Introduction

1.1 Almost a quarter of all reportable electrical accidents involve portable equipment with the vast majority of these accidents resulting in electric shock. This guidance gives advice on how to maintain portable and transportable electrical equipment safely and avoid such accidents.

1.2 The guidance covers equipment that may be connected to the fixed mains supply, or to a locally generated supply, and may result in an electric shock, burns or fire as a result of damage, wear or misuse. It also gives advice on what the legal requirements for maintenance can mean in practice.

1.3 Additionally, The Electricity at Work Regulations 1989 (EAW) contains the particular legal requirements relating to the use and maintenance of electrical equipment. These regulations apply to all work activities that involve the use of electrical equipment. They place specific duties on employers, the self-employed and on employees and it is intended that these duties control the risks arising from the use of electricity.

1.4 The Regulations are goal setting rather than prescriptive, describing safety objectives that need to be achieved, whilst not prescribing the measures to be taken. This approach allows the duty holder (employer, employee, self-employed etc.), to select the precautions appropriate to the risk rather than having precautions imposed upon them that may not be relevant to the work activity.

2. What is Portable or Transportable Electrical Equipment?

2.1 There is no universally accepted definition of what is meant by portable or transportable electrical equipment. However, for the purposes of 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 a plug and socket.

(The word ‘portable’ is used subsequently to mean both portable and transportable)
2.2 Portable equipment includes items that are either hand-held or hand-operated while connected to the supply, is intended to be moved whilst connected to the supply, or likely to be moved while connected to the supply.

2.3 The electrical supply to the equipment is assumed to be at a voltage that can give a fatal electrical shock to a person, i.e. more than 50V ac or 120V dc.

2.4 Examples of portable electrical equipment include:

- Kettles;
- Desktop computers;
- Photocopiers;
- Fax machines;
- Fans;
- Table lamps;
- Extension leads;
- Floor cleaners, etc.

It is also important to remember that,

- Extension leads;
- Plugs and sockets;
- Cord sets which 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.

3. How to achieve safe use of Portable Electrical Equipment

3.1 The procedure requires that all portable electrical equipment used within the University, except that owned by students and used exclusively in halls of residence, be inspected and tested by a nominated competent person (see Section 4 for definition of competent person), to a pre-determined programme (see Annex A for guidance).

3.2 Schools and Service Departments undertaking to carry out such testing must nominate one or more Competent Person(s) to carry out the following:

- Co-ordinate the registration of new and existing items;
- Conduct the inspection and/or testing of new and existing portable electrical equipment; and,
- Be responsible for the recording and monitoring of the whole operation.

All items should then carry a registration number and a test label with an expiry date of the period for which it is certified for service. No equipment should be used after the stated expiry date. This can also identify equipment in use in the School or Service Department that should be recorded on inventory records.
3.3 If any item of equipment is considered to be defective in any way, it should be reported to the appropriate Competent Person within the School or Service Department who should remove the test label, withdraw the equipment from service and, if appropriate, arrange for it to be inspected, repaired and re-tested.

3.4 If there is no Competent Person available within the School or Service Department then it may be possible to arrange for an external contractor to carry out the testing and recording. However, it is essential that only external contractors approved by the University of Wolverhampton be engaged to carry out this work. Arranging for an external agency MUST be organised through the Property Services Division of the Facilities Department.

3.5 Deans and Service Directors are responsible for ensuring that the testing and inspection of portable electrical equipment is carried out. It is therefore advisable to set up a review mechanism by which they can ensure that their School or Service Department is compliant with this procedure.

3.6 Portable and transportable electrical equipment should only be used for its intended purpose, and in the environment it was designed and constructed for. Not even an effective maintenance regime will allow for safe use of equipment in situations it is not intended for, e.g. using a table lamp as a hand lamp, or equipment that is not waterproof in a wet environment.

4. Who is the Competent Person?

4.1 Individuals carrying out the testing and/or the repair of electrical equipment, or carrying out experimental work on electrical equipment or associated connections must have appropriate technical knowledge, training and information to enable them to work safely. Persons who are not thus qualified may work with electrical equipment provided suitable and sufficient supervision by a competent person is provided.

4.2 A person can demonstrate competence to perform portable electrical testing work, by:

- Having successfully attended and completed a course of instruction organised by the Department of Risk, Safety and Health for Portable Electrical Safety; or by being,

- A qualified and experienced electrician who has completed the current edition of the IEE Regulations for Electrical Installation Course

The former being competent to carry out tests only. The latter will be competent to carry out both tests, and repairs of designated portable equipment.
4.3 It is also recognised that many members of staff will have acquired a basic competence in noting faults in plugs and cables, without training which can be readily identified. This basic competence will be sufficient, in general, for such individuals to carry out the visual inspection of a piece of electrical equipment before using it and should report any defect immediately to the relevant Competent Person.

