South Staffordshire and Shropshire Healthcare NHS
NHS Foundation Trust

Facilities and Estates

Electrical Safety Low Voltage: Standard Operating Procedure

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Contents

Change Control – Amendment History

Version	Dates	Amendments

1 Introduction

The use of electricity makes it essential that all electrical systems are managed without giving rise to danger. Inadequate control and / or improper use of electricity are a danger to life and property. Owners, occupiers, general managers/chief executives and those responsible for electrical services as 'duty holders 'are accountable for ensuring control. They are also responsible for the safe management, design, installation, operation and maintenance of the electrical systems.

2 Purpose

South Staffordshire and Shropshire Healthcare NHS Trust, as duty holders will take all responsible steps to secure the safety of employees, third parties, service users and visitors who use, operate or maintain electrical equipment and /or systems on their premises. The Electricity at Work Regulations 1989 imposes duties on 'employers' to comply with these insofar as they relate to matters which are within their control. These duties are in addition to those imposed by the Health and Safety at Work Act 1974.

To satisfy these requirements the Trust will ensure that electrical systems and equipment are installed in accordance with the Institution of Electrical Engineers Wiring Regulations BS 7671, The Code of practice for the Inspection and Testing of Electrical equipment and the Department of Health Technical Memorandums HTM 06-2, 06-03.

Maintain the fixed electrical installation in a safe condition by carrying out routine inspection and testing.

Inspect and test portable and transportable equipment listed in the Trusts inventory of electrical equipment.

Promote and implement a safe system of work, maintenance and inspection and testing of all the electrical systems and associated general electrical equipment.

Forbid live working, unless absolutely necessary, in which case HTM 06-02 will be the governing document used to manage the work.

Exchange safety information with contractors and ensure that they are fully aware of and are prepared to abide by the Trusts health and safety arrangements.

Ensure that employees and contractors who carry out electrical work activities on electrical systems or equipment are competent to do so.

3 Scope

This SOP shall apply to all Trust staff, contractors, visitors and service users who may use or work on the electrical supplies or equipment which is owned by or is the responsibility of the Trust.

Where other organisations are in control of electrical systems in which the Trust places its staff, visitors or service users, Trust managers should ensure, where practicable, that appropriate precautions are being taken to minimize the risks from these systems.

This SOP is not intended to deal with specialist systems or equipment such as medical and electronic equipment, Advice on these systems and /or equipment should be sought from the organization with the responsibility to maintain them.

The Trust and its management have a duty, so far is reasonably practicable; to ensure that there is a management regime for the design, installation, and operational management of electrical systems and equipment.

4 Key Objectives of this SOP

4.1 Control of the Electrical Systems

The Trust's Estates Department shall implement a management regime to control and Operate the Safe Electrical Systems across the Trusts properties / Estate and any other properties they may be responsible for.

The Estates Department shall appoint and or nominate the following

4.2 Duty Holder -Chief Executive

This is a requirement under the Health and Safety at work act 1974 and unless this has been formally delegated and accepted by another person in writing the duty holder is taken to be the most senior manager of the Trust.

4.3 Designated Person

This is a requirement of the NHS guidance HTM 06-02 / HTM06-03.
The designated person is an individual appointed by the Trust (a board member or a person with responsibilities to the board) who has overall authority and responsibility for the electrical

systems within the premises who as a duty under the health and safety at work act 1974 to prepare and issue a general policy statement on health and safety at work, including the organisational arrangement for carrying out that policy.

4.4 Authorising Engineer (L.V /HV) Independent body of the Trust

This is a requirement of the NHS guidance HTM 06-02, HTM 06-03.
An Authorising Engineer (L.V / H.V) is appointed in writing by the Designated Person to take responsibility for the effective management of safety guidance (L.V / H.V)
The person appointed should possess the necessary degree of independence from local management to take action within this guidance (HTM 06-02 / 06-03).

4.5 Authorised Person (L.V)

This is a requirement of the NHS guidance HTM 06-02 / HTM 06-03.
An Authorised Person (L.V / H.V) is appointed in writing by the management on the recommendation of the Authorising Engineer in accordance with this safety guidance and is responsible for the implementation, management and operation of this guidance with regard to work, or the testing of defined electrical equipment / installation.

4.6 Competent Persons (L.V)

This is a requirement of NHS Guidance HTM 06-02.
A Competent Person (L.V) is approved and appointed in writing by the Authorised Person for defined work possessing the necessary technical knowledge, skill and experience relevant to the nature of the work to be undertaken, who is able to prevent danger or where appropriate injury and who is able to accept a permit to work from an Authorised Person, a register of both directly employed and contractor names will be held within the Estates department.
The responsibilities and duties of each of the above roles are defined in HTM 06-02.
Also see appendix 1 of this document.

