The invisible killer

Electrical safety in the food and drink industry

GUIDANCE FOR ELECTRICIANS

Contents

Introduction

Electricity has been used commercially for over 100 years and has transformed our workplaces. It's difficult to imagine modern life without it. Used properly, electricity is both safe and extremely useful.

HSE-sponsored research in 2010 revealed that electrical fitters in the electrical wiring installation industries suffer the largest number of accidents involving electricity. So it's electricians who are most at risk from electricity-related accidents.

The data also showed that contact with electricity results in the highest number of fatal injuries, with an increasing number of fatal injury accidents reported for workers aged 40 to 55.

This training package is aimed at electricians working in the food and drink industry. It will explain the hazards and controls that must be put in place to protect electricians working in these environments.

It's not a substitute for training on your employer's electrical safety rules. However, it will support and raise awareness of what should be in place.

This training package draws on guidance contained in the Electricity at Work Regulations 1989. It is supported by the IOSH Food and Drink Group, which has produced this free resource to support the promotion of high standards of electrical safety across the food and drink industry.

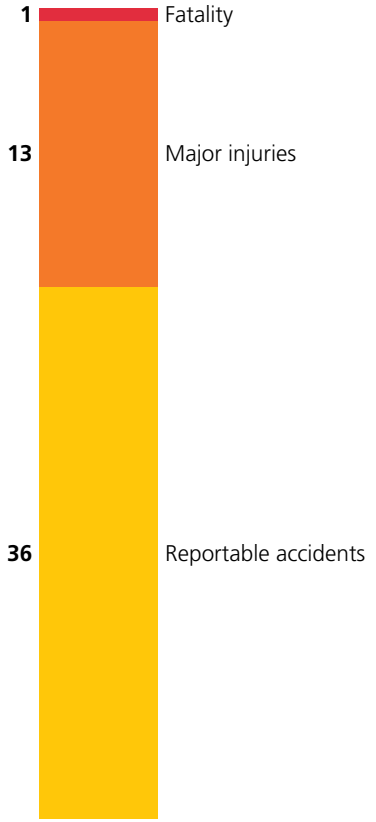
Hazards

You may encounter many hazards while performing your duties as an electrician. Electrical hazards in particular pose a risk to your safety and can result in shocks, burns from electrical arcing and fires.

DID YOU KNOW?
Electrical burns can take an extremely long time to heal – sufferers often have to remain in hospital for weeks or even months.

Injuries caused by electrical accidents can be horrific. In the UK, you're 10 times more likely to die from an electrical accident than from accidents due to other causes.

The ratio of fatal to major and reportable injuries from electrical causes is illustrated below.



Electrical accidents – facts and figures

Most electrical accidents occur because electrical workers are working on or near equipment that is:

- thought to be *dead*, but is in fact live
- known to be *live*, but those working on it have inadequate training or inappropriate equipment, or haven't taken the right precautions.

Sixty-eight per cent of reportable electrical accidents are due to inadequate working practices, 19 per cent are due to a failure to maintain electrical equipment and 13 per cent have miscellaneous causes.

68% Inadequate safe working practices

19% Failure to maintain electrical equipment

13% Miscellaneous causes

Competence

In terms of safety, competence is a combination of knowledge, skills and experience to enable a person to avoid danger. Everyone working with electricity must have the necessary competence to do the work they've been asked to do. This includes any contractors we invite to work on our sites.

Employers must formally assess and authorise electrical workers on their sites.

Electrical workers should be trained on the site's electrical safety rules, and contractors should be informed of these during their induction.

Employers should also appoint an electrical duty holder to advise on and manage electrical risks on site.

DID YOU KNOW?
Two-thirds of electrical accidents are due to inadequate safe working practices, so competence – including training – is key.

The normal contractor controls, such as vetting and the approval of risk assessments and method statements, also apply when you're employing electrical contractors.

The electrical duty holder

The ultimate electrical duty holder is the most senior person in the company or a specifically allocated board member, but the role is very often given to a sufficiently qualified and experienced competent person. The electrical duty holder needs to be in a managerial position, have sufficient authority 'to stop the job' and be given adequate resources to discharge their duties.

The duty holder should:

- control all operations, maintenance and new works on electrical systems
- appoint competent people to carry out any electrical work (both directly employed and contractors)
- ensure that adequate electrical safety rules are in place and that competent people are briefed on those rules
- approve specific tools and equipment
- highlight deficiencies to the site's senior manager.

