

# Electrical safety at places of entertainment

Guidance Note GS50 (Third edition)

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This guidance contains advice on preventing electrical danger at places of entertainment.

It is primarily for managers of places of entertainment, and for people who provide facilities for entertainers. It will also be of use to technicians and technical managers.

It outlines the risks and describes the law that applies, as well as the role of the enforcing and licensing authorities. There is general advice on managing electrical safety, and specific advice on ways to prevent electrical danger.

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## Introduction

1 Electricity can kill. There have been a number of electrical accidents, including fatalities, at places of entertainment. This guidance note contains advice on preventing electrical danger, on the law as it applies to entertainment, and on the role of the enforcing and licensing authorities. It does not deal with the optical risks from lasers.

2 The guidance is intended primarily for the managers of places of entertainment and for people who provide facilities for entertainers. It will also be of use to technicians and technical managers. A separate leaflet covers risks to entertainers.<sup>1</sup>

3 The guidance is in three parts. Paragraphs 4–12 outline the risks and your legal duties. Paragraphs 13–19 give general advice on managing electrical safety. Paragraphs 20–58 give more specific advice on ways to prevent electrical danger.

## Risks

4 Most entertainers make use of electrically powered audio, lighting or other equipment. Equipment which is damaged, faulty or poorly installed can cause electric shock, burns or fire.

5 Electric shock has a variety of effects on the human body (see Figure 1). Mild shocks cause an unpleasant tingling sensation; more severe ones cause muscle contractions, interfere with breathing and can upset the heartbeat; and severe shocks cause extensive burns and are usually fatal.

6 Electric shock is the result of current flowing through the body; the more current that flows, the greater the likelihood of harm. How much current flows through the body will depend on the shock voltage. Voltages in excess of 50 volts alternating current (or 120 volts direct current) should be regarded as dangerous even in cool, dry conditions.

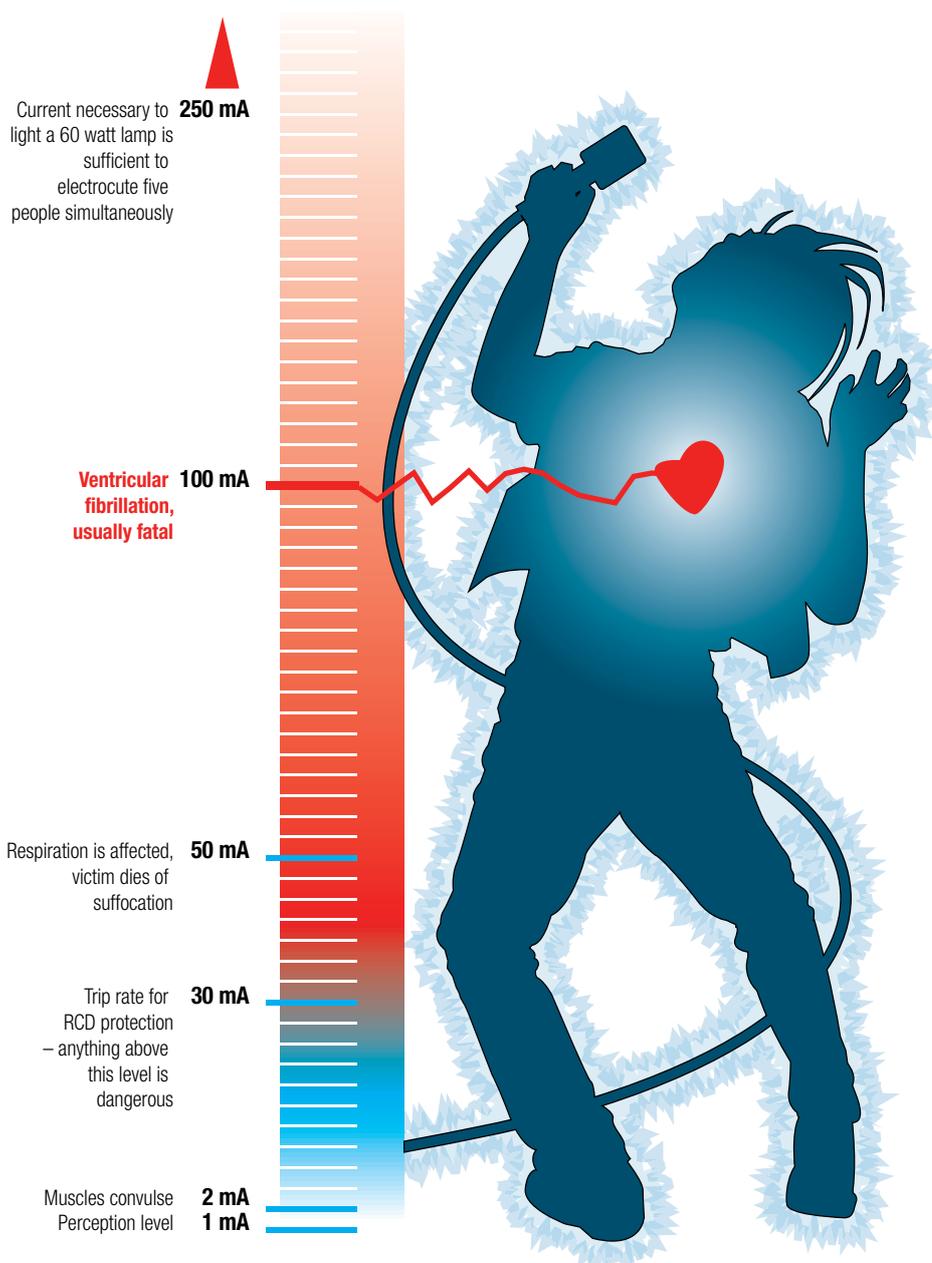
7 To be on the safe side, parts live at over 25 volts AC or 50 volts DC should be insulated or enclosed at all times to prevent anyone touching them. Where insulation and enclosures etc are kept in place, risk can still arise from an item of equipment (such as a flexible cable) which is:

