Operating procedures relating to the use of electrical equipment and installations

13th November 2008

These operating procedures apply to all University staff with respect to electrical safety. Failure to comply with these procedures is likely to be a criminal offence under the Regulations and may also lead to disciplinary action by the University.

The attention of all staff is therefore drawn in particular to paragraph entitled "Safety of Personal Electrical Equipment owned by staff or students, other than in halls", which deals with personal electrical appliances brought onto campus by staff.

All documents and links referred to can be found at:
http://www.keele.ac.uk/admin/hr/ohsu/HandS_manual/keeleonly/electrical/

The purpose of these Operating Procedures is to ensure that the use, repair, modification and testing of all fixed electrical installations and electrical equipment (whether permanently wired in or portable) in the University is in accordance with the Electricity at Work Regulations 1989. In particular the Procedures are designed to ensure:

i. that all persons carrying out electrical installation work, repairs, modifications and testing have been adequately trained;

ii. that all electrical systems and equipment are tested at appropriate intervals and are maintained in a safe condition;

iii. that no person works on or near any live conductor, as detailed in "Work on live equipment" *Operating Procedures Relating to the Use of Electrical Equipment and Installations,* which represents a risk of harm unless it is absolutely necessary and then only in suitable locations and with precautions in place commensurate with the risk.

Control

CFM Estates have delegated authority and responsibility for ensuring the Electricity at Work Regulations 1989 are complied with. To assist CFM a University Estates Electrical Safety Adviser will be appointed.

The UESA shall be suitably qualified/experienced so that he/she is able to determine the level of training/experience needed for each job and is able to access the competence of individual CFM Estates personnel for particular jobs.

Where non compliance is brought to the attention of the UESA or Head of Estates this information will be forwarded to the relevant Dean, Research Institute Director, Administrative Director or Head of School, with a copy to the University Health & Safety Adviser, for the relevant actions to be taken.

Fixed Installations

i. Modifications to the 240V/415V electricity supply system or to fixed installations may only be carried out by persons who have been specifically approved by the Head of Estates, advised by the UESA.

ii. Work, including switching, on the University the 11 kV system, shall only be carried out by contractors authorised by the Head of Estates, advised by the UESA.

iii. The Head of Estates will delegate to the Estates Operations Team the arrangement of the testing of all fixed installations. This testing must be at appropriate intervals and be in accordance with the current edition of the BS 7671: IEE Wiring Regulations.

iv. Unless impracticable, all mains single and three phase outlets must be switched and shuttered.

v. Suitable electrical protection shall be provided in rooms in which live working has been authorised.

vi. All switch rooms and distribution boards should be kept locked and accessible to CFM Estates staff only. However, in appropriate circumstances (e.g. in areas with an ESA (see below)) access may be allowed by the Head of Estates, advised by the UESA.

vii. No inappropriate material shall be stored in switchrooms.

Equipment permanently wired in

This includes equipment which may be potentially movable, but cannot be connected or disconnected without access to the supply system.

i. All equipment permanently wired in must be identified to CFM Estates and an agreement reached with CFM Estates as to the responsibility for servicing and maintaining of the particular item.

ii. Equipment permanently wired in may only be connected or disconnected with the approval of the Head of Estates, as advised by the UESA. Notification of the intention to undertake such works should be requested via the Permit to Work system, details of which can be found on the DOHS website.

iii The electrical system supplying any equipment permanently wired in shall comply with BS 7671.

Portable electrical equipment

This includes any equipment operating on mains electricity supplied through cable and plug. This applies whether the equipment is owned by the University or not, for example where staff bring in electrical equipment, barring laptops.

Each Head of School/Department will be responsible for putting into place arrangements to ensure that:-

(a) a periodic visual inspection is carried out for all portable electrical equipment. This inspection should include a periodic electrical test. This should not be carried out on computers unless special electrical test apparatus is available. Portable electrical equipment such as cleaning equipment, kettles etc which are moved regularly will need visual inspection and electrical testing at more frequent intervals and the converse, for equipment rarely used. The period between these inspections and electrical tests is within the discretion of the person delegated with this responsibility by the relevant Head and should be based on School/Department risk assessments.

(b) all repairs of and modifications to portable electrical equipment are carried out in a safe manner;

The responsibilities in (a) will be met as follows:

Electrical visual inspection and testing may be carried out by an Electrical Safety Adviser (ESA), an Electrically Competent Person (ECP), a person approved by CFM Estates or UESA, normally an external electrical contractor, or by entering into a special arrangement with another cost centre's authorised personnel.

