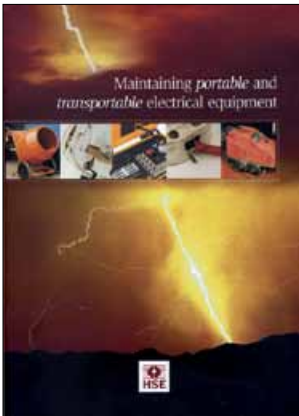


# Maintaining *portable* and *transportable* electrical equipment



**This is a free-to-download, web-friendly version of HSG107 (Second edition, published 2004). This version has been adapted for online use from HSE's current printed version.**

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**ISBN 978 0 7176 2805 6**

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Nearly a quarter of all reportable electrical accidents involve portable or transportable equipment. If you use this type of equipment in your workplace, this book can help you to maintain it in a safe condition and prevent accidents. This new edition contains updated advice, with new sections on cables and repair/replacement.

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First published 1994  
Second edition 2004

ISBN 978 0 7176 2805 6

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# Contents

|                               |    |
|-------------------------------|----|
| Introduction                  | 4  |
| Duties under the law          | 5  |
| Explanation of terms used     | 6  |
| Controlling the risk          | 6  |
| Use of the equipment          | 8  |
| Construction of the equipment | 8  |
| Cables                        | 8  |
| Environment                   | 9  |
| Maintenance                   | 9  |
| Repair and replacement        | 14 |
| Appendix 1 Legal requirements | 15 |
| Appendix 2 Summary            | 16 |
| References                    | 17 |
| Further information           | 18 |

# Introduction

1 Nearly a quarter of all reportable electrical accidents involve portable equipment. The vast majority of these accidents result in electric shock. This book gives advice on how to maintain portable and transportable electrical equipment safely and avoid such accidents. This new edition contains updated advice, with new sections on cables and repair/replacement.

2 The guidance covers equipment that may be connected to the fixed mains supply, or to a locally generated supply, and could result in an electric shock or burn, or fire due to damage, wear or misuse. It covers electric drills, extension leads, portable handlamps, portable grinders, pressure water cleaners, floor cleaners, electric kettles and similar equipment used in all environments. It also gives advice on what the legal requirements for maintenance can mean in practice.

3 This book should assist employers, employees and the self-employed who use, or have control over, portable or transportable electrical equipment. It describes what action can be taken to maintain the equipment in a safe condition, wherever it is used, and help prevent danger arising. The recommended maintenance strategy is based on a straightforward, inexpensive system of visual inspection that can be undertaken by an employee. The strategy is explained in more detail in paragraphs 37-53. People in control are, however, free to take other action or use alternative control measures that achieve an equivalent standard of safety.

4 In addition to the general principles set out here, more detailed guidance has been produced for offices and other low-risk environments, for the hotel sector, and for construction sites.<sup>1, 2, 3</sup>

5 Portable and transportable electrical equipment should only be used for its intended purpose, and in the environment it was designed and constructed for. Maintenance will not allow safe use of equipment in circumstances it is not intended for, eg using a table lamp as a hand lamp, or equipment that is not waterproof in a wet environment.

Examples of portable and transportable equipment



6 Major items of plant, such as vehicles, cranes and generators, are beyond the scope of this book, as are electromedical equipment and electrostatic spraying equipment, and equipment used below ground in mines, for which there are special requirements.

7 Specialised business equipment, such as computers, printers, photocopiers etc, does not present the same degree of risk as equipment such as electric drills, providing the leads and plugs are protected from mechanical damage or stress. Movement, and therefore damage through being moved, is less likely to occur, and the equipment is often double-insulated and used in a dry, clean environment with non-conducting floors.

