ELECTRICITY AT WORK POLICY

Introduction and Legislation

Contact with electricity can have fatal consequences. Each year about 1000 accidents at work involving electric shock or burns are reported to the HSE.

Even non-fatal shocks can cause severe or permanent injury. Shocks from faulty equipment may lead to falls from ladders, scaffolds or other work platforms.

Those using electricity may not be the only ones at risk. Poor electrical installations and faulty electrical appliances can lead to fires which may also cause death or injury to others. Most of these accidents can be avoided by careful planning and straightforward precautions.

Electrical safety in all work places and/or work activities is specifically legislated for over and above the general duty of care owed by employers to their employees and members of the public under the Health and Safety at Work, etc Act 1974.

This expansion of responsibility for electrical safety was brought about by the Electricity at Work Regulations 1989 (EAWR).

The aims of the Electricity at Work Regulations is very much on employers to assess the work activities which utilise electricity, or which may be affected by it, perhaps by virtue of being in the same vicinity, etc and to define all foreseeable risks associated with them. The criterion which should be considered is whether any work on or near electrical systems gives rise to danger and/or personal injury.

The provisions do not stop at merely preventing electric shock but also require the employer to have regard for all foreseeable risks. These should include the suitability, design, construction and installation of electrical systems for specific tasks, the possibility of adverse, including environmental, effects and necessary precautions due to the siting of such systems, and the provision of suitable and adequate protection/precautions.

Definitions

System – This includes all constituent parts of a circuit not just the functional circuit itself, which are connected to or affected by electrical energy.

Electrical Equipment – This includes everything from a 400 KV power line to a battery powered hand lamp. (Specific voltage limits have been deliberately omitted from the regulations, as the requirement is to prevent all risks from electricity, including the explosion of susceptible atmospheres which may occur at very low voltages).
**Conductor** – This is everything capable of carrying an electrical current and is not limited to conductors intended to carry current (a circuit conductor). In applying these provisions therefore employers must pay attention to metal casings, ionic (salt) solutions, etc in the vicinity which may for any reason, intentional or not, become electrically charged.

**Danger** - This is defined as any “risk of injury” and its prevention forms the basis of the regulations. However, in order to differentiate situations where “danger” cannot be prevented, ie work on live conductors, the regulations also include a definition for injury which is the “potential to harm persons”.

Death or harm to persons from any of the following may be considered under the term injury:

- Electric shock and burns;
- Fires of electrical origin;
- Electrical arcing;
- Explosions initiated or caused by electricity.

**Electrical Hazards**

The main hazards associated with electricity are:

- Any voltage above 50 Volts DC to ground is considered lethal;
- Contact with live parts causing shock and burns (normal main voltage 230 VOLTS AC, can kill);
- Faults which could cause fires and consequent human injury and fatality;
- Fire or explosion where electricity could be the source or ignition in a potentially flammable or explosive atmosphere.

Prior to any work with electricity it will be necessary to carry out a risk assessment.

**Electrical Installations**

All new electrical systems must be installed to a suitable standard by trained and competent personnel. BS7671 lays down the requirements for electrical installations. Thereafter all electrical systems must be monitored in a safe condition.

All existing electrical installations must also be properly maintained and must be tested by a competent person every 5 years.

In order to prevent overloading of electrical systems multi-socket adapters should not be used and they increase the risk of fire.
In-Service Inspection and Testing of Electrical Equipment

The Electricity at Work Regulations require that:

As may be necessary to prevent danger, all systems shall be maintained so as to prevent, so far as is reasonably practicable, such danger.

Regular inspection of equipment is an essential part of any preventative maintenance programme.

Records of maintenance, including test results, should be kept throughout the working life of the electrical equipment to enable:

- The condition of the equipment to be monitored;
- The effectiveness of the maintenance policies to be assessed, and;
- To demonstrate that an effective maintenance system is in place.

