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INTRODUCTION

There are a number of issues, which arise throughout all areas of schools, such as the use of portable electrical appliances, computers and VDUs, and the records and procedures to be used in relation to these are included in this section.

PORTABLE ELECTRICAL APPLIANCES

The Electricity at Work Regulations require that all systems shall be maintained so as to prevent danger so far as is reasonably practicable. Regular inspection, whilst not specified in the Regulations, is clearly an essential part of any preventative maintenance programme.

Portable Electrical Appliance Register

The form on the next page is to allow a register of all portable electrical appliances in a school to be kept. It is important to keep a register of such equipment as it tends to be moved around the school as it is required and may easily be missed during an inspection of portable electrical appliances.

Key Points

Portable electrical appliances are appliances that are intended to be moved while in operation or which can be moved from one place to another while connected to the supply eg. toaster, food mixer, vacuum cleaner.

Hand held appliances are portable equipment intended to be held in the hand during normal use eg. drill, soldering iron, kettle.

Every item, whether new, second-hand or on loan, should be labelled in a unique identifiable fashion. The ability to identify an item regardless of its location is important. Most schools have several items of the same model and type.

New stock should be bought from reputable suppliers in order to ensure that it meets any regulations and is suitable for the required use. A note must be made when equipment is lost, sold or replaced. Details of new equipment must be recorded as soon as the equipment arrives in the school. Any items, which are acquired by means other than purchase, e.g. equipment that is donated or loaned, should be tested fully before use.

Comments on the source of or any restrictions on the use of, appliances should be noted in the "Comments" column.

INSPECTION

The Health and Safety Executive has indicated that cost effective maintenance of portable electrical equipment can be achieved by a combination of actions at three levels:

- Checks by the owner/user of the equipment.
- Formal visual inspections by a person appointed to do this.
- Combined inspection and testing by a competent person or contractor.

Inspection, depending on what is appropriate at the time for the individual piece of equipment, does not necessarily have to be carried out by a highly trained person. Many of the common faults which occur may be detected visually or by simply removing a plug top. Different levels of competence are required for different tasks. It is the schools responsibility to ensure that the level of competence is appropriate; it may be necessary to seek the guidance of a qualified electrician to assist in determining this.

User Checks

User checks are the responsibility of schools. These are informal checks by teachers or members of staff who should periodically be reminded that they should report any defects observed. Cables and leads of moveable equipment, e.g. kettles, are most at risk from damage in use. If a fault is suspected then the item should be unplugged before examination.

Each time an item of electrical equipment is used, a quick visual check should be made to verify that:

- The item is in good working order.
- There is no damage, eg: cuts, to the cable sheath.
- There is no damage to the plug, eg: bent pins or cracked casing.
- The socket is not overloaded - although the demand for power sockets in classrooms is often greater than the number of sockets available; the temptation to plug multi-socket into multi-socket must be resisted.
- The coloured insulation on the internal wires is not protruding from the plug or equipment.
- The equipment is not wet or excessively dusty.
- There is no obvious damage to the outer casing of the equipment, eg: loose screws.
- There is no evidence of overheating, eg: scorch marks.
- Extension leads are not a tripping hazard - if extension leads cannot be arranged so that they are well clear of circulation areas, they should be taped down or one of the proprietary cable holders should be used.

If it is considered that there is a fault then the piece of equipment must be unplugged and conspicuously labelled to prevent it being used until it has been examined and any necessary repairs carried out by a competent person and then, if necessary, tested.

Formal Visual Inspections

Formal visual inspections are for schools to arrange. Most people can carry them out after brief training. These are formal checks for obvious defects at predetermined intervals by a nominated person. It involves, for example, removing the covers of plugs, checks on fuses, security of cord grips and cable's termination and looking for signs of overheating damage.

If a fuse requires renewing, this should not be done unless it is certain that the reason for the fault has been determined and any fault cleared. Replacing a fuse with one of the correct rating is important. Although the equipment may be labelled with the correct size of fuse to be used, in other cases the replacing a fuse requires a certain level of competence. It should not be assumed that the size of fuse present is necessarily correct.