8 Detailed information on inspection and testing of electrical equipment has been produced by the Institution of Electrical Engineers (IEE).<sup>4</sup> This document gives guidance both for those with management responsibility for electrical maintenance, but who may have little technical knowledge, and for those who actually carry out the inspections and tests. The IEE document gives advice and makes recommendations on what may be considered to be 'pass' or 'fail' conditions. In the past there has been an unnecessarily high failure rate for certain types of equipment, often due to insufficient information or knowledge.

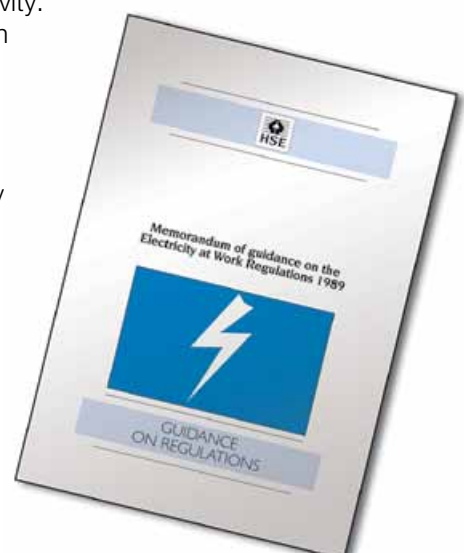
## Duties under the law

9 There are legal duties on manufacturers and suppliers covering the initial integrity (safety) of new work equipment. There are general duties covering the use and maintenance of work equipment, designed to ensure that it remains in a safe condition. Further details are contained in Appendix 1.

10 The particular legal requirements relating to the use and maintenance of electrical equipment are contained in the Electricity at Work Regulations 1989 (EAW). These Regulations apply to all work activities involving electrical equipment. They place duties on employers, the self-employed and employees (subsequently referred to as duty holders). These duties are intended to control risks arising from the use of electricity.

11 The Regulations are goal-setting, describing safety objectives to be achieved, without prescribing the measures to be taken. This allows the duty holder to select precautions appropriate to the risk rather than having precautions imposed that may not be relevant to a particular work activity. For further information see the Memorandum of Guidance on the Electricity at Work Regulations 1989 (EAW Memorandum).<sup>5</sup>

12 EAW Regulation 4(2) requires that all systems be maintained, so far as reasonably practicable, to prevent danger. This requirement covers all items of electrical equipment including fixed, portable and transportable equipment. Particular actions that can be taken in order to maintain portable and transportable equipment, and thereby prevent danger, are described in paragraph 34 of this book onwards. The Memorandum also gives guidance on the meaning of 'reasonably practicable'.



# Explanation of terms used

## Hazard

13 A simple definition of a hazard is anything that can cause harm if things go wrong (eg a fault on equipment).

## Risk

14 A simple definition of risk is the chance (large or small) of harm actually being done when things go wrong (eg risk of electric shock from faulty equipment).

## Portable and transportable

15 There is no universally accepted definition of what is meant by portable or transportable electrical equipment. However, in this guidance it means equipment that is not part of a fixed installation, but is intended to be connected to a fixed installation, or a generator, by means of a flexible cable and either a plug and socket, or a spur box, or similar means. This includes equipment that is either hand-held or hand-operated while connected to the supply, intended to be moved while connected to the supply, or likely to be moved while connected to the supply. The electrical supply to the equipment is assumed to be at a voltage that can give a fatal electrical shock to a person, ie more than 50 V ac or 120 V dc.

16 Examples of portable equipment include: tools and extension leads in the construction industry (high-risk); grinders and handlamps in general manufacturing (medium-risk); and floor cleaners and metal-bodied kettles in offices (medium-risk). Extension leads, plugs and sockets, and cord sets that supply portable equipment, are classified as portable equipment because they operate in the same environment and are subject to the same use as the equipment they serve.

*Note: The word 'portable' is used subsequently to mean both portable and transportable.*

# Controlling the risk



A pressure washer

17 Failure to maintain the equipment is a major cause of accidents involving portable equipment. The likelihood of accidents occurring and their severity will vary, depending on the type of electrical equipment, the way in which it is used and the environment in which it is used.