Competent people have a key role to play and should work within the site's electrical rules. Always use the safe procedures, equipment and protective clothing you've been trained on, and report any safety concerns to your manager.

You should set a good example to others by always working in a safe manner, as you have the skills and experience in electrical safety which others may not. This particularly applies to any apprentices or young people in your care.

DID YOU KNOW?
You're the *electrical safety leader* and must take responsibility for working safely and not putting yourself and others at risk.

The right tools for the job

Electrical workers must have the right tools for the job and the correct personal protective equipment (PPE), such as rubber gloves and eye protection. The protective clothing must be worn wherever necessary, as identified by the risk assessment for the task.

Safe procedures – working dead

The principal requirement when working with electricity should be *dead* working. The authorised and competent electrician should make circuits safe to work on. The six steps required are shown below.

Isolation checklist

Step 1 Identify, isolate and make dead	From all points of supply. Isolation and reinstatement must always be in agreement with the users
Step 2 Prevent re-energisation	By locks, retention of fuses and links or other means
Step 3 Apply caution notices	Apply caution notices to all points of isolation
Step 4 Prove dead	Using an approved voltage indicator, check all poles of supply. Prove dead at the point of work, check voltage indicators before and after test
Step 5 Post danger notices	Identify adjacent live equipment in the work zone and prevent access. Apply danger notices to all adjacent live equipment
Step 6 Issue permit to work	If required, for example when isolating electrically for others

When isolating for someone else, you should issue a permit to work so that they know the circuit has been made dead and is safe to work on. You'll also need to issue a permit when you carry out a complex isolation or where there's more than one person working on the equipment.

Special circumstances – live working

Live work should only be permitted in special circumstances by authorised, competent electricians.

Live working includes:

- proving circuits are dead
- testing and running adjustments
- working on dead circuits adjacent to live energised circuits
- testing and inspecting live low-voltage circuits.

This list is not exhaustive and there will be other circumstances where live working takes place. If in doubt, consult your manager.

Before any live work is undertaken, a risk assessment must be carried out in accordance with Regulation 14 of the Electricity at Work Regulations 1989.

The live working risk assessment must consider:

- if it's unreasonable in all circumstances for the work to be carried out *dead*
- if it's reasonable in all circumstances for the work to be carried out while the equipment is *live*
- if suitable precautions (including the provision of suitable protective equipment, where necessary) have been taken to prevent injury.

All of these three conditions must be met before live work is allowed.

If work must be undertaken live, then controls must be put in place, including:

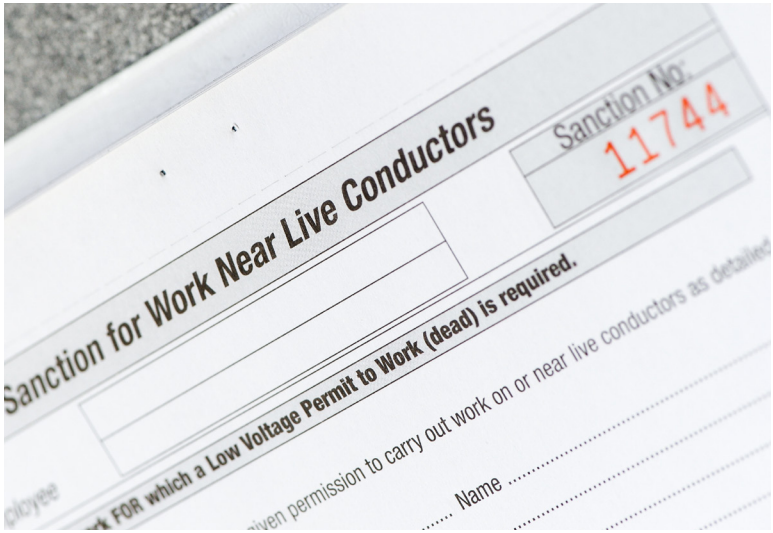
- ensuring the person undertaking the work is competent
- preventing unauthorised people from entering the area
- making sure the area is clean, dry, tidy and well lit
- considering vehicular traffic in the area
- considering if the work is being undertaken at height
- ensuring the right equipment is available to do the job safely
- ensuring the right PPE is available and specified
- considering if the work needs an accompanying person
- considering the condition of, and power in, the panel and whether there are any rogue electrical supplies.