A Formal visual inspection does not usually require a qualified electrician. There may be exceptions depending upon the equipment type and use, who is available and what is found.

Combined Inspection and Testing of Portable Equipment

It is not always possible to identify electrical faults by visual inspection alone and it is sometimes necessary to carry out Portable Appliance Testing (PAT). Further information regarding testing is given below.

Record of Inspection

The objective of the following form is to assist in the inspection and testing of all portable electrical appliances, which are used in the school, as required by the Electricity at Work Regulations and Provision and Use of Work Equipment Regulations 1998. The form also allows results of any inspection to be recorded.

The result of the inspection should be entered as satisfactory or unsatisfactory. The reason for any failure should be recorded in the "Defect" column. Immediate action in relation to failed items might be to prohibit use and remove as appropriate. Follow-up action might include repair and subsequent re-testing, disposal or restocking. Details of any follow-up action which is required should be entered on the record in the space provided.

TESTING

Fixed Installations

When a system is first wired up, the electricity supply authorities require a 'Certificate of Compliance' before it can be connected to the mains supply. This is a certificate issued by an independent qualified electrician stating that certain tests have been carried out and that the system is in a fit state to be connected. A copy of this certificate should be kept and available on site.

After this initial certification the fixed wiring should need comparatively little attention. Re-testing of wiring and electrical installations is carried every 5 years, again, copies of the test certificates should be kept.

Portable Appliances

When an appliance is purchased, or first brought onto the premises, it should have already undergone tests for being suitable for the purpose it was made. That these tests have been carried out will be indicated by their being marked in some way. The BSI 'kite' approval mark is a well known example. So long as the equipment is to be used for the job it was designed it is necessary to do very little initially. A user check will normally suffice.

Local managers/governing bodies will need to appoint a competent person to be responsible for the maintenance of a Register/Inventory of portable electrical appliances (those with a plug on the end including leads). This responsibility will include ensuring all new equipment is:

- individually marked;
- entered into the Register/Inventory;
- assessed as to test interval; and
- regularly tested thereafter.

A testing regime should be established based on an assessment of the risks, considering the environment, the equipment and how it is used. For higher risk environments such as science, technology, caretaking and kitchens, this should be carried out annually. Less frequent inspections would be acceptable in lower risk environments, eg: offices and kitchens (fridges, cookers which are wired into a fixed point). Some items will only require inspection (most electronic equipment), but some will also require testing. The tests are an 'insulation test' and an 'earth-bond test'. Simple proprietary 'pass/fail' testers are available from major scientific suppliers. A competent person, eg a technician or non-teaching assistant with appropriate training, should carry out the tests.

All appliances, which pass this annual test, must be labelled clearly with the date on which the test was passed. Those which fail should be taken out of use and labelled.

They should be sent to a competent technician for repair (unless it is a simple matter like the wrong fuse) or disposed of safely.

The first step in any inspection is to compile an inventory of all the equipment, which needs to be tested. This can be done with the aid of the *Portable Electrical Appliance Register*, which can be found earlier in this section. The name and unique code for each item in a room should be recorded at the time of inspection.

A record must be kept of the date on which each inspection takes place and its outcome. A sticker placed on each item giving details of the test date and its outcome does not necessarily ensure that every item is checked. It is better to have an accurate, up-to-date central record which allows a rolling programme of inspections to be drawn up and ensures that all items are checked, not just those items which can be located by the inspector on the day of the audit.

Soldering Irons

Soldering irons should be fitted with silicone heatproof cable.

Frequency of inspection and testing

The table on the following page is a suggested initial frequency of inspection and testing of electrical equipment in schools. No rigid guidelines can be laid down and intervals between checks must be kept under review. The formal visual inspection and combined inspection and testing must be recorded. User checks do not need recording unless a fault is found. Please note if class of equipment is not known, it must be tested as Class I.