5. Controlling the risks – deciding upon your maintenance system

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

5.2 When assessing the risks from equipment the issues that need to be considered include the following:

- The type of equipment being used;
- The environment in which the equipment is being used; and
- The frequency with which the equipment is used.

Controlling the risks arising from the use of portable electrical equipment must be based on risk assessment. Guidance on the frequency of portable appliance testing can be found later in this guidance.

5.3 In order to control risks effectively an appropriate maintenance system should be set up to review new and existing pieces of portable electrical equipment. It is advisable that all schools and service departments have a schedule for testing and re-testing of portable electrical equipment. It is the responsibility of all Deans and Service Directors to ensure that the testing and re-testing of equipment takes place.

5.4 It is possible that unauthorised equipment may be brought into the University by staff and students (e.g. electric heaters, kettles, electric fans etc.). The potential poor condition of this equipment may lead to potentially fatal electric shock, or fires, which may affect the whole of a building, therefore it is as important to manage and remove this equipment from the premises, as it is to test and re-test the authorised equipment.

5.5 If you are setting up a maintenance regime see Annex A for suggested initial intervals between both visual inspections and combined inspection and tests. Competent persons may use the intervals as a starting point, but every situation must be considered in relation to the type of equipment, its use and its environment. Schools and Service Departments may therefore choose intervals they consider to be more appropriate. (The suggested frequencies for inspection and testing given in Annex A are recommendations and are not legal requirements).
6. Checking and maintaining of the equipment

6.1 Although good initial levels of safety can be achieved by the correct selection and use of equipment, lasting safety can only be achieved by ongoing and effective maintenance. It is important that users treat their equipment reasonably; this includes stopping it if defects occur and reporting them to the competent person (Dean or Service Director if no internal Competent Person) within their School or Service Department.

6.2 Maintenance can include visual inspection, testing, repair and replacement. Maintenance will also 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 (see Annex B).

6.3 Cost-effective maintenance of portable electrical equipment can be achieved by a combination of:

- checks by the users – (including damage to the plug, damage to the cables, damage to the external casing of the equipment, evidence of overheating);
- formal visual inspection by a person trained and appointed to carry them out – (including removing the plug cover and checking the fuse, checking the cord grip, checking for signs of internal damage); and
- combined inspection and tests – (including the correct fusing, earthing integrity, insulation integrity).

7. Maintenance and test records:

7.1 Whilst there is no requirement under the Electricity at Work Regulations to keep maintenance logs for portable equipment, there are benefits to recording maintenance, including test results. The benefits of having a recorded system include:

- management tool for monitoring and reviewing the maintenance scheme;
- enables managers to demonstrate maintenance does take place; and,
- useful as an inventory of equipment and identifies the use of unauthorised equipment, however this does not replace the existing inventory scheme operated by the Finance Department.

7.2 Records do not necessarily have to be on a paper system. There are test instruments available that can store the data electronically; these can then be downloaded directly onto a computer database. Labelling of equipment to indicate that it has been tested satisfactorily, and when the date for the next test is due should also prevent individual items being continually missed.
8. Frequency of Inspection and combined inspection and testing:

8.1 Deciding upon the frequency of inspection and testing is a matter of judgement by Schools and Service Departments, and should be based on an assessment of risk. In order to assist in making this decision, Schools and Service Departments are advised to refer to Annex A in this guidance.

8.2 When assessing the frequency of inspection and testing it is important to take into account the following:

- type of equipment and whether it is handheld or not;
- manufacturer’s recommendations;
- initial integrity and soundness of the equipment;
- the age of the equipment;
- working environment in which the equipment is used (e.g. wet or dusty, indoors or outdoors);
- the frequency of use of the equipment;
- any foreseeable abuse of the equipment;
- the effects of any modifications or repairs to the equipment; and
- analysis of previous records of maintenance, including both formal inspection and combined inspection and testing.

9. New Equipment:

9.1 There is generally no requirement to carry out tests or visual inspections on new items of electrical equipment prior to the equipment being put into first use, however it is essential that a user check is always carried out to identify any obvious visible evidence of damage. If there are any signs of damage, the equipment must not under any circumstances be used, it must be referred back to the supplier/manufacturer, and/or thoroughly tested for electrical safety.

Approved by Safety Policy Committee
23rd June 2006
The Department of Risk Safety & Health brings together four related areas, namely the Risk Service, Safety Service, Occupational Health Service and the Internal Audit Service. Our function is to provide advice, information and guidance on all matters concerning risk, safety and health management at work for the managers and staff of the University.