4.7 Accompanying Safety Persons (L.V)

An Accompanying Safety Person is a person not involved in the work or test who has received training in emergency first-aid for electric shock and who has adequate knowledge, experience and the ability to avoid danger, keep watch, prevent interruption, apply first-aid and summon help. The person is to be familiar with the system or installation being worked on or tested, and is to have been instructed on the action to be taken to safely rescue a person in the event of an accident

4.8 Limitation of Access

This is a safety document, which is a form of declaration, signed and issued by an Authorised Person (LV) to a person in charge of work to be carried out in an area or location which is under the control of an Authorised Person (LV) and for which a permit-to-work (LV) is not appropriate.

4.9 Admittance to Switch rooms

All access doors to each switchroom must be kept securely locked when unattended.

Locks are to be identical so that a single key will enable access to be gained to any switchroom over which the Authorised Person (LV) has control or a degree of control on a site.

Each Authorised Person (LV) and Competent Person (LV) should be issued with a key; when a safety document is issued, the recipient of the document may also be issued with a key.

No person other than an Authorised Person (LV) or Competent Person (LV) may enter a switchroom unless they are accompanied by an Authorised Person (LV) or have receipt of a safety document issued by an Authorised Person (LV).

4.10 Security of Electrical Equipment

All electrical equipment should be secured against unauthorised operation. If the electrical equipment is not located within a switchroom, operation of such equipment should only be by the use of a tool or key.

4.11 Availability of Electrical Supplies

If the supplies of electricity are to be made unavailable or are to be put at risk via working on stand-by generators or uninterruptible power supplies, the Authorised Person (LV) or Competent Person (LV) responsible for the work should contact the person in charge of the area, and a signed “permission to disconnect” form should be obtained before the equipment is isolated

4.12 Training Requirements

Appropriate training shall be given to all the relevant staff for:-

Managing and Controlling the Electrical Systems
Authorised persons and Engineers
Competent Persons

Work on the Trust’s electrical infrastructure, systems and equipment may only be performed by personnel appointed as a Competent Person by the Trust’s Authorised Person (A/P) Team and trained in compliance with HTM 06-02.

The A/Ps need to be trained by an external approved training provider, accessed by the Authorising Engineer and to obtain certificates as per the requirements of the HTM 06-02 & 06-03.

Directly employed C/Ps need to attend a C/P course and be assessed by the A/P as per the requirements of HTM 06-02. This is to be reviewed every 3 years.

Contractor C/Ps, their training record and themselves are assessed by the A/P, this is reviewed at the A/Ps discretion, but with a maximum period of 3 years.

All Persons working on the electrical system MUST have a valid ‘First Aid’ cert. as per the HTM 06-02 & 03 requirements. These are renewable every three years.

4.13 Low Voltage Electrical works and Inspection and Testing

All work and inspection and testing of Electrical Systems and Equipment shall be undertaken in accordance with the following regulations and guidance

EAWR 1989
BS 7671 IEE Wiring Regulations (current edition)
The IEE code of practice for Inspection and Testing of Electrical Equipment
HTM 06-02

All electrical work undertaken on the fixed wiring shall be undertaken using a Permit to work system with the exception of the final standard circuit arrangements.

4.14 Drawings / Records

Schematic / Mimic and As fitted drawings along with O & M manuals should be in operation and will form part of the safe working system.

Detailed records and inspection and test results shall be generated and maintained up to date for all electrical installations and equipment.

4.15 Signs /Posters / Labels

Appropriate notice, labels and posters shall be installed throughout the electrical system as appropriate.

Safety notices will also be used when operating the Permit to Work System and Isolation procedures.

Resuscitation / Electric shock posters shall be installed in switch rooms / Sub stations.

Safety signs

Caution sign

This is a temporary, non-metallic sign bearing the words “caution – persons working on equipment” and “do not touch” which is to be used at a point of- isolation.

Danger sign

This sign is a temporary, non-metallic sign bearing the words “danger live equipment” and “do not touch” which is to be used where there is adjacent live equipment at the place of work.

Switchroom sign

This is a permanent, non-metallic sign bearing the words “electrical switchroom” and “no unauthorised access”.

4.16 Permit to Work Systems

There shall be an Electrical Low Voltage Permit to Work system in place for all the Electrical Systems owned by or which the Trust has responsibility for. See appendix 2 for Permit to Work form for low voltage systems.

Work and or Inspection and testing of the Electrical Systems may require where appropriate to be covered with additional Permit to work systems which are in use such as -

- **Hot works**
- **Confined spaces**
- **Working from Heights**
- **Asbestos**
- **Lone working**
- **Ground excavations**

4.17 Issue of a permit to a contractor

A contractor’s employee may be issued with a permit-to-work, providing the Authorised Person (LV) is satisfied of the capability and competence of the individual.

The manager who approved the issue of the contract to the contractor's company clearly also has a duty to ensure the capability and competence of the company and its employees. The Authorised Person (LV) should be given confirmation that checks have been made.