Further Information

Guidance on electrical safety at work is available from the HSE see:
<http://www.hse.gov.uk/electricity/index.htm>

SUGGESTED INITIAL FREQUENCY OF INSPECTION AND TESTING

Type of equipment	User checks	Class I Equipment		Class II Equipment	
		Formal Visual Inspection	Combined Inspection and Testing	Formal Visual Inspection	Combined Inspection and Testing
Stationary equipment (exceeding 18 kg and is not provided with carrying handle, eg: refrigerator, washing machine)	Weekly by teacher/member of staff	None	12 months	12 months	48 months
Information technology equipment (eg: computers, VDUs, typewriters, franking machines, printers etc)	Weekly by teacher/member of staff	None	12 months	12 months	48 months
Movable equipment (18 kg or less and not fixed, eg: fans, heaters or equipment with wheels, handles etc)	Weekly by teacher/member of staff	4 month	12 months	4 months	48 months
Portable equipment (can be moved whilst in operation eg: food mixer, vacuum cleaner etc)	Weekly by teacher/member of staff	4 month	12 months	4 months	48 months
Hand-held equipment – (can be held in hand during normal use eg: drill, kettle, soldering iron etc)	Before use by teacher/member of staff	4 month	12 months	4 months	48 months

Class I equipment – Equipment in which protection against electric shock does not rely on basic insulation only, but which includes means for any exposed metal surfaces ‘bonded’ to the supply earth. These appliances will have an earth lead fitted.

Class II Equipment - Equipment in which protection against electric shock does not rely on basic insulation only, but in which additional safety precautions such as double insulation. These appliances do not have an earth lead fitted.

DISPLAY SCREEN EQUIPMENT

Introduction

This advice note is intended to provide guidance to Schools who use Display Screen Equipment. It meets the requirements of the Health and Safety (Display Screen Equipment) Regulations. The Regulations require employers to plan the activities of display screen equipment “users” in order to ensure that their daily work on display screen equipment is periodically interrupted by such breaks or changes of activity as are necessary.

Definition of display screen equipment

Display Screen Equipment means any alphanumeric or graphic display screen, together with a keyboard and/or a mouse, regardless of the technical process used. Examples are visual display units (VDUs) computer terminals, word processors, lap top and notebook computers.

Bracknell Forest Borough Councils Definition of a “User”

It will generally be appropriate to classify the employee as a Display Screen “user” if most or all of the following conditions are met:

- The individual depends on the use of display screen equipment to do the job, as alternative means are not readily available for achieving the same results.
- The individual has no discretion as to the use or non-use of the display screen equipment, and the line manager requires the work to be done by this method.
- The job must be filled by an individual trained/skilled in the use of display screen equipment.
- The individual normally uses display screen equipment for continuous spells of an hour or more at a time, or two hours intermittent use in a day.
- The individual uses display screen equipment in this way more or less daily.
- Fast transfer of information between the “user” and the screen is an important requirement of the job;
- The performance requirements of the system demand high levels of attention and concentration by the “user”, for example, where the consequences of error may be critical.

For the purposes of this document, “user” will mean someone who fits the above definition and who is therefore officially classed as a “user” in their current post. “Employee” will apply more broadly to all employees who may use a VDU to a lesser extent.

Display Screen Equipment (DSE) in schools

It is to the advantage of the School Governing Body to treat the Regulations as best practice in order to reduce the risks to teachers, pupils and all employees using DSE workstations.

The school should identify members of staff who are “users” through the use of a self-assessment questionnaire. Those identified will have an assessment made by a trained workstation assessor who will make any recommendations necessary for improvement, to comply with the regulations.

The School Governing body must also provide information and training for display screen equipment “users”. Detailed guidance on Display Screen Equipment is given in the Corporate Health, Safety and Welfare Manual.

Those members of staff who are “users” are entitled, on request, to a VDU eye-screening test. Further details should be available from your Personnel Department.

Procedure to identify a “user” and arrange eye testing

To identify a “user” we use a process which requires self-assessment by questionnaire. However a post already identified as a “user” on the basis of a previous questionnaire will not need to complete another one.