About the Risk Service
The Risk Service is principally concerned with the development of risk management across the University through the achievements of the targets set in the annual HEFCE Accounts Directions. It is the aim of the Risk Service to embed risk management across the University through the development of school, service department and project based registers of risk and through training programmes. The Risk Service also has responsibility for developing the University’s first comprehensive Business Continuity Plan.

About the Safety Service
The Safety Service is concerned with the provision of advice, guidance and information to members of staff on a range of safety related issues which include; injury and accident prevention, improvements in safe working methods, the suitability of new equipment and work practices from a safety perspective, to provide information resulting from changes in relevant legislation, to be involved in risk assessments and to continually attempt to promote a culture of safety awareness.

About the Occupational Health Service
The Occupational Health Service is concerned with enabling the University to work towards a healthy and efficient workforce. Through health promotion, risk assessment and close liaison with all levels of staff and management, its aim is to encourage understanding of the effects of work on health and quality of life. By facilitating a range of services Occupational Health Service aims to ensure that the University complies with all legislative requirements in relation to employee health and welfare, but also to affect attitudes of both employer and employee to be more pro-active in their approach to health, safety and welfare.

About the Internal Audit Service
The Internal Audit Service are an independent function that provides an objective assurance service. Their aim is to help the University accomplish its objectives by evaluating the effectiveness of its risk management, control, and governance processes. The Internal Audit Service is provided by an external contractor.
## Frequency of inspection and combined inspection and testing

### Suggested initial maintenance intervals

<table>
<thead>
<tr>
<th>Type of equipment</th>
<th>User checks</th>
<th>Formal visual inspection</th>
<th>Combined inspection and test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery Operated: (less than 20 volts)</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Extra low voltage: (less than 50 volts AC) e.g. telephone equipment, low voltage desk lights</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Equipment hire</td>
<td>No</td>
<td>Before issue/after return</td>
<td>Before issue</td>
</tr>
<tr>
<td>Light industrial equipment</td>
<td>Yes</td>
<td>Before initial use, then 6 monthly</td>
<td>6 months to 1 year</td>
</tr>
<tr>
<td>Heavy industrial/high risk of equipment damage</td>
<td>Daily</td>
<td>Weekly</td>
<td>6 months to 1 year</td>
</tr>
<tr>
<td>Office information technology e.g. desktop computers, photocopiers, fax machines</td>
<td>No</td>
<td>1 to 2 years</td>
<td>None if double-insulated - Otherwise up to 5 years</td>
</tr>
<tr>
<td>Double insulated equipment not hand-held, e.g. fans, table lamps</td>
<td>No</td>
<td>2 to 3 years</td>
<td>No</td>
</tr>
<tr>
<td>Hand-held double insulated (Class II) equipment, e.g. some floor cleaners, kitchen equipment and irons</td>
<td>Yes</td>
<td>6 months to 1 year</td>
<td>No</td>
</tr>
<tr>
<td>Earthed (Class I) equipment, e.g. electric kettles, some floor cleaners</td>
<td>Yes</td>
<td>6 months to 1 year</td>
<td>1 to 2 years</td>
</tr>
<tr>
<td>Cables and plugs, extension leads</td>
<td>Yes</td>
<td>1 year</td>
<td>2 years</td>
</tr>
</tbody>
</table>

Frequencies based on the Health and Safety Executive’s documents:

- HSG 107 ‘Maintaining Portable and Transportable Electrical Equipment’
- INDG236 ‘Maintaining portable electrical equipment in offices and other low-risk environments’
### Maintenance of equipment

<table>
<thead>
<tr>
<th>Type of testing</th>
<th>Conducted by</th>
<th>To include</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Checks</td>
<td>Person using the equipment</td>
<td>Damage to cable sheath; Damage to the plug; Inadequate joints, including taped joints in the cable; Equipment subjected to unsuitable conditions e.g. it is wet; Damage to the external parts of the casing of the equipment; Evidence of overheating (burn marks or discoloration)</td>
</tr>
<tr>
<td>Formal Visual Inspection</td>
<td>Competent Person within School or Service Department</td>
<td>Removing the plug and checking the fuse; Checking the cord grip is effective; Cable terminations are secure and correct;</td>
</tr>
<tr>
<td>Combined Inspection and Tests</td>
<td>Competent Person within School or Service Department</td>
<td>The correct polarity of supply cables; Correct fusing; Effective termination of cables and cores; That the equipment is suitable for its environment; Any loss of earth or insulation integrity.</td>
</tr>
</tbody>
</table>

NB: These are not exhaustive lists of items to check and merely represent a guide to what should be included. Competent Person(s) should also refer to any appropriate training they have received.