4.18 Safety Key Boxes

The number of safety key boxes provided for each site for which Authorised Persons (LV) have been appointed is to be decided by the Authorising Engineer (LV):

a. each safety key box is to bear the name of the site and a serial number ensuring positive identification within the site;

b. when in use, each safety key box is to contain the keys to safety locks associated with only one permit-to-work;

c. after the safety locks have been applied, and before a permit-to-work is issued, the keys to all the safety locks are to be placed in a safety key box, and both locks of the box are to be secured. When the permit is issued, the Authorised Person (LV) is to retain the Authorised Person(LV)'s key and give the Competent Person(LV)'s key to the Competent Person (LV);

d. the Competent Person (LV) is to retain the Competent Person (LV)'s key until the permit to-work is cancelled;

e. when not in use, the keys to safety key boxes are to be kept in the working key cabinet.

4.19 Log Book

For each site for which Authorised Persons (LV) have been appointed, a bound hard-covered book (not loose-leaf) with sequentially numbered pages and titled "LV logbook" is to be prepared.

4.20 Isolation of supplies

Before any work starts notification and agreement shall be obtained with all users departments with the (exception of emergencies where danger may be present).

All work on low voltage electrical equipment including conductors should be carried out while such electrical equipment and conductors are dead and isolated from all sources of supply, and after being proved dead at the point-of-work.

Before any work can begin, the electrical equipment and conductors need to be identified and then proved dead at the point-of-work by means of an approved voltage testing device, which must itself be tested in an approved manner immediately before and immediately after its use.

When work is to be carried out on low voltage equipment made dead, all reasonably practicable steps must be taken to prevent the electrical equipment and/or conductors being made live inadvertently during the course of the work, including locking-off any switchgear, removal of any fuses, links or similar approved methods.
Unless a key safe is used, the person working on the equipment should retain any locking-off keys, fuses and links.
When working on electrical circuits these shall be isolated and locked off before work commences.

4.21 Voltage Test Indicators

Authorised Persons and Competent Persons must prove electrical equipment dead by using a voltage test indicator before working on the system.

As there is no British Standard for a voltage test indicator in non-hazardous areas, then the recommendations of the Health and Safety Executive's 'GS38: electrical test equipment for use by electricians'. Test indicators for use on 230/415 V systems should be suitable for use up to 500 V and should indicate a live supply down to 50 V. It should also be able to differentiate between ac and dc.

Test indicators should be proved before and after use from a known supply by using the approved testing unit provided.

4.22 Uninterruptible power supply systems

Under normal circumstances, any work or test undertaken on uninterruptible power supply systems (UPS) will be carried out with the equipment completely isolated from all sources of supply in accordance with Table 4.
Equipment of this type is supplied with an internal bypass designed to allow automatic changeover to the mains supply in the event of a UPS failure. In some instances this bypass is arranged to provide a no-break changeover to mains supply for maintenance, which will not allow the complete isolation.
The Authorising Engineer (LV) in conjunction with the Authorised Person (LV) / I.T. HIS department and where considered necessary the manufacturers of the equipment, is to survey each fixed UPS system and carry out a risk assessment to document the risks involved and to develop operating procedures to be applied before routine maintenance, minor repairs or major repairs can be carried out. In some instances this may involve live working or, in the longer term, modification to the equipment.

4.23 Additional precautions for work on generating plant

When work is carried out on generating plant and directly connected equipment, the following additional precautions should be taken:

The generator must be at rest and isolated from all sources of supply;

The field circuit must be isolated and locked off where it is energised from a separate supply;

Where motor-driven exciters are provided, the switch controlling the motor must be isolated and locked off;

The prime mover providing the motive power to the generator, and any associated valves controlling the flow of fuel or steam, should be isolated and locked off.

In the case of an internal combustion engine prime mover, the starting equipment should also be made inoperative.

Danger and caution signs should be prominently displayed at all points-of-isolation

To ensure a safe system of work, the permit-to-work procedures identified shall apply

Should the installed generator fail and not be able to be kept in service consideration shall be given to hiring a temporary unit.

4.24 Precautions for working on battery installations

The output from the battery should be isolated when working on the equipment it supplies unless for safety reasons the battery output needs to be instantly and permanently available. The battery charger should be isolated.

Where it is necessary to use tools for working on a battery, they should be of an approved insulated type.

The requirements to implement any or all of the precautions for work on live equipment to control maintenance work on battery installations should be determined by the Authorised Person (LV).

If work other than simple maintenance (for example topping up electrolyte levels) is undertaken, this work should only be carried out in full accordance with the precautions detailed within HTM 6-02

4.25 Lightning Conductors

The lightning conductors of buildings shall be maintained by a specialist contractor.
This contractor shall produce schematic line diagrams of each installation showing all connections.
The lightning conductors will be inspected and tested on at least a yearly basis and test results recorded and submitted to the Trust.
The contractor shall be approved and hold all the appropriate certification to carry out the works and inspection and testing in accordance with B.S 6651 / BSEN 62305.