Before appointment, ECPs must have received the two-part training course arranged by the Department of Occupational Health and Safety and received their personal 'ECP Training Handbook'.

Heads of School/Departments are responsible for ensuring that any ESA or ECP they appoint has the necessary qualifications, training and experience, as advised by the UESA, before duties under (a) and (b) are undertaken. In addition, the following will also apply to portable electrical equipment.

i. School/Departments must maintain a list of persons permitted to carry out electrical repairs and testing.

ii. All portable electrical appliances must conform to the relevant current British Standards.

iii. All equipment used outdoors should be low voltage unless this is impracticable. Any other voltage equipment other than low voltage must be connected to a Residual Current Device set at 30 ma 30 ms. In addition, all portable equipment for which danger is reasonably foreseeable, for example power tools, mains powered soldering irons and equipment operating near water such as kettles must be connected to a residual current device.

iv. Where portable equipment is owned by one School/Department but housed elsewhere the owner is responsible for the testing. Where equipment is shared by several School/Departments the responsibility will be for the respective Heads of School/Department to decide who is responsible for the testing.

v. It is the responsibility of all staff bringing in portable electrical equipment to ensure that their apparatus is electrically safe and has a current PAT certificate. It is the responsibility of the relevant Head to ensure that this is the case.

The responsibilities in (b) will be met as follows:

In Schools/Departments in which substantial repairs and modifications of electrical equipment are carried out on a routine basis one or more Electrical Safety Advisers (ESAs) must be appointed. These persons should be suitably qualified/experienced to the satisfaction of the University Electrical Safety Adviser (UESA).

The ESA will decide on the level of training/experience needed for all electrically related work in the School/Department and will assess the competence of individuals for particular tasks.

In other School/Departments or Halls the Head or person responsible may enter into an arrangement with other cost centres to carry out electrical repairs and modifications by persons qualified as above. For those simple electrical repairs such as fitting a new plug or fuse an ECP would be an appropriate person.

Work on live equipment

Regulation 14 'Work on or near live conductors' of the Electricity at Work Regulations 1989 prohibits any person being engaged in any work activity on or near any live conductor that danger may arise, unless

(a) It is unreasonable in all the circumstances for the equipment to be dead; and

(b) it is reasonable in all the circumstances for the person to be at work on or near the equipment while it is live; and

(c) suitable precautions (including where necessary the provision of suitable protective equipment) are taken to prevent injury.

(Live work means any work on electrical equipment with exposed conductors).

The following rules apply whether the equipment is permanently wired in or portable:

Written authority from the UESA to the relevant Head of School/Department must be obtained before any live work is carried out, using the 'Application for Work on or Near Live Electrical Conductors'.

The procedure must be followed scrupulously by all School/Departments wishing to carry out live work on any electrical equipment working at voltages greater than 50 V, 50 Hz A.C. or 120 V D.C. or at lower voltages where there is a risk of burns due to a large current. The application should describe the work in general terms, explain why it is unreasonable in all the circumstances for the equipment to be dead, why the person needs to be at work on or near the equipment and what suitable precautions including where necessary the provision of suitable protective equipment will be taken to prevent injury. This must also include the maximum voltage, the personal protection regime, issues relating to a possible lone worker situation, measures to ensure that the area is safe when unoccupied, measures to prevent the distraction of persons by others entering the room and measures to examine all associated instrumentation. The name, qualifications, skills, experience and training of the person must also be included.

All work on live equipment will normally be carried out in well defined and suitable areas which are clearly labelled. Unapproved persons should be prevented from entering such areas. When live work is carried out those parts of the electrical system which are not essential to the work must be disconnected from the supply system.

Suitable protective and emergency procedures must be in place and readily available where such work is carried out.

Live work on equipment at more than 500 V must be carried out only in exceptional circumstances. A detailed case must be prepared before such

work is carried out and each procedure must be approved by the Head of Estates (advised as in i. above). This approval will not be granted unless the risk of injury is considered to be negligible.

Authorisation

Any such requests should be made at least 14 days prior to the desired date for the work to be undertaken. The Application Form will be completed by the relevant ESA and scrutinised by the UESA. They will then sign the document to confirm that, in their opinion, all the conditions of Regulation 14 of the Electricity at Work Regulations 1989 apply and the operating procedures will be complied with if all the safeguards proposed are satisfactorily implemented. When they are satisfied the form will be passed for signature to the Head of Estates or his appointee. When the document is returned signed and dated, the Head of School/Department or his elected representative will then authorise live working to commence by signing the Application Form stipulating the conditions and the date when live working may commence and cease. A copy of all completed authorisations should be sent to the DOHS.