- damaged, exposing bare live wires; or
- wrongly connected, making exposed metalwork live.

8 Both these have caused accidents at places of entertainment. The risk may be increased because instruments and microphones are often hand-held and, if they become electrically live, the user is unable to let go.

## The law

9 The law places duties relating to health, safety and welfare on employers, employees and the self-employed. For example, the person controlling the venue, whether an employer or self-employed person, has a duty to organise events in a way which does not put the health or safety of employees, visiting entertainers or members of the public at risk. Similar duties apply to those who allow their premises to be used as a place of entertainment.



**Figure 1** Relative magnitude and effect of electric current

10 A summary of the main relevant legal requirements is given in Appendix 1, along with information about the agencies responsible for enforcing the requirements.

## Licensing

11 Virtually all public places of entertainment require a licence from the local authority. The legislation does not specify what should be contained in the licence. It can and often does include conditions relating to electrical safety, such as the provision of residual current devices (RCDs).

12 Similar licensing requirements may apply to other entertainment venues (church or school halls etc). If in doubt, consult the local authority about the need for a licence, and about any conditions which might apply. The fire authorities may also be involved in the licensing procedure.

## Managing electrical safety

13 Electricity has a jargon all of its own. You may be competent to deal with all electrical matters. But if you are unclear or find electrical matters confusing, then you should use the services of a competent person to ensure electrical safety in your premises. (The phrase 'competent person' in this guidance means a qualified electrician or someone else who understands the dangers and has the skills necessary to undertake electrical work safely.)

14 It is important you take positive steps to manage electrical safety, not just react to accidents or situations as they occur. For example, equipment should not be left until a fault occurs – the aim is to prevent danger. If faults are not found until equipment is being set up for a performance, it may be too late to repair or replace it.

15 The Management of Health and Safety at Work Regulations 1999 require you to assess the risks, including electrical risks, in your premises. In practice, this means considering whether installations and equipment are satisfactory, or whether they pose any significant risks to those using the premises. Where there is a risk of harm to people, action needs to be taken to remove, reduce or control the risk.

16 The first stage in controlling any risk is to determine what needs to be done. The following simple approach<sup>2</sup> will help you determine what is necessary:

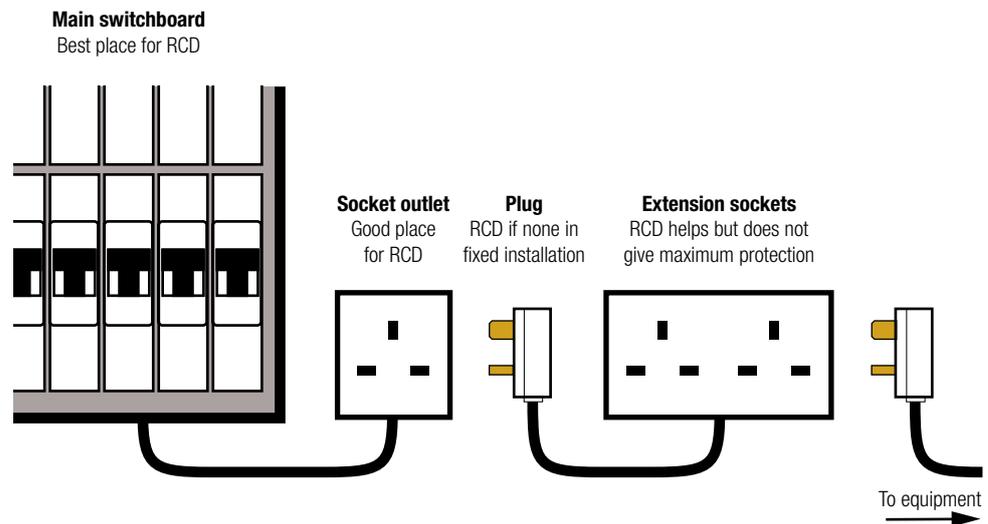
- **Identify the hazards:** Look closely at what might cause harm or injury (eg inadequate, incompatible, damaged, poorly installed electrical equipment or installations).
- **Decide who might be harmed and how:** Remember to consider employees and others who might be affected, such as performers or members of the public.
- **Evaluate the risks and decide on precautions:** Consider whether existing precautions are adequate. If they are not, decide what further measures need to be taken to remove, reduce or control the risk.
- **Record your findings:** If you have five or more employees, you must record any significant findings. It is important to do this as it can help inform others of hazards, and gives a record against which to compare future assessments and findings.
- **Regularly review your risk assessment:** Check it is still relevant if you make changes to your installation or change equipment or working procedures. These may introduce new hazards. Revise the assessment if necessary.