If an employee requests an eye test or complains of experiencing discomfort when using display screen equipment, the Head Teacher should check with Education personnel to see if that post is already identified as a “user” and when last tested.

If the employee is a new “user” or already designated as a “user” or needs a retest, then Education personnel will arrange an appointment for eyesight testing by the OHA.

Head Teachers should ensure that all display screen workers have completed Questionnaire 1 in Section 3(5) 10 of the Health, Safety and Welfare Manual. Check and ratify that this form has been fully completed, to confirm that it is a realistic response and that the job requires that level of VDU use.

If the employee does not meet the criteria as a “user”, they will be informed by letter (VDU2) from Education Personnel.

WORKSTATIONS

Overall, the risks associated with the relatively infrequent and unprolonged use of computers in education are thought to be low. Concerns have been expressed, however, about the possible effects of very low frequency radiation, eye disorders and posture-related stresses. As the use of computers and VDUs increases, it is sensible therefore to take simple precautions.

Key Points

Workstation design should take account of basic ergonomic principles. The extent to which these are taken into account depends on the length of time spent at the workstation.

The VDU image should be clear and stable. Adequate, but not excessive, illumination should be provided and harsh contrasts in background lighting should be avoided.

Posture is important for people working for any length of time at a workstation. Seating should be comfortable and adjustable. As a guide the lower arms should be horizontal and eyes at the same height as the top of the screen. Desks should be high enough to allow thigh clearance and low enough for the home row of keys to be at elbow height. Users of computers and VDUs should be trained so that they know the correct positions for equipment and hands and how to adjust equipment. In some cases, it might also be necessary to provide footrests and/or document holders.

Neck-ache and backache can be caused or aggravated by badly designed workplaces. Teachers should be careful to see that pupils are sitting comfortably and that they do not have to make awkward head movements to read from source documents or from the screen itself. It is not a requirement of the Health and Safety (Display Screen Equipment) Regulations to take

these measures in relation to pupils (only employees are covered). However, to do so could be considered part of a teacher's duty of care to pupils.

Visual problems may be tackled by re-positioning the screen or using blinds to avoid glare, by placing the screen at a more comfortable viewing distance from the user, or by ensuring that the screen is kept clean. In some cases more appropriate lighting may be needed. The operator should sit at a reasonable distance from the screen of the VDU - it is suggested that around 24 inches is a reasonable minimum.

There should be adequate workspace around each terminal, and cables and connections should be kept clear of possible interference. They should also be checked regularly and placed so that accidental contact is avoided.

No one should use VDUs for excessive periods. Changes in activity to give a break from the VDU should be built into the lesson. Short frequent breaks are better than longer less frequent ones.

Although there is no medical evidence that using a VDU has a long-term effect on eyes, there are a number of minor health problems and irritations, which have been linked to some degree with VDUs. Conditions, such as migraine headaches, itching skin or redness of the face and/or neck, have been identified. The cause appears to be a combination of a dry atmosphere in the room and static electricity near the VDU. These are not common complaints and they appear to be confined to those who are particularly sensitive but, nevertheless, teachers should be aware of these complaints. Again this is not a requirement of the Regulations, but it is part of teachers' duty of care to their pupils.

The Health and Safety Executive draws attention to a number of steps, most of which are no more than common sense, which can be taken to reduce the risk of an operator suffering any irritation or discomfort.

- The choice of VDU is obviously the most significant factor. Different screens have variable display contrasts; ie: the contrast between the bright characters and the darker background can be varied. In any case, operators should have some form of control over the contrast so that they can find their preferred level. Flickers on screens are becoming less common, but if flickering does occur because of a fault, it should be corrected immediately.
- Nobody should be allowed to work at a VDU screen for excessive periods. Rest pauses and changes of activity are necessary and should be built into lessons. Short frequent breaks are better than longer less frequent ones.
- There are a number of points about keyboard design which can both make the system operate more efficiently and also prevent fatigue and discomfort. Ideally, the keyboard should have a matt surround and the keys should have low reflectance surfaces with concave tops. The key legend should be legible under the room lights. The advantage of detachable keyboards is that they allow the operator to find an ideal working position.
- The Health and Safety Executive recommends that in order to provide as comfortable a working posture as possible, the underside of the work surface should be high enough to allow adequate thigh clearance. The top of the work surface should also be low enough for the "home row" of keys on the keyboard to be at elbow height for the seated operator. Chairs should be adjustable both in height and tilt, with adjustable backrests and good support for the back, pelvis and buttocks.
- There should be a comfortable room temperature and there should be no draughts in the room.