Training

The University will provide training through the Department of Occupational Health and Safety and the Centre for Staff Development and Training in electrical safety as appropriate. In particular, new staff and postgraduate students must demonstrate competence before being allowed to carry out any electrical work.

Safety of electrical equipment owned by students living in halls

Restrictions on the use of electrical equipment owned by students living in Halls of Residence are outlined in the current booklet, 'Resident Information' issued by CFM. Emphasis is made on the importance that students bringing personal electrical equipment into Halls must ensure that it is maintained, is safe, and does not cause electrical danger. The University provides a service to students on the payment of a charge, for PAT inspection and testing.

General

It is the responsibility of all students and staff to report any possible electrical faults that they observe. In Halls such reports should be made to the Housekeeper. In School/Departments the report should be made to the ESA (or deputy), ECP or WSA.

Safety of personal electrical equipment owned by staff or students, other than in halls

The following rules relate to the Safe Use of Personal Electrical Appliances

i. Electrical appliances other than light bulbs must not be connected to light fittings.

ii. All electrical appliances must be connected to square pin plug tops which are fused to an appropriate rating. No more than one flex may be used per plug top. The flex must be securely clamped into the plug top.

iii. Where several appliances are to be run from one wall socket, flat distribution boards should be used in preference to cube-shaped adaptors. Cables should not exceed 2 metres in length.

iv. Work on live electrical equipment must not be carried out.

v. Cables must not be joined unless supervised by an electrically competent person.

vi. All personal portable electrical equipment must be visually examined and electrically tested as a normal part of the inventory of the School/Department. Equipment must be brought to the attention of the ECP or ESA immediately if it is brought onto campus. In addition personal electrical equipment must be inspected regularly and action taken in the event of finding:

   a. frayed, cracked or heat damaged cables,

   b. cables not adequately secured in plugs,

   c. damaged plugs

   d. damaged equipment casing.

   Note: Lap top computer leads, mobile phone chargers and similar apparatus occasionally brought onto campus do not need to be included on the inventory but staff are responsible for ensuring that such equipment is electrically safe.

vii. Unless specially authorised, staff or students must not carry out repairs themselves. They should seek assistance from an electrically competent person.

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AMENDED NOVEMBER 2001 (APPROVED BY OHSC)

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Published guidance available from the HSE (some held in the Department of Occupational Health and Safety)

- Memorandum of Guidance on the Electricity at Work Regulations 1989 - Guidance on Regulations RS(25)
- Electricity at Work Safe Working Practices, HS(G)85
- Safety Handbook for Undergraduate Electrical Teaching Laboratories
- Tutors' Guide in First Steps in Undergraduate Electrical Safety
- Maintaining Portable and Transportable Electrical Equipment, HS(G)107
- Electrical Safety in Arc Welding, HS(G)118
- Electrical Safety for Entertainers, IND(G)102L
- Electrical Storage Batteries Safe Charging and Use, IND(G)139L
- Electrical Safety on Construction Sites, IND(G)141 Maintaining Portable Electrical Equipment in Hotels, IND(G)164
- HSE Information Sheet 'Working Near Overhead Powerlines'
- HSE Information Sheet 'Maintenance of portable electrical equipment'
- EEA 'Recommendations for periodic safety checks for business equipment'
- IEE 16th Edition for Electrical Installations (Refer to Estates and Buildings Department)
- Programmable Electronic Systems in Safety Related Applications: An Introductory Guide
- Programmable Electronic Systems in Safety Related Applications: General Technical Guidance
- Further information is contained in the Safety Handbook issued to all staff and the booklet 'Electrically Competent Persons Training Handbook'.

Guidance Notes from HSE

- GN PM 29 Electrical Hazards from Steam/Water Cleaners
- GN PM 38 Selection and Use of Electric Handlamps
- GN PM 41 Application of photo-electric and safety systems to machinery
- GN GS 6 Avoidance of Danger from Overhead Electric Lines
- GN GS 23 Electrical Safety in Schools
- GN GS 38 Electrical Test Equipment for Use by Electricians
- GN GS 50 Electrical Safety at Places of Entertainment

HSE Guidance on Electrical Safety at Work can be found at http://www.hse.gov.uk/electricity/index.htm

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