

Title:			
High Voltage Electrical Systems Policy (Estates & Facilities)			
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Executive Summary

NHS Lothian acknowledges the requirement to have measures in place to effectively manage electrical high voltage systems as part of its responsibility as an employer for providing a safe working environment for its employees and others affected by its work.

This policy will help NHS Lothian to reinforce its commitment to the health, safety, and welfare of its employees and stakeholders and ensure measures are in place to comply with current legislation and guidance including:

- Health and Safety at Work Act 1974
- Electricity at Work Regulations 1989
- Provision and Use of Work Equipment Regulations 1992
- SHTM 06-03: Electrical safety guidance for high voltage systems

Implement operating procedures to define how effective management of electrical high voltage systems are to be achieved.

Provide adequate training and awareness information to employees who work on electrical high voltage systems, or manage/supervise those who do, relevant to their level of responsibility.

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1.0 Purpose

This policy is required to set out the duties and responsibilities necessary to ensure safety and compliance regarding all aspects of work involving electrical High voltage systems. This policy will have an accompanying operating procedure document which should be read in conjunction with this document.

2.0 Policy statement

The aims of this policy are:

- To ensure that all persons responsible for the management; operation; maintenance and inspection and testing of any electrical high voltage system, understand their roles and carry out their duties in compliance with the Electricity at Work Regulations 1989.
- To ensure that all Electrical installations and equipment are installed, inspected, serviced and maintained in accordance with all Statutory Requirements, NHS Guidelines, Scottish Health Technical Memoranda or similar, to ensure that such installations and equipment do not pose a health or operational risk to either, staff, patients, or members of the public.

3.0 Scope

This policy applies to all persons (staff, contractors, patients and visitors) who may be affected by any high voltage electrical work being undertaken (including use or contact with electrical equipment) at any of NHS Lothian's properties that are currently owned or leased by the Board, and at any properties that may be purchased or leased in the future.

4.0 Definitions

AE – Authorising Engineer

AP – Authorised Person/s

CP – Competent Person/s

DH – Duty Holder

DNO – Distribution Network Operator

DP – Designated Person

RP – Responsible Person

SOP – Standard Operational Procedures

Audit - the structured process of collecting independent information on the efficiency, effectiveness and reliability of the safe system of work, and drawing up plans for corrective action. ('Independent' does not necessarily mean external to the organisation.)

Circuit Earth - a point within any given circuit where the potential of all other voltages in the circuit are referenced.

Contractors - all parties who undertake work for, or on behalf of NHS Lothian. This includes tradespersons brought in for a specific task or time period but not those who have an on-going supply agreement with the Board.

Electrical equipment - anything used, intended to be used or installed for use in order to generate, provide, transmit, transform, rectify, convert, conduct, distribute, control, store, measure, or use electrical energy.

Employees - all direct NHS Lothian employees and agency staff

Voltage Range - This is defined in Scottish Health Technical Memorandum (SHTM 06-03).

1. Extra-Low voltage: a potential not exceeding 50V ac or 120V ripple-free dc, whether between conductors or to earth.
2. Low voltage (LV): a potential not exceeding 1,000V ac or 1,500V dc, between conductors, or 600V ac or 900V dc between a conductor and earth.
3. High voltage (HV): a potential normally exceeding low voltage.

Mechanical Isolation – a means of isolating non-electrical supplies (gas, air, water etc) to allow maintenance on the non-electrical parts of equipment, plant and machinery.

Method Statement – A document outlining the exact process to be followed for a particular task to be completed safely. The statement need be no longer than necessary to achieve these objectives effectively.

Permit to Work - a documented procedure that authorises certain people to carry out specific work within a specified time frame. It sets out the precautions required to complete the work safely, based on a risk assessment. It describes what work will be done and how it will be done; the latter can be detailed in a 'method statement'.

Personal Protective Equipment (PPE) - equipment that will protect the user against health or safety risks at work. It can include items such as safety helmets, gloves, eye protection, high-visibility clothing, safety footwear and safety harnesses.

Scottish Health Technical Memorandum (SHTM) – a series of documents which detail best practice guidance for healthcare engineering.

Stored Energy – energy present within items of electrical apparatus, such as batteries and capacitors, which pose a threat even after the isolation of equipment.