17 Following this planned approach will help you determine whether the electrical installation and equipment are safe, and whether you have taken all reasonable steps to control electrical danger.

18 Many risks can be controlled by implementing simple procedures to ensure safety. For example:

- ensure that the electrical installation as a whole is designed, installed and maintained in accordance with BS 7909<sup>3</sup> and BS 7671;<sup>4</sup>
- ensure only those who are competent are permitted to undertake electrical work on installations and equipment;
- ensure installations and equipment are properly insulated and correctly earthed;
- do not rely on other people's equipment being in a safe condition or properly connected. Check before it is used;
- make appropriate use of residual current devices (RCDs) (see Figure 2);
- do not use or connect incompatible items of equipment;
- ensure problems are dealt with in the right way;

- introduce a planned preventive maintenance programme for the electrical installation and equipment;
- undertake simple visual checks to ensure the electrical wiring and connections are in good condition;
- ensure maintenance, inspection, testing and repairs are only carried out by someone who is sufficiently competent for the work involved.



**Figure 2** Where should the RCD be?

19 Performers and touring companies may well bring electrical equipment of their own. Ensuring that it is connected and used safely requires close co-ordination and co-operation between all the parties concerned. As the manager/supplier of the venue you are likely to have overall control of the site and are in the best position to take responsibility for co-ordinating health and safety activities.

## Preventing electrical danger

20 This section outlines common-sense ways of preventing electrical danger. Much of the advice is easy to understand, though some of it is more technical. If you are at all unclear about the content, then discuss this section with a competent person.

### Power supplies and power distribution

#### **Fixed installations**

21 Fixed installations should have adequate provision for equipment to be connected, in terms of power (kW) and numbers of sockets. Indoor sockets will normally be of the 13 amp type (to BS 1363). If higher power requirements are likely to be needed, provision of one or more industrial-type 32 amp outlets to BS EN 60309 is recommended.

22 Great care is needed if the equipment is to be supplied from a three-phase supply or if adjacent items are fed from different phases. Many local authorities have their own rules on this topic. They should be consulted.

23 The primary means of protection against electric shock should be by adequate insulation and correct earthing of external metal parts. Take the following steps to help reduce the risk of electrical accidents:

- Do not bypass protective devices (such as circuit breakers or fuses) if the power supply does not meet the demand imposed by the lighting and sound installation. Provide sufficient power.
- Protect sockets for audio equipment with Type A or Type B RCDs having a tripping current of 30 mA.
- Locate RCDs in readily accessible positions at the sub-circuit distribution board level to get maximum benefit (each RCD can protect a maximum of six sockets).
- Check with the person responsible for the premises whether the relevant circuits from the switchboard are RCD protected. If these are not already provided or the person is unsure about whether this protection is present, you can use an RCD-fitted plug or adaptor.
- If socket outlets with integral RCDs are used, ensure all sockets in the performers' area are protected.
- Only rely on a portable RCD adapter or RCD plug when there is no better alternative (they can easily be ignored or bypassed, but are better than nothing).
- Operate the RCD test button at least monthly and test it annually, eg in accordance with BS 7671.<sup>4</sup>
- If a 30 mA RCD trips, it is an indication that there is a fault. Do not ignore it.
- Equipment which causes an RCD to trip should be taken out of service until the fault is found and put right.

24 It is not essential for electrical supplies to indoor lighting to be RCD protected as, in some cases, it can lead to problems (see paragraphs 44–51). However, it should be considered where low-level lighting is moved during a performance.

25 The fixed electrical installation in a place of entertainment must be maintained to prevent danger. This can be achieved by having the installation inspected and maintained by a competent person at suitable intervals.