4.26 Work on a low Voltage system associated with a high Voltage system

Where work on a low voltage system requires a high voltage system to be made dead to allow such work, the guidance given in Health Technical Memorandum 06-03 – 'Electrical safety guidance for high voltage systems' should also be applied.

When work on a low voltage system requires a high voltage system to be made dead, isolated and earthed in order to allow such work, a permit-to work should be issued for work on the low voltage system. (The permit should include the isolation and earthing that has been carried out on the HV system in order to make the equipment safe.)

When work on any low voltage system is to be carried out and is associated with work on a high voltage system for which a permit-to-work has been issued, and the low voltage work can only be done while the high voltage system remains dead and earthed:
a) Separate permit-to-work should be issued for the low voltage work,
b) The permit-to-work issued for the low voltage work should detail the equipment made safe for the work to proceed;
c) Cross-reference should be made on both permits to the existence of the other permit, quoting the relevant serial number together with the use of appropriate key safes.

4.27 Model forms

The Following forms or equivalent shall be used

1. Isolation and earthing diagram.
2. Safety programme.
3. Permit-to-work.
4. Limitation-of-access.
5. Certificate of authorisation for live working.
6. Permission for disconnection/interruption of electrical services.
7. Logbook.

4.28 Location of Underground cables

Where it is proposed to carry out excavation work on sites for which Authorised Persons (LV) have been appointed, it is the responsibility of the Authorised Person (LV) when advised to ensure that all underground power cables within the proposed areas of excavation are located and their positions marked before the ground is disturbed.

No person should use cable location and tracing devices unless they are competent to do so and have been specifically trained in their use. A certificate should be issued by the instructor on successful completion of the training. A copy of this should be placed in the operational procedure manual.

Training in the use of cable location and tracing devices should normally be given by the manufacturers of the equipment, but alternatively it may be given by a Competent Person (LV) who has been trained and certified by the manufacturers or an approved training provider.

Before the conductors of a cable are cut or exposed, a point-of-isolation for the cable and the point-of work on the cable are to be identified with certainty.

Identification of a mains voltage or street-lighting cable other than at a labelled termination point may be regarded as clear and certain if the cable can be seen throughout its length, or if it can be clearly seen between the point-of-isolation and the point of- work.

In the absence of clear and certain identification of a cable, it is to be spiked at the point-of-work. Before spiking, it may be necessary to carry out signal injection using the cable cores. Further tests can be repeated after spiking and the results compared. Where only one cable exists in a given location and accurate records indicate that only one cable is present, signal injection may be dispensed with if the Authorised Person (LV) agrees.

The spiking of cables may only be carried out under the direct supervision of an Authorised Person (LV) and by a person who has been specifically trained in the operation of the equipment to be used.

Where more than one cable exists on a single route, the Authorised Person (LV) must identify and label the cable to be worked on. All other cables must be regarded as live, and danger signs attached.

Approved live-working methods may be used as an alternative to spiking. Such work is usually only undertaken by specialist contractors (for example electricity supply companies). If these methods are used, a “certificate of authorisation for live working” should be issued.

4.29 Lone working

Reference should be made to the Trust's lone working arrangements SOP where appropriate.

4.30 Asbestos

Before any work commences clearance must be given by the estates department to confirm that there is no risk from Asbestos to the persons carrying out the work or to any other people that could be affected.

The Asbestos register held in the estates department must be consulted.

4.31 PPE Equipment

All staff shall use the appropriate PPE equipment and should also follow the estates guidance procedures and the Trust's COSSH policy.

4.32 First Aid

Persons working or assisting on electrical systems shall be trained in first aid especially for what to do in the event of electric shock.

4.33 Control of Infection

All the appropriate trusts control of infection procedures and policies shall be adhered to when undertaking work or carrying out the inspection and testing of the electrical systems.

4.34 Method Statements and Risk Assessments

All electrical work, maintenance and the inspection and testing of the electrical systems shall be covered by appropriate method statements and risk assessments.

The Competent Person carrying out the work must be familiar and fully understand the method statement and risk assessment for the task or works to be undertaken.

4.35 Integrity of Fire Compartmentation of Buildings

The integrity of the fire compartmentation within buildings must be maintained
No persons shall destroy damage or break this fabric.

Should the person carrying out any works where fire compartmentation exists and finds this damaged they should report this to the estates department before carrying out the work.

If any works require the need to pass through fire compartmentation or barriers this must be agreed with the estates department in the first instance and once agreed all holes and apertures shall be made good to the standard of the existing fire resistance material already in place

4.36 Control of Contractors Policy

Where contractors may be used they shall operate under the Trust's control of contractor's policy and the associated Permit to work systems which are in place and may be applicable.

4.37 Inspection and Testing of Electrical Systems

Any maintenance or works on **High Voltage installations** shall be under taken by **specialist contractors** under a separate H.V standard operating procedure and permit to work system.