Other than the fixed installations, all electrical equipment in an installation, whether permanently connected or connected by a plug and socket outlet, should be inspected and tested in accordance with recommendations contained in the IEE Publication – Code of Practice for In-service Inspection and Testing of Electrical Equipment.

The frequency of in-service inspection and testing of electrical equipment at Lews Castle College can be found at ANNEX A to this Policy.

Responsibilities

The following people have responsibility for electrical systems and equipment.

- Users of electrical equipment (whose responsibilities include user checks);
- Administrators with responsibility for electrical maintenance who may not necessarily have detailed technical knowledge;
- The competent person carrying out the formal visual inspection and the inspections and tests;
- Other duty holders such as company directors, managers or building services managers.

The requirements of the Electricity at Work Regulations can be met by:

a) Performing in-service inspection and testing, which consists of 3 activities:

- User checks;
- Formal visual inspection (without tests);
- Combined inspections and tests.

b) Performing maintenance or, if necessary, replace the defective item of equipment (depending upon the results of the in-service inspection and testing) and,

c) Maintaining up to date records that can be a means of demonstrating compliance.
Equipment

The equipment covered by the Code of Practice for In-Service Inspection and Testing of Electrical Equipment includes Class 1, Class 2 and Class 3 equipment of the following types:

- Portable equipment;
- Movable equipment;
- Stationary equipment;
- Hand held equipment;
- Equipment that is plugged in;
- Equipment connected by means of a flexible cord or cable to a fused or infused connection unit or isolator;
- Built in appliances;
- IT equipment;
- Extension leads, RCD extension leads, multi-way adaptors, RCD adaptors;
- Equipment with high protective conductor currents.
Compliance

In order to comply with the Electricity at Work Regulations and the Provision and Use of Work Equipment Regulations it is important that all equipment purchased for use at Lews Castle College is suitable for its intended purpose. Responsibility for ensuring that all equipment procured is suitable for its intended purpose is delegated to the respective Head of Department as the competent person. Generally, all equipment procured for use at Lews Castle College should be commercially suitable equipment and not that intended for domestic use.

To ensure that all electrical equipment is inspected and tested it is important that the Head of Department makes arrangements for newly acquired equipment to be added to the LCC Equipment Register.

No item of electrical equipment can be put into service unless it has been added to the LCC Equipment Register and a formal visual inspection carried out. When it is more convenient to do so, the combined testing and inspection can be carried out.

The LCC Form “Equipment to be Added to Asset Register” should be completed by the Head of Department who has authorised the purchase of the item of equipment. Please refer to ANNEX A “Frequency of In-Service Inspection and Testing of Electrical Equipment at Lews Castle College” which lists the categories of equipment.

The form must then be forwarded to the Head Janitor.

When an item of electrical equipment becomes redundant or obsolete it must be removed from the Asset Register and arrangements made for its disposal. This can be done by completing the LCC Form “Disposal of Redundant or Obsolete Equipment”. The form must be forwarded to the Head Janitor who will arrange for disposal.

All forms are available on the LCC Intranet within the Health and Safety section under “Forms”.
Daily Before-Use Checks

With the exception of the daily before-use checks all other in-service inspection and testing of electrical equipment must only be carried out by trained and competent persons.

Where daily before-use checks are a requirement these checks must be carried out by the operator or in the case of workshop and classroom equipment the class lecturer.

After ensuring that the equipment has been disconnected the following visual checks must be carried out:

- Check for damage, cuts, abrasion (apart from light scuffling) to the cable covering;
- Check for damage to the plug, eg. the casing is cracked or the pins are bent;
- Ensure that there are no non-standard joints including tape joints in the cable;
- Ensure that the outer covering (sheath) of the cable is properly gripped where it enters the plug and the equipment and that none of the coloured insulation of the internal wires is visible;
- Ensure that the equipment is not being used in conditions where it is not suitable eg. a wet or dusty workplace;
- Ensure there is no damage to the outer covers of the equipment or obvious loose parts or screws;
- Ensure there is no evidence of overheating such as burn marks or staining.

All items of equipment that require daily before-use checks are listed in ANNEX A.