26 Frequency of the inspection/test will depend on the standard of the installation, its usage, age and condition, and the type of premises it is located in. Advice on this can be found in the Institution of Engineering and Technology (IET) *Guidance Note Number 3 to the Wiring Regulations*.<sup>5</sup> Keeping records will help show whether there is an increase or decrease in the number of faults found. This will help determine whether to increase or decrease the frequency.

27 Where there is a temporary supply for the duration of an event, great care must be taken to see that the temporary arrangements are safe. Advice on temporary electrical installations can be found on HSE's website under event safety ([www.hse.gov.uk/event-safety/index.htm](http://www.hse.gov.uk/event-safety/index.htm)).

#### ***Independent supplies: generators***

28 Many events take place in buildings which are already suitably equipped with lighting etc. However, entertainers will usually provide their own instruments and, in some cases, amplifiers and effects units. Entertainers with large amounts of equipment will often need more power than is readily available locally and will, therefore, use power generation equipment. Some venues have no electrical supply and will also need power generation. These will usually take the form of mobile generators.

29 The main means of protection against electrical shock should be by using a well maintained generator which is correctly installed and adequately earthed. This affects the safety of the whole installation, so it should only be installed by someone who is competent to do so.

30 If you are hiring the generator(s) you will have to arrange for a competent installer. If the equipment is being supplied by the entertainers, you should check they have someone competent to do this work. You might also ask to see evidence that the equipment has been inspected and/or tested and confirmation that the earth resistance test undertaken, on installation, is satisfactory.

31 It should not be possible to connect the generator(s) in parallel with the public supply system, unless written agreement has been reached with the electricity supplier.<sup>6</sup> The electricity supplier will set out the arrangements necessary for you to ensure safe connection.

32 If there is more than one generator and they are to be operated in parallel, the system should be designed so that the load is shared between them.

33 Unless the generator is supplying only double insulated equipment within a few metres of itself, there is a risk that a fault in the equipment, the cables or the generator could cause the equipment casing to become live without blowing the fuse or tripping any circuit breakers. To avoid this, one point (usually the neutral or star point) of the generator output circuit should be earthed, and bonded to the structural steelwork of the building and any scaffolding etc which may carry electrical equipment.

34 At outdoor venues earthing should be by earth rods. Indoors, the generator star point (or neutral) should be connected to the system main earth of the fixed installation. The earth resistance must be low enough for the earth fault protection to operate reliably. It is strongly recommended that it is tested by the electrician who installs the generator. Keeping a record of this test is a good idea. It can be used as a management tool when ensuring all safety checks have been made before a performance begins.

35 None of the conductors connected to earth or neutral should have single pole fuses or switches in them. Particular attention should also be paid to the conductor connectors as accidental disconnection will not normally be obvious (eg by the equipment failing to work).

36 An RCD will provide additional protection in a system which is connected to earth. However, the manufacturer's advice should be sought before installing an RCD where there is vibration, such as on a generator.

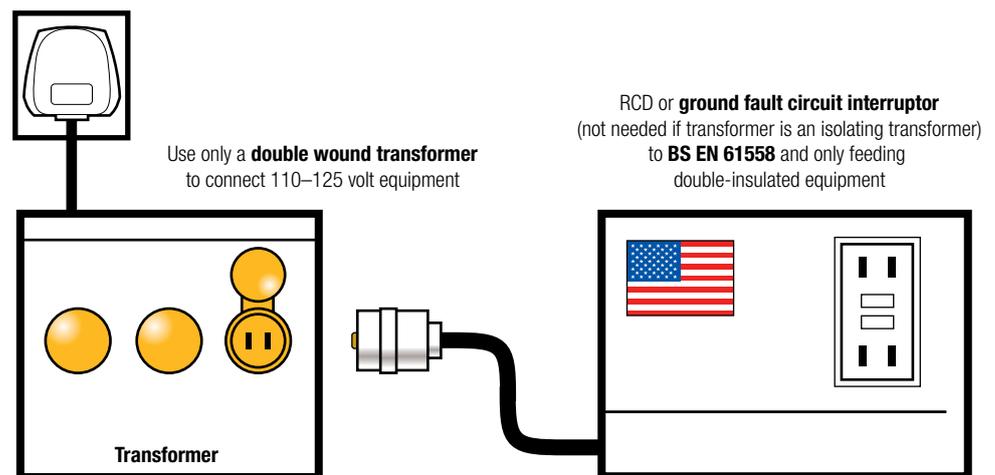
37 If single-core cables are used, the electrical installation should be undertaken by someone with suitable technical knowledge and experience. Single-core, heavy current cables should be insulated for the voltage in use and adequately protected against mechanical damage. Steel armoured, single-core cables should not be used (induced currents in the armouring can cause the cable to overheat). Welding cable must not be used as it is not adequately insulated. Plugs and sockets for single-core cables should be arranged so that there is no risk of contact with bare live parts, even with a plug withdrawn.