All inspection and testing of **Low voltage electrical installations** shall be in accordance with B.S 7671 IEE wiring regulations (current addition).

All **fixed, portable and transportable equipment** shall be inspected and tested in accordance with the code of practice for In Service Inspection and Testing of Electrical Equipment issued by the IEE institution (current addition).

Recommend frequency of inspection and testing is detailed in the above two documents

4.38 The Main ways of issuing works

PPM dockets
Reactive works

Specifications capital works

4.39 Associated Policies / Standard Operating Procedures (SOP) -

Standby Emergency Generator SOP
Uninterruptable Power Supplies SOP
Electrical High Voltage systems SOP
Permit to work SOP
Control of Contractors policy
Asbestos Policy
Electrical Safety Policy
COSSH
Health and Safety Policy

4.40 User checks of Electrical Equipment

The Trust shall have a visual user check procedure for general electrical equipment
See Appendix 3, 4 & 5 for step by step details.

5 Process For Monitoring Compliance And Effectiveness

The principle activities associated with the Electrical low voltage systems shall be monitored for compliance and effectiveness as follows

Activity	Frequency	Responsibility
Electrical Completion Certificates	As works are Completed	Authorised Persons L . V
Inspection & Testing of Fixed wiring Electrical Test Results	Ongoing & 5 yearly	Authorised Persons
Inspection & Testing of Electrical Equipment	3 monthly Yearly	Authorised Persons
Test results PPM & Reactive works Records	Ongoing	Authorised Persons

Review and Inspection of Electrical system & Training	Annually	Authorised Engineer
Report to Designated Person	Annually	Authorised Engineer

6 References

Electricity at Work Regulations 1989

Health and Safety at Work Act 1974

BS7671 IEE Wiring regulations

The Code of practice for the In Service Inspection and Testing of Electrical Equipment issued by the IEE institution.

HTM 06 – 02 L.V systems

Estates Departments other safety rules and Permit to work systems

IET guidance note 7 Special locations

HTM 06-01 Part A & B design and operational

HSG85 Safe Working Practices

HSG 107 maintaining transportable and portable equipment

HSG 23 Keeping electrical switch gear safe

HSE INDG 236 Maintaining portable equipment in offices and other low risk environments

B S 7621 Requirements for electrical installations

Guidance note 3 Inspection and Testing

HSG47 avoiding danger from underground services

GS 38 Electrical test equipment for use by electricians

HSR25 Memorandum of guidance on the Electricity at Work Regulations 1989

INDG354 Safety in electrical testing works

Provision and Use of Work Equipment Regulations 1998

Electrical Safety Quality and Continuity regulations 1996

BS EN 60529: Specification for degrees of protection provided by enclosures (IP code)

Construction (Design and Management) regulations 2015 (CDM)

B.S 6651 / BS EN 62305 Lightning Conductors

Table 1 Procedures for Competent Persons (LV) working on, or testing, cables and other equipment on the load side of a final circuit

Steps to Follow

1 Identify circuit to be worked on.

Before any work or testing can begin, permission must be obtained from the person in charge of the area to be affected by the work or testing.

2 Isolate and fix signs
(i) Isolate from all sources of supply.

(ii) Make equipment safe to work on or test.

(iii) Fix caution signs at points-of-isolation and where practicable prevent unauthorised connection or operation by fixing safety locks.

(iv) Fix danger signs on live equipment adjacent to the point-of-work or test.

3 Prove dead

(i) Ensure that the equipment to be worked on or tested is the equipment that has been isolated.

(ii) Where practicable, prove dead with a voltage test indicator at the points-of-isolation and at the places where the work or test is to be carried out.

4 Confirm dead
Where it was not practicable in Step 3 to prove the equipment dead, the Competent Person, using appropriate tools and protective equipment where necessary, is to confirm it dead at the point-of-work or test as soon as conductors have been made accessible to a voltage test indicator.

5 Undertake the work or test

Undertake or directly supervise the work or test.

Notes:

1 The Competent Person (LV) is responsible for all tasks.

2 For main intake switches, switchboards, and equipment having two or more sources of supply, cables and other equipment on the supply side of a main intake switch, refer to the Authorised Person (LV) (**see Table 2**).

Except where a risk assessment indicates otherwise, equipment operating at extra low voltage is exempt from these procedures.

Table 2 Procedures to be carried out by an Authorised Person (LV) to enable work on main intake switches, distribution circuits, switchboards, equipment having two or more sources of supply, and cables and other equipment on the supply side of a final circuit

1 Prepare a safety programme

(i) Prepare a safety programme plus an isolation and earthing diagram in duplicate, and obtain countersignatures from another Authorised Person (LV) if required.
(ii) Before any work can begin, permission must be obtained from the person in charge of the area to be affected by the work or test.

2 Isolate and fix signs
(i) Isolate from all sources of supply.
(ii) Fix caution signs at points-of-isolation and where practicable prevent unauthorised connection or operation by fixing safety locks.
(iii) Fix danger signs on live equipment adjacent to the point-of-work or test.