Further Information

Guidance on Display Screen Equipment is available from the HSE see:

<http://www.hse.gov.uk/msd/dse/index.htm>

OXYACETYLENE EQUIPMENT IN SCHOOLS

Introduction

Many accidents in schools are caused by cylinder mishandling and unsafe storage. The destructive potential arising from the uncontrolled release of gas from a high-pressure cylinder can be considerable.

Correct storage, handling, operation, maintenance and use of such equipment is therefore an important factor in workshop safety.

The equipment includes two gas cylinders one (painted black) containing oxygen and the other (painted maroon) containing acetylene. Gas is fed to a hand-held torch via rubber hoses and gas regulators. The unions of the connecting hoses should be left-hand and right-hand threaded respectively to prevent interchange of fittings. The acetylene hose should be fitted with a flashback arrester, and each hose should be fitted with a one-way valve at the end attached to the torch.

Cylinders in use and spare cylinders kept inside school workrooms should be secured to a wall or mounted on suitable trolleys. The number of cylinders inside school workrooms should be kept to a minimum. Gas cylinders should always be transported on a suitable trolley to avoid undue manual handling and the acetylene cylinders should never be allowed to rest or used horizontally.

Cylinder Handling

It is essential that proper training and instruction is given to all staff who are involved in cylinder handling. The following points are of note:

- purpose designed trolleys should be used for moving cylinders, wherever practicable;
- for hoisting, either a purpose-made cradle or a twin rope sling or bandage sling should be used;
- magnet hoists, single ropes or chain slings shall not be used;
- for moving over smooth floors or for short distances the familiar 'churning' method may be used. Gloves and foot protection shall be used;
- cylinders shall not be rolled along the ground since this may damage or even open the valve and will also damage identifying marks and symbols;
- a cylinder shall not be moved with the valve open;
- cylinders shall not be transported with the regulators and hoses attached unless on a purpose designed trolley or carrier;
- cylinders shall not be used as work supports or rollers.

Cylinder Storage

Additional spare gas cylinders should be kept in a safe secure place preferably in the open air, separated from school buildings, boundaries or fixed sources of ignition by at least 1 m. A lockable wire cage is recommended. Where open-air storage is not reasonably practicable cylinders should be kept in a well-ventilated storeroom. This should be located in a safe place away from school buildings and should be of fire-resisting construction. Acetylene cylinders should always be stored and used in an upright position. The following points are of note:

- always store and use cylinders in a vertical position;
- cylinders can be damaged by slag, sparks or falling metal particularly if laid down;
- precautions shall be taken to ensure that no electric current, eg: from arc welding processes, can reach the cylinders. Steel floors inserts; structural members or metal benches can carry earth return currents;

- cylinders shall not be exposed to heat;
- take care to prevent the heating of cylinders, either from the process, sparks and slag or any other external heat source;
- cylinder valves on empty cylinders shall be closed to prevent the ingress of moisture;
- store full and empty cylinders in a safe well-ventilated place preferably outside school buildings;
- never keep cylinders below ground level, next to drains, basements and other low-lying places – heavy gases will not disperse easily;
- some gas cylinders for example acetylene contains liquid – store them with their valves uppermost;
- protect cylinders from damage for example by chaining unstable cylinders in racks or trolleys;
- oxygen cylinders and their fittings should not be contaminated by oil or grease as these materials will ignite violently if exposed to oxygen under pressure.

Further information

A guidance leaflet for people who use compressed gases for welding, hot cutting and similar processes is available from the HSE see:

<http://www.hse.gov.uk/pUbns/indg297.pdf>