38 To prevent contact with live parts, connection cubicles should:

- be locked (accessible only to a responsible person); or
- interlocked, so that they disconnect the power before/as they are opened.

## 110–125 volt supplies

39 Some types of equipment, including much from the USA, may be designed only to work on supply voltages in the range of 110 to 125 volts. To operate such equipment safely, it should only be supplied through a double wound (isolating) transformer (see Figure 3). A single winding auto-transformer should not be used. This is because the output of an auto-transformer may provide 110 volts to the equipment, but it is still 230 volts above earth potential. The equipment is unlikely to have been designed to operate in this way.



**Figure 3** 110–125 volt American equipment

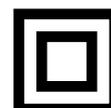
40 Though the voltages are lower, those over 50 AC should still be treated as lethal (see paragraph 7). The following precautions will help to help reduce the risk:

- Unless the transformer is a safety isolating transformer to BS EN 61558 (or IEC 742), the neutral of the output circuit must be efficiently connected to an effective earth – this may be the protective (earth) conductor of the 230 volt mains supply, or a good earth rod.
- The earthing conductor should be at least as large as the phase and neutral conductors of the primary circuit. If a 'signal clean' earth is also being used for electrical protection, it must be tested as being suitable for this purpose.
- Safety isolating transformers (to BS EN 61558 or IEC 742) having a secondary circuit which is unearthed should only supply Class II (double insulated) equipment within a few metres of the transformer.
- Where the transformer secondary has been earthed, fit an RCD (known in the USA as a ground fault circuit interruptor) in the secondary circuit.
- The transformer output(s) should also have overcurrent protection (fuses or, preferably, circuit breakers).
- Standard 230 volt plugs should not be used on lower voltage equipment because of the danger of wrong connection.
- 120 volt lamps should not be used in series on a 230 volt supply unless the light fittings are designed for 230 volt operation.
- If in doubt seek the advice of a qualified electrician.

## Equipment

### General

41 Most electrical equipment is either housed in a box with metal panels, which are intended to be earthed (Class I), or housed in an electrically insulated box (Class II – double insulated, and likely to be marked with the symbol in Figure 4). With Class I equipment the metal panels are earthed to ensure the fuse blows if certain faults occur, eg if the mains wiring makes contact with the panels. If the earth is removed or disconnected the metal panels may become live. Anyone who touches them could receive a serious electric shock and/or the equipment may be seriously damaged.



**Figure 4** Symbol for double-insulated equipment

42 If, as a result of an insulation failure, dangerous earth leakage currents flow; a correctly rated and installed RCD should detect this and trip the circuit. If a 30 mA RCD trips it is an indication there is a fault. Do not ignore it. Take the equipment out of service until the fault is found and put right.

43 If there is a need to temporarily bypass or disable an RCD, then devise and adopt a well supervised safe system of work for this. Reinstate the RCD as soon as possible. See BS 7970 for further guidance on bypassing and disabling RCDs.

### Lighting systems

44 The industry tends to use 15 amp three round pin plugs and sockets to BS 546, a type which is generally regarded as old fashioned in other applications, but is satisfactory for this purpose. High-power lights, eg 5 kW follow spots, need higher power sockets, usually 32 amp industrial-type to IEC 309 (previously BS 4343, now BS EN 60309).

45 For new installations or when replacing old equipment, it is recommended that plugs and sockets to BS EN 60309 are used. These have better cord grips, are often tougher, and cost less.