18 An example of a high-risk activity is the use of a pressure water cleaner, powered by a 230 V electrical supply, with the cable trailing on the ground where it can be damaged by vehicles and other equipment, and where water is present. Damage to the cable or other parts is likely to expose the operator or others to electric shock.

19 Similar risks result when electrical equipment such as drills or portable grinders are used in a harsh and sometimes wet environment such as at a construction site, where there is a high probability of mechanical damage.

20 Lower risks result from floor cleaners or kettles that are generally used in a more benign environment, eg offices and hotels. But such equipment can still be subject to intensive use and wear. This can eventually lead to faults that can also result in a shock, burns or, more rarely, a fire.

21 Control of risks arising from the use of portable electrical equipment should be based on a risk assessment. Guidance on carrying out a risk assessment is given in paragraphs 56-59. Risks can be managed and controlled by setting up an appropriate maintenance system including the measures referred to in paragraphs 36-53.

22 An electrical accident can lead to a potentially fatal electric shock, or fire affecting the whole premises. The maintenance system should therefore be designed to be proactive, ie planned to prevent incidents arising, rather than reactive, where action is taken following an incident/accident. The measures taken should be appropriate to the risk. Procedures will need to be carried out more frequently where the risk is high, eg on construction sites, and less frequently where the risk is lower, eg in offices.

23 Much 'unauthorised' equipment is brought to work by employees (eg electric heaters, kettles, coffee percolators, electric fans). Use of such equipment should be controlled and it may need to be included in the maintenance regime (particularly the formal visual inspection described in paragraphs 41-46) if its use is permitted. Equipment that fails a user check (paragraphs 39-40) or a formal visual inspection should not be used until it is properly repaired.

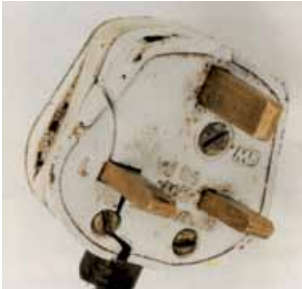
24 If you are setting up a maintenance regime for the first time, see Table 1 (after paragraph 59) for suggested initial intervals between both formal visual inspections and combined inspections and tests. Duty holders may use the suggested intervals as a starting point, but every situation has to be considered in relation to the type of equipment, its use and its environment. Duty holders may therefore choose intervals that they consider to be appropriate. (The suggested frequencies for inspection and testing given in Table 1 are recommendations and are not legal requirements.)

25 With practical maintenance experience, it may be possible to extend maintenance intervals if few faults are found. However, if faults are common it may be necessary to reduce intervals, or take other action to improve maintenance and reduce risk.

Cable damage



## Use of the equipment

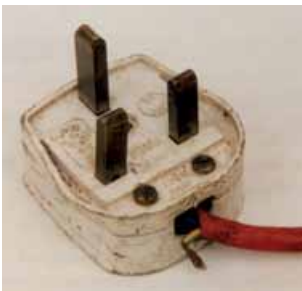


Damaged plug casing

26 Portable equipment and the electrical connections to it (eg the plug and flexible cable and its terminations) are likely to be subjected to, and more vulnerable to, physical damage and wear or harsh treatment in use than equipment which forms part of the fixed installation. The fixed installation is usually provided with a significant degree of protection against damage by the fabric of the building or fixed enclosure. (But the same legal requirements apply to both portable and fixed equipment.)


27 Equipment that is held by hand or handled when switched on will present a greater degree of risk because, if it does develop a dangerous fault, the person holding it will almost certainly receive an electric shock.

## Construction of the equipment



Lost earth connection

28 For safety reasons some electrical equipment relies on the metallic (exposed conducting) parts of the equipment being effectively earthed. This type of equipment is known as 'Class I'. If this earth connection is lost there is a possibility of the exterior of the equipment becoming live, with a potentially fatal result. Anyone touching live metal will be in contact with electricity.