In some very high-risk circumstances, a sanction to work should be issued by a senior competent person following a risk assessment of the work. The sanction to work confirms the work has been thoroughly assessed, and describes and confirms the controls that are in place. A sanction might be issued, for example, while working on conductors that are adjacent to other live low-voltage conductors. The sanction would confirm that all people were aware of the live conductors and that appropriate controls, such as temporary shielding, had been put in place.

Cable jointing and manipulating or connecting live components should be prohibited.

Working on or near live equipment, or where there are any doubts about its condition, should also be prohibited.

DID YOU KNOW?
Many electrical accidents occur because the circuit is known to be *live* but those working on it don't have adequate training or appropriate equipment, or haven't taken the right precautions. Don't be a statistic. Assess the risks…



Installation standards

It's essential that equipment is properly installed so as to avoid danger. Any electrical installation should be designed, constructed and commissioned by suitably competent people in accordance with the IET Wiring Regulations BS 7671.

New panels should be installed to Ingress Protection rating 2X (IP 2X), which means that the equipment is finger-safe. There should be robust segregation of all power and control circuits and the control circuits should be extra low voltage. Existing panels should be inspected for defects and a prioritised programme put in place to upgrade where necessary.

All equipment should be properly earthed and bonded, and maintained to the highest standards. Remember that in the food industry, where there are very wet environments, even small touch voltages between simultaneously accessible metalwork can be fatal. Don't leave any unsafe conditions that could endanger your colleagues.

Once a contractor has carried out an installation, a full inspection and test should be undertaken to make sure the standards are upheld. Even for minor works, a certificate should be demanded and kept on record.

Residual current devices (RCDs) are highly recommended for equipment used in wet areas. These devices will disconnect the supply where a fault current is detected. They operate faster than circuit-breakers and are designed to protect workers in the event of a fault. Their disadvantage is that they're mechanical devices and can be prone to failure, so they must be tested regularly. RCDs should never be a back-stop for poor quality installation and earthing standards.

Responsibilities

As an electrician, you're a custodian of the standards. Because of your knowledge and expertise, you should set a good example on electrical safety by following the safe procedures.

It's important to remember that you're responsible for the electrical safety of other people's environments, including non-electrical workers. Make it your policy to provide the highest standards of work and never to leave electrical work in an unsafe condition, even on a temporary basis. Areas and equipment should always be left safe for your electrical colleagues and others working at your site.

You must also have the confidence to draw your manager's or electrical duty holder's attention to hazardous situations, highlighting anything you consider unsafe.

Summary

DID YOU KNOW?
In the UK, one in 50 electrical accidents at work results in a fatality, compared with one in 600 from other causes.

You're 10 times more likely to die from an electrical incident than from an incident due to another cause.

It's important for your safety and for the safety of others that you follow safe working procedures and install equipment to the right standard.

Make sure that you:

- understand and follow the electrical safety rules in your organisation
- have the correct equipment and tools available
- have the correct personal protective equipment (PPE) and use it when required
- understand the procedures for working dead
- understand the rules for working live
- leave the work area safe for others
- report any defects to your manager.

Above all, respect electricity and don't accept that shocks and even burns are an occupational hazard.

This training package explains some of the principles of working safely with electricity, which are underpinned by the Electricity at Work Regulations 1989 and supporting guidance. This guidance is listed in the next section and is recommended for further reading.

Guidance and further reading

1 The Electricity at Work Regulations 1989.

2 Memorandum of Guidance on the Electricity at Work Regulations 1989. Guidance on Regulations. HSR25. 2007.

3 Electricity at work: safe working practices. HSG85. 2013.

4 Electrical Safety Council. Guidance on the management of electrical safety and safe isolation procedures for low voltage installations. Best Practice Guide no. 2 issue 2. 2009.

5 Institution of Engineering and Technology. IET Wiring Regulations. 17th edition. BS 7671:2008, incorporating amendment no. 1, 2011.

The IOSH Food and Drink Group has nearly 1,000 members working in the food and drink manufacturing, bottling and canning industries.

As part of our work to share good practice, we run an awards scheme, support the national 'Recipe for safety' initiative, organise networking events and produce good practice guidance on issues specific to our industries.

For more information contact **networks@iosh.com**

Free videos and guidance are at **www.iosh.com/electricalsafety**.

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