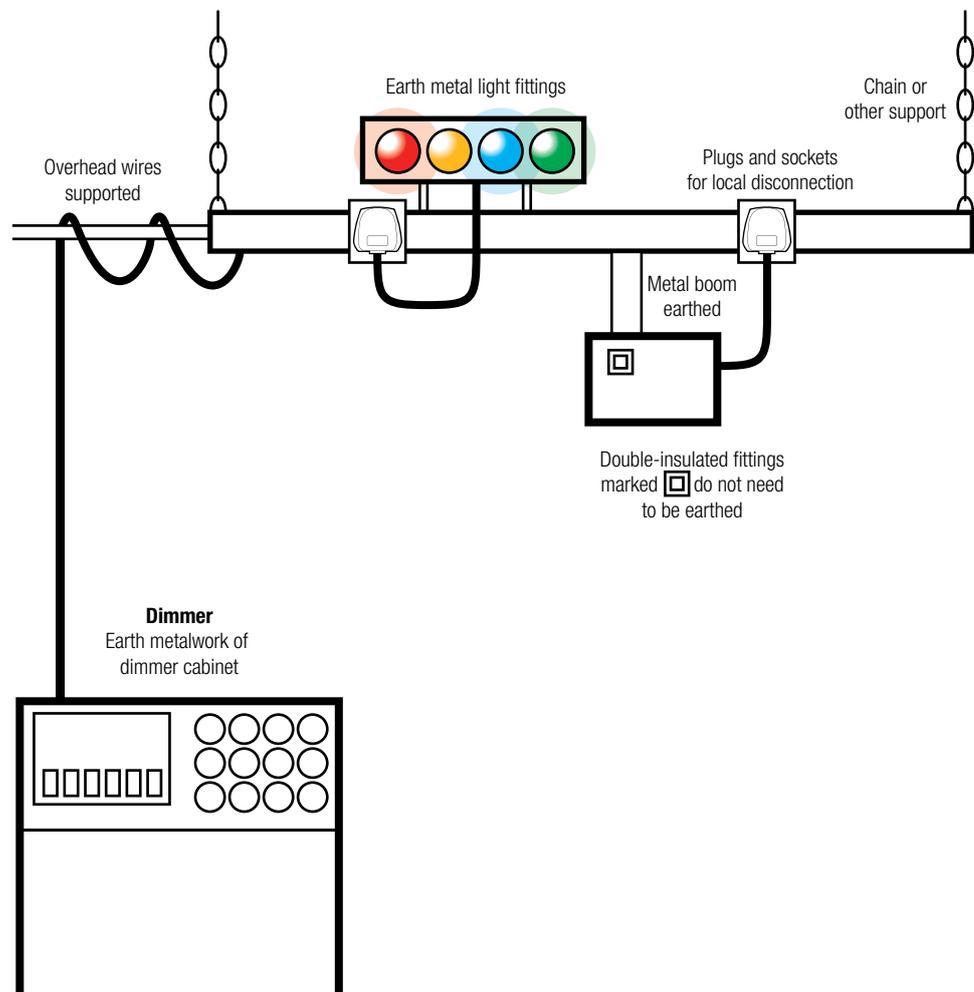
46 Power cables from the lighting booms to the dimmer cabinet or control cubicle should be suitable as regards flexibility and protection against abrasion or other mechanical damage. If there is any risk of the cable being affected by the heat from the lamps, it should be of a heat-resisting type or suitably protected against the effects of heat.

47 Any plugs and sockets used should also be adequate in terms of voltage, current ratings and conductivity; the protective earth connection is particularly important.

48 The following precautions will help to reduce the risk of electrical accidents involving lighting (see Figure 5):

- Lighting circuits (even if the connection is by a plug and socket) should be kept separate from circuits which will be used for audio equipment.
- The hoists for lighting bars and booms should normally be supplied by a separate circuit.
- Only a single phase should be supplied to any one boom and the connections from the individual light fitting to the boom should be by plug and socket.
- Flexible cables should be properly secured in a cable grip at the plug or termination.
- Light fittings should not normally be suspended from a flexible cable alone (use a chain or other support).

- Lighting rigs should be out of reach of performers and the audience (unless designed specifically for use at low level).
- The metalwork of individual light fittings should be adequately connected to the protective earth conductor.
- Scaffolding, metal frameworks, bars and booms on which electrical equipment is fixed should be efficiently earthed.
- If earthing connections are looped, the conductor size should be adequate throughout its length.
- If lighting is connected to two or three phases of the electrical supply, the dimmer cubicles on different phases should be clearly separated to avoid confusion.
- All the exterior metalwork of the dimmer control cubicles should be properly earthed (to ensure the earthing of booms and light fittings).
- There should be no provision in lighting control cubicles for 'lifting' (disconnecting) protective earths.
- If the earth leakage current is excessive the problem should be located and cured at source.



**Figure 5** Indoor lighting: points to watch

49 Some types of lighting dimmer control have a relatively high earth leakage, so if sensitive residual current protection is fitted to the lighting circuits it will often be necessary to fit a number of RCDs (at sub-circuit level) rather than a single overall RCD. A single RCD might trip frequently. A single RCD also has the added disadvantage that all the lights will go off at once if it trips, resulting in increased risks of slips, trips and falls in the dark.

50 Some dimmer controls produce a direct current which can prevent some types of RCD working properly. This is another good reason for making sure that the lighting is not fed from the same circuit as the audio equipment, which needs reliable RCD protection. Where low-level lighting is moved during performances or is handled by performers, eg a table lamp in a play, an RCD on the output side of a dimmer may provide additional protection. However, some RCDs that contain electronic components do not operate satisfactorily at voltages much lower than 230 so the additional protection may be ineffective. Consult the RCD manufacturer before using an RCD on a voltage lower than the rated value or on direct current applications.

51 Lasers, strobes and other high-intensity lighting may require special arrangements or approval from the licensing authority before use. As well as non-electrical risks such as radiation or the risk to epilepsy sufferers from such equipment, some of these items use high voltages internally. It is therefore particularly important that they are in good condition and, where necessary, properly earthed. Setting up such equipment is a specialist job normally carried out by specialist companies.