29 Another category of electrical equipment, known as 'Class II' (which includes double-insulated equipment marked ) , is constructed with high-integrity insulation and does not have or need an earth connection in order to maintain safety.

## Cables



Damaged cable

30 The most vulnerable item is often the cable (sometimes called cord or lead) that supplies the equipment. Most portable equipment is supplied by a flexible cable, which is made up of thin, flexible wires covered in insulation and then enclosed in an overall sheath. The cable may deteriorate due to ageing or environmental effects, fail because of repeated flexing, or suffer mechanical damage. The most obvious examples of mechanical damage are being struck or penetrated by objects.

31 Repeated or excessive flexing will eventually cause the conductor to fracture and the sheath to crack. Damage usually occurs first at the cord grip or gland where the cable enters the equipment or its plug. The damage is usually apparent at the user check (see paragraphs 39-40) and should be reported. The cable should be replaced before a dangerous fault develops, such as exposure of conductors, or possibly arcing between broken conductor ends.



Damaged cable grip

32 Some portable equipment (such as floor-polishers, hedge-trimmers, saws and soldering irons) is capable of causing damage to the sheath, or even to the insulation, of its own flexible cable. The cable should be secured in such a way that it does not come into contact with parts that are moving or hot. The users of such equipment should always be on the alert to avoid such damage. If damage does occur they should stop using the equipment and report it.

## Environment

33 The risk of receiving an electric shock will be greater when the user of portable electrical equipment is standing on a surface that is a good electrical conductor (such as the ground outside, a concrete floor or on scaffolding) than if they are standing on a wooden floor or dry carpet and not in contact with earthed metal work.

## Maintenance



Cracked casing and damaged cable sheath

34 Although a good initial level of safety can be achieved by correct selection and use of equipment and its connectors and cables, lasting safety can only be attained by ongoing and effective maintenance (see paragraphs 36-37). Users should treat their equipment reasonably, including stopping it if defects occur and reporting them.

35 In many cases (eg Class I equipment), the safety of portable electrical equipment depends on the continued integrity of the earthing, and correct connections, of the fixed electrical installation up to and including the socket supplying the equipment. So you should also correctly select, use and maintain the fixed installation, although this is outside the scope of this book - see *Inspection and testing* (Guidance Note 3) from the Institution of Electrical Engineers (IEE)<sup>6</sup> for guidance on inspection and testing of the fixed electrical installation.

36 Maintenance can include visual inspection, testing, repair and replacement. Maintenance will determine whether equipment is fully serviceable or remedial action is necessary. Routine inspection and appropriate testing, where necessary, are normally part of any overall strategy for ensuring that work equipment is maintained in a safe condition.

37 Cost-effective maintenance of portable electric equipment can be achieved by a combination of:

- checks by the user;
- formal visual inspections by a person trained and appointed to carry them out;
- combined inspection and tests by an electrically competent person or by a contractor.

38 Management should follow up these procedures by monitoring the effectiveness of the system and taking action where faults are found, particularly when faults are frequent.

### User checks (visual)

39 The person using the equipment should be encouraged to look at it critically and check for signs that it may not be in sound condition, for example:

- damage (apart from light scuffing) to the cable sheath;
- damage to the plug, for example the casing is cracking or the pins are bent;
- inadequate joints, including taped joints in the cable;
- the outer sheath of the cable is not effectively secured where it enters the plug or the equipment. Obvious evidence would be if the coloured insulation of the internal cable cores were showing;
- the equipment has been subjected to conditions for which it is not suitable, eg it is wet or excessively contaminated;



Cable damage covered with tape

- damage to the external casing of the equipment or there are some loose parts or screws;
- evidence of overheating (burn marks or discoloration).