3 Prove dead and earth
(i) Where practicable, prove dead with a voltage test indicator at all the points-of-isolation and at the point-of-work or test.
(ii) If the manufacturer's earthing equipment is available, earth conductors at points-of isolation and fix safety locks.
(iii) Identify cables with certainty or spike underground cables at the point-of-work if the conductors are to be cut or exposed

4 Issue the permit-to-work
(i) The Competent Person (LV) is to be shown the isolation and earthing diagram and the safety arrangements at all the points-of-isolation and at the point-of-work or test.
(ii) Issue to the Competent Person (LV):

- the permit-to-work;
- the isolation and earthing diagram; and
- the Competent Person (LV)'s key to the safety key box.

5 Confirm dead

Where it was not practicable in Step 3 to prove the equipment dead, the Authorised Person (LV), using appropriate tools and protective equipment where necessary, is to confirm dead at the point-of-work as soon as conductors have been made accessible to a voltage test indicator.

6 Undertake the work

The Competent Person (LV) is to undertake or directly supervise the work and on completion, or when the work is stopped and made safe, is to return the original of the permit-to-work, the isolation and earthing diagram and the Competent Person (LV)'s key to the safety key box to the Authorised Person (LV) on duty, and complete part 3 of the permit retained in the pad.

1 The Authorised Person (LV) is responsible for all tasks

Table 3 Procedures to be carried out by an Authorised Person (LV) to enable work on generators

1 Prepare a safety programme

(i) Comply with any particular safety procedures applicable to the location.
(ii) Prepare a safety programme and isolation and earthing diagram in duplicate and obtain countersignatures from another Authorised Person (LV).
(iii) Before any work starts, permission must be obtained from the person in charge of the area to be affected by the work.

2 Isolate and fix signs

(i) Inhibit engine start, isolate generator.
Where practicable, prevent unauthorised connection, operation or starting by fixing safety locks.
(ii) Fix caution signs at all the points-of isolation and, clearly visible, on the engine start panel.
(iii) Fix danger signs on live equipment adjacent to the point-of-work.

3 Prove dead and earth
(i) Where practicable, prove dead with a voltage test indicator at all the points-of-isolation and at the point-of-work.
(ii) If the manufacturer's earthing equipment is available, earth conductors at points-of isolation, and fix safety locks.

4 Issue the permit-to-work
(i) The Competent Person (LV) is to be shown the isolation and earthing diagram and the safety arrangements at all the points-of-isolation and at the point-of-work.
(ii) Issue the permit-to-work, isolation and earthing diagram and the Competent Person (LV)'s key to the safety key box to the Competent Person (LV).

5 Confirm dead
Where it was not practicable in Step 3 to prove the equipment dead, the Competent Person, using appropriate tools and protective equipment where necessary, is to confirm dead at the point-of-work as soon as conductors have been made accessible to a voltage test indicator. Where practicable, earth the conductors after they have been confirmed dead.

6 Undertake the work
The Competent Person (LV) is to undertake or directly supervise the work and on completion, or when the work is stopped and made safe, is to return the original of the permit-to-work, isolation and earthing diagram and the Competent Person (LV)'s key to the safety key box to the Authorised Person (LV) on duty and complete part 3 of the permit retained in the pad.

Notes:

1 Stand-by generating sets started by manual initiation or automatically on receipt of a signal.

2 The Authorised Person (LV) is responsible for all tasks.

Table 4 - Procedures to be carried out by Authorised Person (L.V) to enable work on UPS systems.

1 Prepare a safety programme
(i) Comply with any particular safety procedures applicable to the location.
(ii) Prepare a safety programme and isolation and earthing diagram in duplicate and obtain countersignatures from another Authorised Person (LV).
(iii) Before any work starts, permission must be obtained from the person in charge of the area to be affected by the work.

2 Isolate and fix signs
(i)Isolate from all sources of supply

(ii) Isolate mains supply, battery supply, output supply and any stand-by generator supply.
(iii) On parallel UPS systems and those having an external bypass, isolate the output supply terminals of the unit(s) to be worked on from all sources of supply.

(iv) If the battery installation is to be worked on, follow the rules applicable to work on live equipment, disconnect the battery from its charger and disconnect the battery earth.

(v) Prevent unauthorised connection or unauthorised operation by fixing safety locks and caution signs at points-of-isolation.

(vi) Fix danger signs on adjacent live equipment to the point-of-work.

3 Prove dead and earth
(i) Where practicable, prove dead with a voltage test indicator at all the points-of-isolation and at the point-of-work.
(ii) If the manufacturer's earthing equipment is available, earth conductors at points-of isolation, and fix safety locks.