Sub-Station – means any premises, or that part of the premises, in which electrical energy is transformed or converted to or from pressure above low pressure except for the purposes of working instruments, relays, or similar auxiliary apparatus, if such premises or part of premises are large enough for a person to enter after the apparatus is in position.

Switchgear – any apparatus within the electric power system, or grid, refers to the combination of electrical disconnects, fuses and/or circuit breakers used to isolate electrical equipment.

Technical Knowledge – Specific knowledge needed to carry out work on electrical High voltage systems. This can be demonstrated in the form of a combination of qualifications and practical experience.

5.0 Implementation roles and responsibilities

5.1 Management

The Chief Executive and his nominated staff as duty holders are responsible for the safety of High voltage (HV) electrical 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 the ones imposed by the Health & Safety at Work Act 1974. Management must formally nominate in writing a 'Designated Person' with responsibility for the HV Electrical Safety Policy.

5.2 Designated Person

An individual who has overall authority and responsibility for the High voltage electricity system within the premises and who has a duty under the HSW Act 1974 to prepare and issue a general policy statement on health & safety at work, including the organisation and arrangements for carrying out that policy. This person should not be the authorising engineer - NHS Lothian's Head of Estates is normally appointed as the designated person.

It is the responsibility of the designated person to:

- Appoint in writing an Authorising Engineer (HV) for all systems and installations for which management has responsibility.
- Review the AE (HV)'s appointment annually to ensure their duties have been carried out in accordance with all relevant guidance and legislation including SHTM 06-03.
- Designated Person to appoint Authorised Persons (HV) on recommendation of Authorised Engineer
- Agree any local variations from this guidance.

5.3 Authorising Engineer (HV)

A chartered engineer with appropriate experience or an incorporated electrical engineer, who possesses the necessary degree of independence from local management and is appointed in writing by the 'Designated Person' to implement, administer and monitor the application of SHTM 06-03.

The Authorising Engineer (HV)'s responsibilities include the following:

- Assess and recommend in writing sufficient 'Authorised Persons' (HV) to provide the necessary cover for all systems and installations for which management has responsibility.
- Define the exact extent of the systems and installations for which each Authorised Person (HV) is responsible and, where appropriate, any part of the system which is excluded from the Authorised Person (HV)'s responsibilities.
- Maintain a register of all Authorised Persons (HV).
- If necessary - recommend the suspension or cancellation of the appointment of an Authorised Person (HV) and withdraw the certificate.
- Ensure that candidates for appointment as Authorised Persons (HV):
 - satisfy the qualification, training and familiarisation requirements.
 - can demonstrate competence, ability, and adequate knowledge of each system, installation and type of equipment for which authorisation is sought

5.4 Authorised Person (HV)

An individual possessing adequate technical knowledge and having received appropriate training. An Authorised Person (HV) is appointed in writing by the Designated Person on the recommendation of the Authorising Engineer (HV) and is responsible for the implementation and operation of SHTM 06-03 with regard to working on, or the testing of electrical High voltage systems.

Although there may be more than one appointed AP(HV) within an area, there must only be one on duty at any given time and handover between APs should be recorded in the operational logbook.

The Authorised Person (HV)'s responsibilities include the following:

- Control the work on High voltage systems, prepare inspection, maintenance and safety programmes and progress the work.
- Ensure that any alterations or installation of equipment do not compromise the electrical system; – Ensure that all records concerning High voltage systems are kept up to date.
- Ensure that any person working on the system is competent to do so.
- Ensure that test equipment is maintained in good condition.

- Cooperate with the Authorising Engineer (HV) in matters of policy concerning High voltage systems.
- Report in writing any dangerous and/or unusual occurrences to the Designated Person and Authorising Engineer (HV). – Make routine inspections of HV substations, switchrooms, and electrical enclosures at least once every 3 months.
- Ensure that the necessary warning signs are displayed in sub-stations at all times;
- Deciding the following prior to the issue of a safety document:
 - whether live working is essential.
 - whether circuit earths are required, and if so, the number and points of application.
 - whether any action is required to contain or dissipate stored energy.
 - whether any additional precautions are necessary, for example mechanical isolation.
 - whether personal supervision is required.
 - safety has been achieved and will be maintained where the requirements of the safety document are completely implemented.
 - the contents of the safety document to be issued are correct and unambiguous.
- When issuing a safety document:
 - ensure that the contents of the safety document are fully explained to the recipient, and that the recipient understands the nature and extent of the work or testing to be done and the safety precautions to be taken.
 - provide any keys as appropriate and note any circuit earths considered necessary.
- When cancelling a safety document:
 - ensure that the declaration (clearance section) has been signed and the requirements satisfied.
 - Competent Person / Contractor's Copy to be destroyed in presence of authorising officer.