40 These checks also apply to extension leads and associated plugs and sockets. The user should make visual checks when the equipment is taken into use and during use. Any faults should be reported to management and the equipment taken out of use immediately. Management should take effective steps to ensure that the equipment is not used again until it is repaired by a person competent to carry out the task (eg the defective equipment could be labelled as 'faulty' and its associated plug removed).

### Formal visual inspections

41 The most important component of a maintenance regime is usually the formal visual inspection, carried out routinely by a trained person. Such inspections can pick up most potentially dangerous faults and the maintenance regime should always include this component.

42 To control the risks and to monitor the user checks, a competent person should carry out regular inspections that include visual checks similar to those in paragraphs 39-40 but undertaken in a more formal and systematic manner. Additional checks could include:

- removing the plug cover and ensuring that a fuse is being used (eg it is a fuse not a piece of wire or a nail etc);
- checking that the cord grip is effective;
- checking that the cable terminations are secure and correct, including an earth where appropriate, and there is no sign of internal damage, overheating or ingress of liquid or foreign matter.

43 The formal visual inspection should not include taking the equipment apart. This should be confined, where necessary, to the combined inspection and testing.

44 The trained person can normally be a member of staff who has sufficient information and knowledge of what to look for, and what is acceptable, and who has been given the task of carrying out the inspection. To avoid danger, trained people should know when the limit of their knowledge and experience has been reached. Simple, written guidance relating to the visual inspection can be produced that summarises what to look for and which procedures to follow when faults are found or when unauthorised equipment is found in use. This guidance can also help equipment users.

45 The formal visual inspections should be carried out at regular intervals. The period between inspections can vary considerably, depending on the type of equipment, the conditions of use and the environment. For example, equipment used on a construction site or in a heavy steel fabrication workshop will need much more frequent inspection than equipment such as floor cleaners in an office. In all cases, however, the period between inspections should be reviewed in the light of experience. Faulty equipment should be taken out of service and not used again until properly repaired. If necessary, it should be tested.

46 The pattern of faults can help management decide what action to take, depending on whether the faults show:

- the wrong equipment is being selected for the job;
- further protection may be necessary in a harsh environment;
- the equipment is being misused.



Homemade fuse



Missing screw on earth connection

## Combined inspection and tests

47 The checks and inspections outlined in the previous paragraphs will, if carried out properly, reveal most (but not all) potentially dangerous faults. However, some deterioration of the cable, its terminals and the equipment itself can be expected after significant use. Additionally, the equipment itself may be misused or abused to the extent that it can give rise to danger. Some of these faults, such as loss of earth integrity (eg broken earth wire within a flexible cable), or deterioration of insulation integrity, or contamination of internal and external surfaces, cannot be detected by visual inspection alone. Periodic combined inspection and testing is the only reliable way of detecting such faults, and should be carried out to back up the checks and inspection regime. Testing is likely to be justified:

- whenever there is reason to suppose the equipment may be defective (but this cannot be confirmed by visual inspection);
- after any repair, modification or similar work;
- at periods appropriate to the equipment, the manner and frequency of use and the environment.

48 The inspection carried out in conjunction with testing should usually include checking:

- the correct polarity of supply cables;
- correct fusing;
- effective termination of cables and cores;
- that the equipment is suitable for its environment.

49 Such combined inspection and testing requires a greater degree of competence than that required for inspection alone, because the results of the tests may require interpretation and appropriate electrical knowledge will be needed. However, it can often be carried out by a competent employee.

50 People carrying out testing of portable electrical equipment should be appropriately trained for this work. It is the employer's duty to ensure that they are competent for the work they are to carry out. Basically, there are two levels of competency.

- The first level is where a person not skilled in electrical work routinely uses a simple 'pass/fail' type of portable appliance tester (PAT), where no interpretation of readings is necessary. The person would need to know how to use the PAT correctly. Providing the appropriate test procedures are rigorously followed and acceptance criteria are clearly defined, this routine can be straightforward.
- The second level is where a person with appropriate electrical skills uses a more sophisticated instrument that gives actual readings requiring interpretation. Such a person would need to be competent through technical knowledge or experience related to the type of work.