### **Sound systems**

52 Sometimes it may be necessary to site a mixing desk at some distance from the power amplifiers, interlinked by multi-core signal cables. Microphones etc may have their own power supply (not phantom-powered from the mixing desk). The output terminals of amplifiers, the wiring to loudspeakers and the connectors on loudspeakers may carry dangerous voltages. Wiring with adequate insulation should be used, and any connectors should be safe for use at that voltage and current.

53 Audio equipment should, if properly maintained, present few problems. However, when a number of items are used close together, or are interconnected, problems can occur, such as 'mains hum', often caused by multiple earth paths. The following precautions will help to avoid such problems and ensure that equipment is used safely:

- It is preferable that different parts of the sound system should be powered from the same phase of the electricity supply.
- Mains-powered equipment should either be double insulated (the equipment is likely to be marked ) or correctly fitted with a protective earth.
- If there is any doubt about the mains connections of equipment consult a qualified electrician.
- If a buzzing noise occurs on the system ('mains hum') **do not remove protective earth connections.**
- Rearranging the equipment so that mains leads do not criss-cross can eliminate mains hum.
- Properly designed equipment should not cause hum (although in some cases it may be necessary to disconnect the screen at one end (only) of interconnecting audio cables).
- When buying or renting new equipment consult the supplier about hum (some equipment has a facility for disconnecting the 'signal' earth from the protective earth without affecting safety).

54 Many electrical accidents, including fires caused by equipment being incorrectly used or faulty, can be readily prevented by taking simple precautions, such as ensuring that:

- **Live, neutral and earth connections are connected to the right terminals on extension leads** (if not, the equipment may work but may also be lethal).

- Damaged leads are taken out of service **at once** and preferably replaced, not repaired.
- Extension leads are fully unwound from the drum (there is a risk of fire from serious overheating).
- Outer cases of equipment are correctly earthed.
- Multiple socket distribution boards are used instead of plug-in multiple adapters.
- Correct fuses are used in 13 amp plugs (**never** bypass or replace with wire, silver paper or a nail).
- Ventilation is not blocked around high-power amplifiers (this can cause overheating).

### **Maintenance**

55 Electrical equipment is often moved from place to place. However careful you are, equipment can easily be damaged. It is therefore vital that all electrically powered equipment, including extension boxes and cables whether moved or not, should be visually inspected frequently. As a general guide, you should inspect equipment, preferably before using it at a new location or alternatively when it is taken out of service for storage. If there is damage to any electrical part or if it causes an RCD to trip, it should be taken out of service at once and replaced, or repaired by a competent person such as an electrician.

56 Typical routine checks for portable apparatus are shown in the checklist in Appendix 2 of this leaflet.

57 Regular electrical tests may also be appropriate. These will detect the faults that cannot be seen at inspection, such as lack of continuous earth. Such tests must be undertaken by a person competent to do so, eg a competent electrician. These tests should be undertaken initially every five times the equipment is used. If you find that this frequency never identifies any damaged or faulty equipment, you could test it less often. Advice on in-service inspection and testing can be found in HSG107 *Maintaining portable electrical equipment*<sup>7</sup> and an IET code of practice.<sup>8</sup>

58 The law does not require you to keep records of inspection, test and repair, but they provide useful information on the general condition of equipment and will help in making sure that maintenance checks are carried out at the relevant intervals. It is a good idea to keep a simple record either on a card or a label stuck to the equipment to show when it was last inspected (date) and tested (date and test readings).

## Appendix 1: Legal requirements

1 The Health and Safety at Work etc Act 1974 (HSW Act) applies to the majority of activities and venues associated with the entertainment industry. Under section 2 of the HSW Act employers have a general duty to ensure, so far as reasonably practicable, the health and safety at work of their employees. This duty includes in particular the provision of safe plant and equipment, safe systems of work, a safe workplace and the information, instruction, training and supervision needed to ensure safety.

2 This section of the Act will have an application where an entertainer is employed (eg as part of a pop group or as a member of a touring theatre group) and to any staff who may be employed at the venue.

3 Section 3 of the HSW Act places a general duty on employers and the self-employed to ensure, so far as reasonably practicable, the health and safety of persons other than employees who may be affected by the way in which the undertaking is conducted. This means that a person controlling a venue, either as an employer or in a self-employed capacity, has a duty to conduct the undertaking in a manner which does not compromise the health or safety of, for example, visiting entertainers or members of the public in the audience.

4 Similarly, entertainers also have responsibilities for themselves and anyone else who may be affected by their activities.