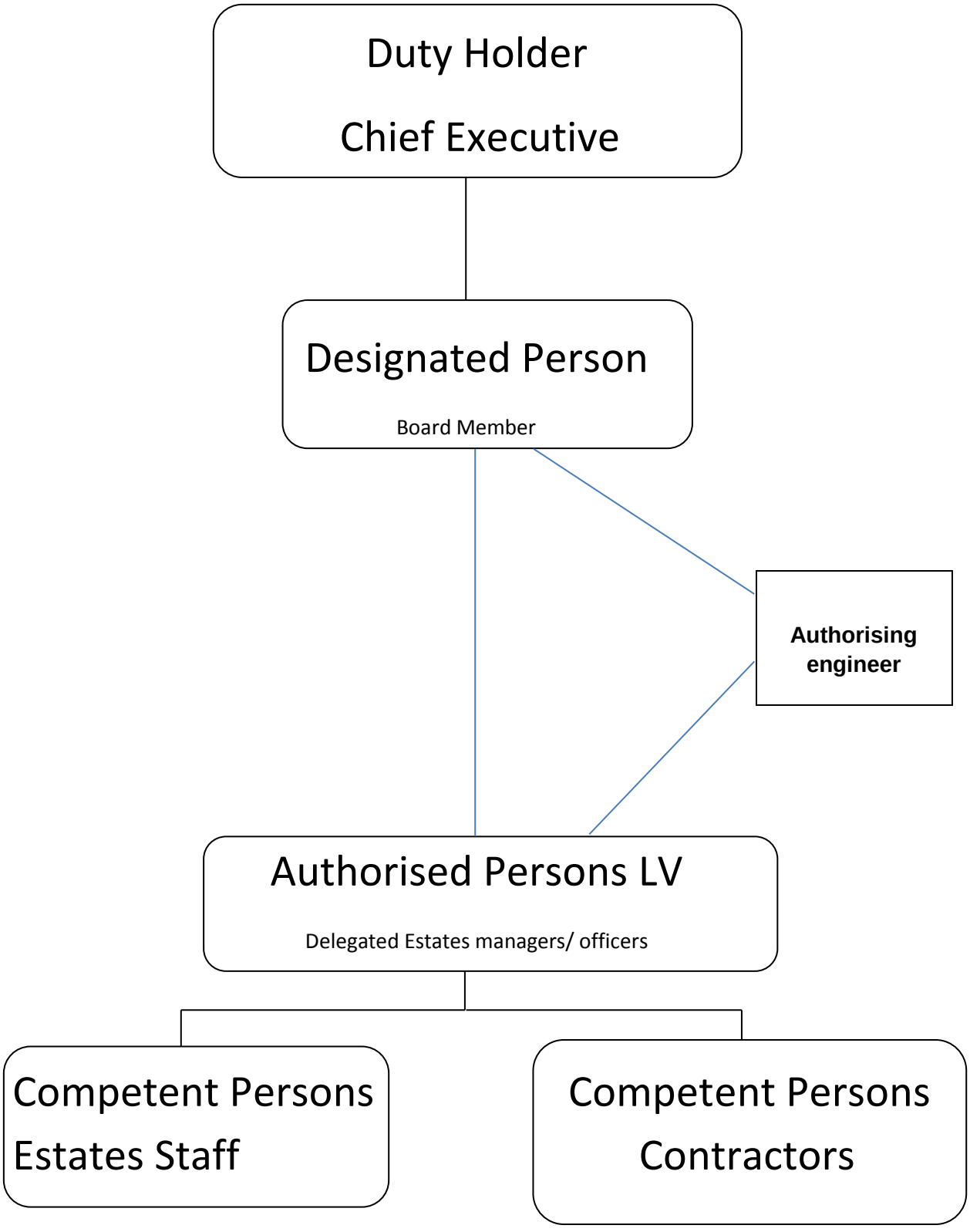
4 Issue the permit-to-work
(i) The Competent Person (LV) is to be shown the isolation and earthing diagram and the safety arrangements at all the points-of-isolation and at the point-of-work.
(ii) Issue the permit-to-work, isolation and earthing diagram and the Competent Person (LV)'s key to the safety key box to the Competent Person (LV).

5 Confirm dead
Where it was not practicable in Step 3 to prove the equipment dead, the Competent Person, using appropriate tools and protective equipment where necessary, is to confirm dead at the point-of-work as soon as conductors have been made accessible to a voltage test indicator. Where practicable, earth the conductors after they have been confirmed dead.

6 Undertake the work
The Competent Person (LV) is to undertake or directly supervise the work and on completion, or when the work is stopped and made safe, is to return the original of the permit-to-work, isolation and earthing diagram and the Competent Person (LV)'s key to the safety key box to the Authorised Person (LV) on duty and complete part 3 of the permit retained in the pad.
Notes:
1 Fixed uninterruptible power supply equipment (excluding portable self-contained "plug-in" units).