Portable appliance tester (PAT)

51 Some combination of the actions in paragraphs 39-46 should provide the most cost-effective way of ensuring, so far as is reasonably practicable, that equipment will be maintained in a safe condition wherever it is used. The actions in paragraphs 39-43 are relatively simple. The more extensive inspection and testing described in paragraphs 48-50 can be carried out less frequently if the maintenance system includes formal visual inspections and monitoring of the user checks described in paragraphs 39-43.

52 Testing can be carried out at minimal cost where an employee has been trained to a suitable level of competence and provided with appropriate equipment.

## **Maintenance and test records**

53 Although there is no requirement in the EAW Regulations to keep maintenance logs for portable and transportable electrical equipment, the EAW Memorandum<sup>5</sup> does refer to the benefits of recording maintenance, including test results. A suitable log is useful as a management tool for monitoring and reviewing the effectiveness of the maintenance scheme and also to demonstrate that a scheme exists. It can also be used as an inventory of equipment and a check on the use of unauthorised equipment (eg domestic kettles or electric heaters brought to work by employees).

54 The log can include faults found during inspection, which may be a useful indicator of places of use, or types of equipment, that are subject to a higher than average level of wear or damage. This will help monitor whether suitable equipment has been selected. Entries in a test log can also highlight any adverse trends in test readings that may affect the safety of the equipment, thus enabling remedial action to be taken. Be careful when interpreting trends where a subsequent test may be done with a different instrument to that used for an earlier test, as differences in the results may be due to difference in the instruments rather than deterioration in the equipment being tested.

55 Records do not necessarily have to be on a paper system. Test instruments are available that store the data electronically, which can then be downloaded directly onto a computer database. Duty holders with large amounts of equipment will find it useful to label equipment to indicate that the equipment has been tested satisfactorily, ie has been passed as safe, and when the date for the next test is due. Otherwise, individual items may be missed on consecutive occasions.

## **Frequency of inspection and combined inspection and testing**

56 Deciding on the frequency of inspection and testing is a matter of judgement by the duty holder, and should be based on an assessment of risk. This can be undertaken as part of the assessment of risks under the Management of Health and Safety at Work Regulations 1999.<sup>7</sup>

57 Paragraph 59 and Table 1 can help any duty holder decide how often to carry out a formal visual inspection as well as combined inspection and testing, particularly where a maintenance regime has not previously existed. Alternatively, seek advice from a competent person who has the knowledge and experience to make the necessary judgement, eg manufacturers or suppliers of equipment, or relevant trade associations.

58 Factors to consider when making the assessment include the following:

- type of equipment and whether it is hand-held or not;
- manufacturer's recommendations;
- initial integrity and soundness of equipment;
- age of the equipment;
- working environment in which the equipment is used (eg wet or dusty) or likelihood of mechanical damage;
- frequency of use and the duty cycle
- of the equipment;
- foreseeable abuse of the equipment;
- effects of any modifications or repairs to the equipment;
- analysis of previous records of maintenance, including both formal inspection and combined inspection and testing.

59 Table 1 sets out the suggested frequency of formal visual inspections and combined inspections and electrical tests for portable and transportable electrical equipment. It gives suggested starting intervals when implementing a maintenance programme. Where one figure is given, this is a guide for anticipated average use conditions; more demanding conditions of use will require more frequent formal visual inspections, and/or combined inspections and tests. Where a range is shown, the small interval is for more demanding conditions of use and the longer interval is for less demanding ones. It is up to the duty holder, with appropriate advice where necessary, to assess the conditions affecting equipment, which may lead to potential damage and/or deterioration and should determine the maintenance regime.