5 Section 4 of the HSW Act places duties upon the person (eg the owner of a venue) who has control of premises made available as a place of work. These duties require them to ensure, so far as reasonably practicable, that the premises, all means of access and egress available for use by people using the premises as a place of work, and any equipment or substances in the premises, or provided for use there, are safe and without risks to health.

6 Employees have a duty to take reasonable care for the health and safety of themselves and others who may be affected by their acts or omissions at work. They also have a duty to co-operate with their employer on health and safety matters and must not interfere with or misuse anything provided by others in the interests of health and safety. These requirements are contained in sections 7 and 8 of the HSW Act.

7 The Management of Health and Safety at Work Regulations 1999 require employers or the self-employed to undertake a risk assessment of their work activity to identify what control measures need to be taken to comply with health and safety law. In addition, they require co-operation with and co-ordination of activities with other employers at the venue, so that reasonable steps are taken to ensure health and safety.

8 The Electricity at Work Regulations 1989 apply wherever the HSW Act applies. These Regulations set out, in general terms, the safety requirements for installations and the safety of people working with or near electrical systems. They also impose duties of compliance and, in most cases, this will include a duty on the occupier of the premises and, in many cases, a duty on those using the premises. Further information is given in the *Memorandum of guidance on the Electricity at Work Regulations 1989*.<sup>9</sup>

## Enforcement responsibilities

9 Responsibility for enforcement of the HSW Act falls either to the Health and Safety Executive (HSE) or the local authority (usually the Environmental Health Department or its equivalent).

10 If advice is required on safety matters relating to a performance and there is doubt about which enforcement authority has inspection responsibility for the premises, this can be sought from HSE or the appropriate department of the local authority.

## Appendix 2: Checklist

Listed below are typical routine electrical checks for portable apparatus. This checklist is only intended as a guide; certain apparatus may need different or additional inspections and tests. The checks should be carried out by a suitably competent person. Note: Non-electrical checks are outside the scope of this leaflet.

<b>Equipment:</b>		
Make	Model	Serial number
<b>User inspection:</b> With equipment disconnected		
<i>Item</i>	<i>What to look for</i>	<i>Pass condition</i>
1 Mains lead	Check for cuts, splits and crush damage	No inner (coloured brown, blue or green/ yellow) insulation visible; no bulges in cable
2 Mains plug	Check for broken casing, and cable properly clamped	No cracks in plug casing. No damage allowing contact with plug internal connections. Cable clamped securely by outer sheath, no inner insulation visible
3(a) Equipment connector (or)	Check for broken casing on equipment and cable connectors. Check cable clamp	No cracks in plug or socket casing. No damage allowing contact with plug or socket internal connections. Cable clamped securely by outer sheath, no inner insulation visible
3(b) Equipment cable entry	Check grommet or clamp still there. Check cable clamp	No sharp edges on contact with cable. Cable clamped securely. No inner insulation visible
4 Mains on/off switch, voltage selector switch, fuse holders etc	Check for broken insulation	No cracked insulation, no loose parts, no parts missing
5 Equipment housing	Check for general condition. Check for loose parts inside	No holes (large enough to put a finger in) close to mains cable or switches. No rattles when you tilt it a quarter of a turn

## References

- 1 *Electrical safety for entertainers* Leaflet INDG247(rev1) HSE Books 2013  
[www.hse.gov.uk/pubns/indg247.htm](http://www.hse.gov.uk/pubns/indg247.htm)
- 2 *Controlling risks in the workplace*  
[www.hse.gov.uk/toolbox/managing/managingtherisks.htm](http://www.hse.gov.uk/toolbox/managing/managingtherisks.htm)
- 3 BS 7909:2011 *Code of practice for temporary electrical systems for entertainment purposes* British Standards Institution
- 4 BS 7671:2008 (2011) *Requirements for electrical installations (IET Wiring Regulations, Seventeenth edition)* Institution of Engineering and Technology
- 5 *Guidance Note Number 3, 5th edition, to the 17th Edition of the Wiring Regulations* Institution of Engineering and Technology ISBN 978 0 86341 857 0
- 6 G59/2 *Recommendations for the connection of generating plant to the distribution systems of Licensed Distribution Network Operators* The Energy Networks Association 2010
- 7 *Maintaining portable electrical equipment* HSG107 (Third edition) HSE Books 2013 ISBN 978 0 7176 7201 6 [www.hse.gov.uk/pubns/books/hsg107.htm](http://www.hse.gov.uk/pubns/books/hsg107.htm)
- 8 *IET Code of practice for in-service inspection and testing of electrical equipment* Institution of Engineering and Technology ISBN 978 0 85296 844 4
- 9 *Memorandum of guidance on the Electricity at Work Regulations 1989. Guidance on Regulations* HSR25 (Second edition) HSE Books 2007 ISBN 978 0 7176 6228 9

## Further information

For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit [www.hse.gov.uk/](http://www.hse.gov.uk/). You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

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