand how such points are designed to operate, including the electrical protection they incorporate.

A 'Mode 3' charging point, the type most commonly installed at domestic premises and on-street, incorporates an element of intelligence that enables it to communicate with a connected vehicle to establish, for example:

- if the charging cable is correctly connected physically
- if the polarity is correct
- the rating of the charging cable
- an appropriate charging cycle for the battery
- whether the vehicle battery is of a type that requires ventilation.

However, the functionality of a charging point's electrical protection cannot be checked unless either an electric vehicle is connected, or an appropriate test instrument is used that simulates the connection of an electric vehicle.

Such an instrument would need to simulate the signal which, when received by the charging point, initiates the sequence that closes the contactors to energise the charging circuit, enabling testing to be performed.

So there is a question as to why an EV charging point, which is a high energy source relying on relatively complex electronics, is not required to be tested for safety in a more comprehensive manner, in addition to the requirements of *BS 7671*.

EV charging points also incorporate an RCD intended to provide protection in the case of an earth fault, together with monitoring device to ensure adequate continuity of the protective conductor in the charging cable.

Yet the IET CoP does not call for the RCD to be tested to the same extent as other RCDs in an electrical installation - its recommendation is check the operation of the RCD by only using the test button.

With government continuing to encourage the uptake of electric vehicles and the growth of the charging infrastructure they need, it is more important than ever that both privately-owned and publicly-accessible charging points are correctly installed, and appropriately inspected, tested and maintained to ensure their initial and ongoing safe operation in the interests of both users and passers-by.

In summary, there is a clear need for further consideration to be given to the requirements for the inspection and testing of EV charging points necessary to confirm their continued safety and functionality.

Electrical Safety First therefore intends to develop detailed safety proposals to put to JPEL/64, the joint BSI/IET committee responsible for *BS 7671*, for possible inclusion in a future amendment to that standard.

We would like to thank Seaward for their assistance in the drafting of this article.

Company prosecuted after repeated failure to act led to an electric shock

In January, a company was prosecuted at Derby Magistrates' Court following an incident in which a 16-year-old hotel employee suffered an electric shock from a commercial dishwashing machine.

The employee, who worked at the Stuart Hotel in London Road, Derby, received the electric shock in September 2013.

An investigation by environmental health officers from Derby City Council found that, despite the dishwasher first being reported faulty over two months earlier and the fault being reported and documented by staff on 11 occasions in the hotel's maintenance log book, Ridgesilver Ltd of Georgian Way, Harrow, Middlesex, had failed to have the machine repaired.

The investigation also found that the injured employee had been taken on without a specific young person's risk assessment being carried out.

Ridgesilver Ltd pleaded guilty to four offences:

1. Failing to ensure, so far as is reasonably practicable, the health, safety and welfare of employees [*The Health and Safety at Work etc. Act 1974*, Section 2(1)]

2. Employing a young person without making an assessment of health and safety risks [*The Management of Health and Safety at Work Regulations 1999*, Regulation 3]

3. Failing to ensure that the operation and use of a commercial dishwasher was carried out in such a manner as not to give rise, so far as was reasonably practicable, to danger [*The Electricity at Work Regulations 1989*, Regulation 4(3)]

4. Failing to ensure that no person was engaged in any work activity on or so near any live conductor, namely a live conductor in a commercial dishwasher, that danger may arise [*The Electricity at Work Regulations 1989*, Regulation 14]

Ridgesilver Ltd was fined £30,000, and ordered to pay costs of £11,977 and a victim surcharge of £120.

Speaking after the case Councillor Rawson, Deputy Leader and Cabinet Member for Planning, Environment and Regeneration at Derby City Council said: "It is important that all businesses take health and safety seriously and ensure that risks in the workplace are effectively controlled.

"Ridgesilver Ltd knowingly allowed a faulty dishwasher to be operated for a sustained period of time, exposing several of their employees to a risk of electric shock which could have caused serious injuries, burns or could have been fatal.

"It was therefore important that we took legal action against Ridgesilver Ltd, given the disregard for the health and safety of its employees in this instance."

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www.electricalsafetyfirst.org.uk/switchedon