**Table 1** Suggested initial maintenance intervals

| Type of business  | User checks                                       | Formal visual inspection                | Combined inspection and test   |
|---|---|---|--|
| Equipment hire  | N/A   | Before issue/after return               | Before issue   |
| Construction (For indication only. See <i>Electrical safety on construction sites</i> <sup>3</sup> for more detail) | 110 V – Weekly<br>230 V mains – Daily/every shift | 110 V – Monthly<br>230 V mains – Weekly | 110 V – Before first use on site then 3-monthly<br>230 V mains – Before first use on site then monthly |
| Light industrial  | Yes   | Before initial use then 6-monthly       | 6 – 12 months  |
| Heavy industrial/high risk of equipment damage  | Daily   | Weekly                                  | 6 – 12 months  |
| Office information technology, eg desktop computers, photocopiers, fax machines                                     | No  | 1 – 2 years                             | None if double-insulated, otherwise up to 5 years  |
| Double-insulated equipment <b>not</b> hand-held, eg fans, table lamps   | No  | 2 – 3 years                             | No   |
| Hand-held, double-insulated (Class II) equipment, eg some floor cleaners, kitchen equipment and irons               | Yes   | 6 months – 1 year                       | No   |
| Earthed (Class I) equipment, eg electric kettles, some floor cleaners   | Yes   | 6 months – 1 year                       | 1 – 2 years  |
| Equipment used by the public, eg in hotels  | By member of staff                                | 3 months                                | 1 year   |
| Cables and plugs, extension leads   | Yes   | 1 year                                  | 2 years  |

60 In premises where portable electrical equipment is used by the public, and where a duty holder does not have direct control over the way it is used, formal visual inspection may need to be done much more frequently. This should be determined by knowledge of the likely risks, and subsequently modified in the light of experience.

61 In many premises, eg in the health service, or in education, hotels and offices, more than one inspection and test regime may apply to different types of equipment. Some transportable electrical equipment may be less susceptible to mechanical damage, eg a table lamp in an office, which is supplied from a plug and socket and is rarely handled or moved. In a relatively benign environment, these conditions can be described as similar to those for fixed installations and the need

for examination and test set accordingly, for example in their guidance<sup>6</sup> the IEE recommend every five years for business and commercial premises.

62 However, these conditions do not apply to all office equipment. Some frequently used items (floor cleaners, kettles, free-standing electric heaters etc), which may be likely to suffer abuse and damage, would need to be inspected and tested more frequently, until results can be studied and failure rates analysed.

63 After the first few formal visual inspections, the information obtained can be used to give an indication as to the intervals before further inspections are carried out. The same is true for combined inspection/testing. A low failure rate would indicate that the interval can be increased and a high failure rate that the interval should be shortened; see paragraphs 53-55 on record keeping.

## **Repair and replacement**

64 The repair of most portable electrical equipment requires specialist knowledge and expertise if the faulty or damaged equipment is to be restored to the necessary safe condition. It is often more cost-effective to replace cheaper items than to repair them. Similarly, it is better to replace than to repair faulty or damaged plugs, connectors and flexible cables.

65 Where flexible cables have been in use for a long time, it is better to replace rather than repair them because conductor wires, insulation and sheathing materials deteriorate. Replacement of relatively short lengths of unsatisfactory cable is usually cheaper than carrying out repairs.

66 Where longer lengths of cable are involved, if the damaged part is close to one end, cut it off. If the damage is not near one end, after removing the damaged section, you can join the healthy sections by using a proprietary cable coupler. If a coupler is used, the socket part should be on the section fed from the electricity supply side and the plug part should be on the cable connected to the equipment.