Electrical Equipment Hired or Borrowed by LCC

In the event of electrical equipment having to be hired or borrowed for use by LCC staff it is important that all such equipment complies with the standards laid down within this policy.

It will be the responsibility of the individual staff member hiring or borrowing the equipment to ensure that it is safe to use.

Unless there is documentary evidence available to indicate that the item of equipment has undergone periodic in-service inspection and testing, arrangements must be made to conduct the required testing prior to the item being put into service.

This work can be carried out by the Estates and Maintenance Section by prior arrangement.
Reducing the Risk

The most effective method of reducing the risk of injury when using electrical equipment is to limit the supply voltage to the lowest required to get the task done.

This can be achieved by various means and it will be the policy of Lews Castle College to:

- Use temporary lighting that can be run at lower voltage such as 12, 25, 50 or 100 volts;
- Where practically possible use battery operated tools;
- In construction environments use portable tools which are run from a 110 VOLT centre-tapped-to-earth supply.

Residual Current Safety Devices

Where it is not practically possible to use electrical equipment other then 240 VOLTS or higher an RCD (residual current device) must be used as a safety device.

The RCD device detects some, but not all, faults in the electrical equipment and will rapidly switch off the supply. If an RCD device is not already fitted within the main switchboard or socket outlet a plug-in RCD adapter must be used for the following items of electrical equipment:

- Cleaners equipment;
- Grounds maintenance and estates portable equipment;
- Some workshop and classroom equipment;

Use of Personal Electrical Equipment

Permission must be given by the Head of Department or Line Manager before any private and personal electrical equipment is connected to any College electrical supplies.

Where it is deemed necessary for any staff member, student or visitor to the College to use their personal item of electrical equipment, unless they have evidence available to indicate that the item has already been inspected and tested, arrangements must be made with the Head Janitor to have the item inspected and tested at LCC prior to connection to electrical supplies.
Safe and Suitable Equipment

All staff members must ensure that all items of electrical equipment are safe and suitable for the environment and task for which they are used.

General Guidance

- If electrical equipment is to be used in a harsh environment, consider eliminating the risk by using air, hydraulic or low-voltage battery hand tools;
- Ensure the equipment is maintained in a safe condition;
- Provide an easily accessible and clearly identified switch near each fixed machine to cut off power in an emergency;
- When using portable equipment, use socket outlets which are close by, so that equipment can be easily disconnected in an emergency;
- Ensure that the ends of cables always have the outer sheath firmly clamped to stop pulling out of the terminals;
- Replace damaged sections of cable completely;
- Use proper connections or cable couplers to join lengths of cable. Do not use block connections and insulating tape;
- Ensure that all electrical equipment used in flammable/explosive atmospheres are classed as “Intrinsically Safe”.

Safe Working

Only those who are authorised, are competent and have been trained, will be allowed to maintain, test and install equipment at Lews Castle College whether they be college employees or external contractors.

Where students are required to work with electrical systems or equipment a suitable and sufficient risk assessment will be produced and recorded by the competent lecturer in charge of the group or individual.

A high level of supervision will be required giving due consideration to students’ possible inexperience and in some cases immaturity.
Action to be Taken on Defective Electrical Systems or Equipment

When a fault has been identified on an electrical system or within an item of electrical equipment, that system or equipment must be isolated from the supply immediately and tagged accordingly.

Faults within electrical systems and equipment must be reported without delay using the Lewis Castle College Fault Report Form.

Faulty items of electrical equipment must be placed in secure storage to prevent unauthorised use.