2 The Authorised Person (LV) is responsible for all tasks.

Appendix 1 – Flow Chart - Management Structure



Appendix 2 – Permit to Work Procedure

See safe working Practices Permit to work and detailed work sheets held with the Authorised Person L.V

Appendix 3 - User Checks Procedure of Electrical Equipment

Equipment must be switched of before touching plugs and or Electrical Flexes / leads.

Visually Check for:-

1) Damage (apart from light scuffing) to the cable sheath;

2) Damage to the plug, for example the casing is cracked or the pins are bent;

3) Inadequate joints, including taped joints in the cable;

4) The outer sheath of the cable not being 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;

5) The equipment has been subjected to conditions for which it is not suitable, e.g. it is wet or excessively contaminated;

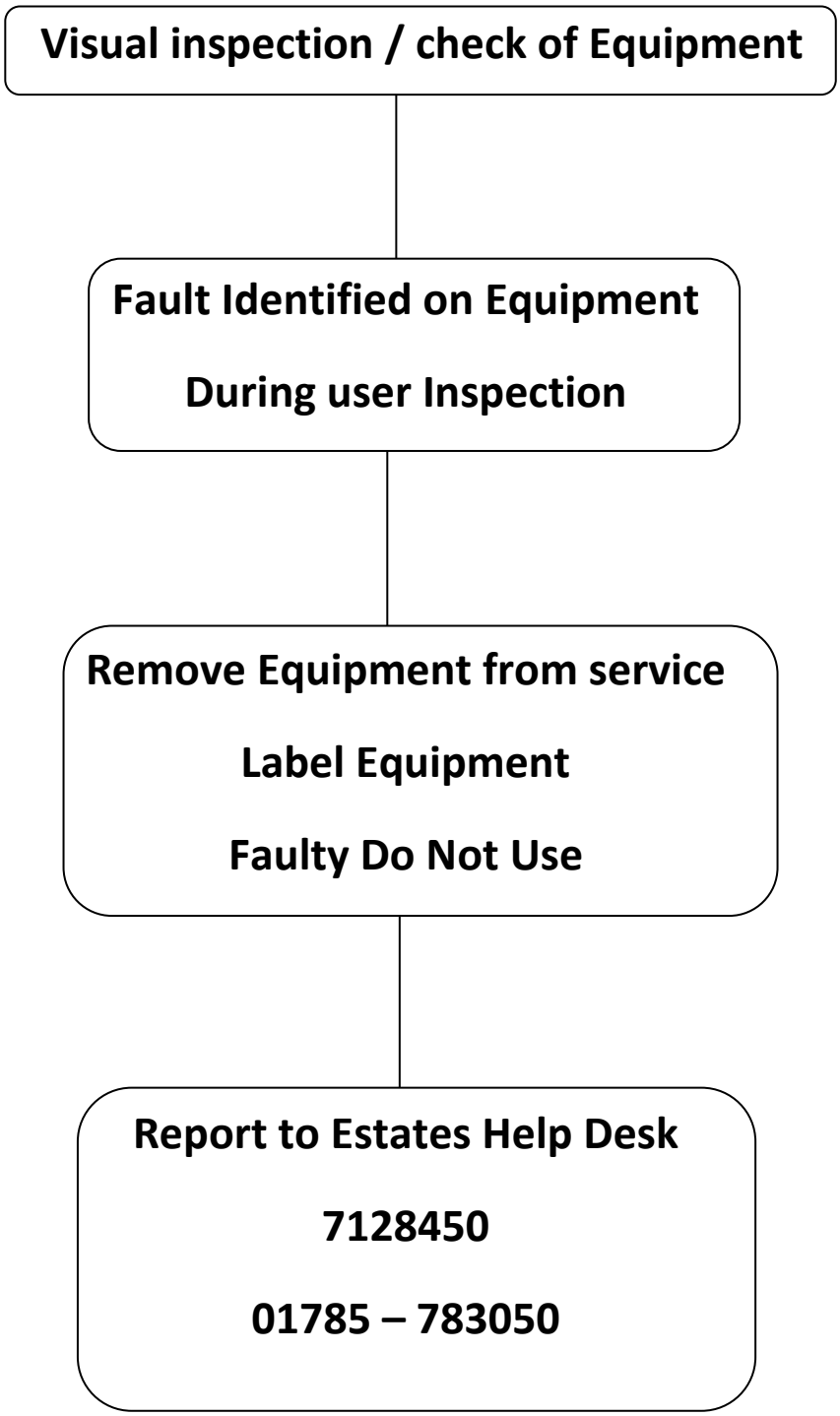
6) Damage to the external casing of the equipment, or there are loose parts or screws;

7) Evidence of overheating (burn marks or discolouration);

8) Physical damage i.e. cracks to facia sockets or any other item of the fixed electrical installation visible to employees.

These checks also apply to extension leads and their associated plugs and sockets.

Appendix 4 – User Procedure for Reporting Faulty Equipment



APPENDIX 5 – User Procedures

What to do if test label on Electrical Equipment is out of date

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