# Appendix 1

## Legal requirements

1 The initial integrity (safety) of new work equipment when first supplied is covered by:

- section 6 of the Health and Safety at Work etc Act 1974,<sup>8</sup> which requires *‘any person who designs, manufactures, imports or supplies any article for use at work or any article of fairground equipment:*
  - (i) to ensure, so far as is reasonably practicable, that the article is so designed and constructed that it will be safe and without risks to health at all times when it is being set, used cleaned or maintained by a person at work;*
  - (ii) to take such steps as are necessary to secure that persons supplied by that person with the article are provided with adequate information about the use for which the article is designed or has been tested and about any conditions necessary to ensure that it will be safe and without risks to health at all such times as are mentioned in paragraph (i) above and when it is being dismantled or disposed of ...’;*
- the Electrical Equipment (Safety) Regulations 1994,<sup>9</sup> which require certain safety objectives to be met, including design and construction to assure protection against hazards arising from the electrical equipment, and protection against hazards that may be caused by external influences on the electrical equipment;
- the Supply of Machinery (Safety) (Amendment) Regulations 1994,<sup>10</sup> which contain a general requirement for protection against electrical hazards.

2 The general duties covering the use and maintenance of work equipment in addition to the Electricity at Work Regulations 1989<sup>5</sup> are contained in:

- section 2 of the Health and Safety at Work etc Act 1974, which requires *‘the provision and maintenance of plant ... so far as is reasonably practicable safe...’;*
- the Management of Health and Safety at Work Regulations 1999,<sup>7</sup> which require an employer to make *‘a suitable and sufficient assessment of the risks to health and safety of employees ... for the purposes of identifying the measures he needs to take to comply with the requirements ... imposed upon him ... under other relevant law’*. Such a risk assessment should include risks arising from the use of electrical equipment;
- the Provision and Use of Work Equipment Regulations 1998,<sup>11</sup> which require the employer (person in control) to select suitable work equipment (regulation 5) and to *‘ensure that work equipment is maintained in an efficient state, in efficient working order and in good repair’*.

# Appendix 2

## Summary

You can use this summary to check whether you are managing the risks from portable electrical equipment effectively.

- Set up a system of maintenance for portable (and transportable) electrical equipment.
- Identify which portable electrical equipment needs to be maintained and find out where it is used and how. Decide what to do about 'unauthorised equipment' brought in by employees.
- Provide straightforward training and information for all users (including yourself) to help carry out user checks.
- Set up a formal visual inspection system and train someone to carry this out.
- Consider producing brief, written guidance on the formal visual inspection, what to look for and procedures to follow when faults are found and when unauthorised equipment is in use.
- Decide on the appropriate frequency for formal visual inspection. If records of formal visual inspections are kept, the findings can be reviewed and the records used to help you decide how frequently these inspections should be carried out.
- Assign someone to test equipment that:
  - is suspected of being defective (but this cannot be determined by visual examination), has been repaired or modified;
  - is due for a combined inspection and test (or has never had one at the start of a maintenance regime).
- Ensure that the person carrying out combined inspection and testing has sufficient knowledge, training and experience as well as access to further information and advice where necessary.
- Decide on an appropriate frequency for combined inspection and testing where this is necessary.
- Review records of test results and use these to decide on how frequently you should carry out combined inspections and tests.
- Monitor all the arrangements and ensure that follow-up action is carried out, including a review of the frequency of formal visual inspection.

## References

- 1 *Maintaining portable electrical equipment in hotels and tourist accommodation* Leaflet INDG237 HSE Books 1996 (single copy free or priced packs of 10 ISBN 0 7176 1273 2)
- 2 *Maintaining portable electrical equipment in offices and other low-risk environments* Leaflet INDG236 HSE Books 1996 (single copy free or priced packs of 10 ISBN 0 7176 1272 4)
- 3 *Electrical safety on construction sites* HSG141 HSE Books 1995 ISBN 0 7176 1000 4
- 4 *Code of practice for the in-service inspection and testing of electrical equipment* Institution of Electrical Engineers (IEE) 2001 ISBN 0 85 296776 4
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- 9 *Electrical Equipment (Safety) Regulations 1994* SI 1994/3260 The Stationery Office 1994 ISBN 0 11 043917 1
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