Suitable lockout devices must be used to isolate equipment and systems from power sources.
## Frequency of In-Service Inspection and Testing of Electrical Equipment at Lews Castle College

<table>
<thead>
<tr>
<th>Type of Equipment</th>
<th>User Checks</th>
<th>CLASS 1</th>
<th></th>
<th>CLASS 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>110V Hand Tools, Construction Equipment - welders etc</td>
<td>Daily – Before Use</td>
<td>3 Months</td>
<td>6 Months</td>
<td>3 Months</td>
<td>6 Months</td>
</tr>
<tr>
<td>Cleaners/Estates and Maintenance Equipment</td>
<td>Daily – Before Use</td>
<td>6 Months</td>
<td>12 Months</td>
<td>6 Months</td>
<td>12 Months</td>
</tr>
<tr>
<td>Maintenance Appliances (used in external environments)</td>
<td>Daily – Before Use</td>
<td>1 Month</td>
<td>6 Months</td>
<td>1 Month</td>
<td>6 Months</td>
</tr>
<tr>
<td>Cleaners/Estates and Maintenance Equipment</td>
<td>Daily – Before Use</td>
<td>6 Months</td>
<td>12 Months</td>
<td>6 Months</td>
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</tr>
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<td>Daily – Before Use</td>
<td>1 Month</td>
<td>6 Months</td>
<td>1 Month</td>
<td>6 Months</td>
</tr>
<tr>
<td>Electrical Appliances (in kitchens) Hand Held &amp; Portable Equipment</td>
<td>Daily – Before Use</td>
<td>6 Months</td>
<td>12 Months</td>
<td>6 Months</td>
<td>12 Months</td>
</tr>
<tr>
<td>IT Equipment, Fax Machines Desktop Computers, Printers Photocopiers</td>
<td>Not Required</td>
<td>24 Months</td>
<td>48 Months</td>
<td>No</td>
<td>48 Months</td>
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<tr>
<td>Mains Extension Leads (Portable Use)</td>
<td>Daily – Before Use</td>
<td>6 Months</td>
<td>12 Months</td>
<td>6 Months</td>
<td>12 Months</td>
</tr>
<tr>
<td>Mains Extension Leads (Permanently Wired)</td>
<td>Not Required</td>
<td>12 Months</td>
<td>24 Months</td>
<td></td>
<td></td>
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<tr>
<td>Fans, Table Lamps, OHP Projectors, Portable Data Projects</td>
<td>Daily – Before use</td>
<td>12 Months</td>
<td>24 Months</td>
<td>12 Months</td>
<td>24 Months</td>
</tr>
<tr>
<td>Data Projector &amp; Screen (Permanently Wired)</td>
<td>Not Required</td>
<td>24 Months</td>
<td>48 Months</td>
<td>No</td>
<td>48 Months</td>
</tr>
<tr>
<td>Laboratory Equipment</td>
<td>Daily – Before use</td>
<td>12 Months</td>
<td>24 Months</td>
<td>12 Months</td>
<td>48 Months</td>
</tr>
<tr>
<td>Television’s VCR, DVD Players</td>
<td>Daily – Before use</td>
<td>24 Months</td>
<td>48 Months</td>
<td>24 Months</td>
<td>48 Months</td>
</tr>
<tr>
<td>Electric Kettles, Urns, Toasters, Microwave Ovens, Portable Heaters</td>
<td>Weekly</td>
<td>6 Months</td>
<td>12 Months</td>
<td>6 Months</td>
<td>12 Months</td>
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<tr>
<td>Washing Machines, Tumble Dryers, Refrigeration Equipment</td>
<td>Not Required</td>
<td>6 Months</td>
<td>12 Months</td>
<td></td>
<td></td>
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<tr>
<td>3 Phase 415V Fixed Equipment – Lathes, Drills, Woodworking Machinery - welders milling machines etc.</td>
<td>Daily – Before Use</td>
<td>6 Months</td>
<td>12 Months</td>
<td></td>
<td></td>
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<tr>
<td>Fixed Equipment 240V – Hand Dryer, Water Heaters</td>
<td>Not Required</td>
<td>12 Months</td>
<td>24 Months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hairdressing &amp; Cosmotology Equipment</td>
<td>Daily Before Use</td>
<td>6 Months</td>
<td>12 Months</td>
<td>6 Months</td>
<td>12 Months</td>
</tr>
</tbody>
</table>