5.5 Competent Person (HV)

Individuals recognised by the Authorised Person as having sufficient technical knowledge and experience to work on the HV system and prevent danger and risk of injury. They will not normally be employed by NHS Lothian.

The Competent Person (HV)'s responsibilities can be summarised as:

- Competent persons (HV) shall use safe methods of work, safe means of access and the personal protective equipment and clothing provided for their safety.
- Competent persons (HV) when in receipt of safety document, shall:
 - be fully conversant with the nature and the extent of the work to be done.
 - read the contents and confirm to the person issuing the safety document that they fully understand.

- during the course of the work, adhere to, and instruct others under their charge to adhere to, any conditions, instructions or limits specified on the safety document.
- retain the safety document and (where appropriate) keys in safe custody, and correctly implement any management procedure to achieve this.
- when in charge of work, provide immediate or personal supervision as required.
- warn all persons as quickly as possible to withdraw from, and not to work on, the equipment concerned until further notice if a hazard arises, or is suspected, during the course of work which could result in danger. The situation shall be reported immediately by the competent person to an authorised person.
- Competent persons (HV) clearing a safety document shall do so only after all persons working under the safety document have been withdrawn from, and warned not to work on, the equipment concerned. Where appropriate, they shall ensure that all tools, gear and loose material have been removed, guards and access doors replaced, and the workplace left tidy in a safe condition.

5.6 Accompanying Safety Person (HV)

An individual not involved in the task 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 will be familiar with the installation or existing HV system being worked / tested on and will have been instructed on the action to be taken to rescue a person safely in the event of an accident.

The Accompanying Safety Person (HV) shall be trained to recognize imminent danger, cut off supplies, and shall hold a valid First Aid training certificate.

The Accompanying Safety Person (HV) shall be present whenever the Authorised Person (HV) deems it necessary, and in the following circumstances:

- While equipment is being proved or confirmed dead.
- While equipment is being earthed, other than by means of a switch or circuit breaker.
- Where equipment cannot be confirmed dead until the Competent Person (HV) has made conductors accessible.
- While the Authorised Person (HV) is spiking a cable.
- While testing is being undertaken at high voltage.
- While a high voltage potential indicator is in use.
- While voltage and phasing tests are being undertaken at high voltage.
- While any person is opening or working in a high voltage enclosure.

5.7 Legal Requirements

5.7.1 Delegation of Responsibility to Comply with The Regulations

It shall be the duty of the Authorised Persons (HV) to comply with these regulations. It shall also be the duty of all Competent Persons, Craftspersons, and persons employed to conduct their work in accordance with the regulations.

Further guidance is contained in Scottish Health Technical Memorandum - 06-03 Electrical safety guidance for high voltage systems.

5.7.2 Person in Charge of a Sub-Station

All substations should be kept locked, the locks being identical so that a single key will enable access to be gained to any substation over which Management has control or a degree of control on a site.

5.7.3 The Authorised Person

The Authorised Person means (a) the Estates Officer, or (b) a Contractor for the time being under contract with the Estates Officer, or (c) a person employed, appointed, or as aforesaid, to carry out certain duties incidental to the generation, transformation, distribution, or the use of electrical energy, such Estates Officer, Contractor, or person being a person who is competent for the purpose of the regulations in which the term is used.

6.0 Associated materials

NHS Lothian Standard Operating Procedure for the Management of Electrical High Voltage Systems (to be drafted). The responsibility for the approval of the above procedure sits with the NHS Lothian Facilities Policy Group.

7.0 Evidence base

- <https://www.hse.gov.uk/>
- HSG253: The safe isolation of plant and equipment
- Health and Safety at Work Act 1974
- Electricity at Work Regulations 1989
- BS7671:2018 | IET Wiring Regulations | 18th Edition
- Provision and Use of Work Equipment Regulations 1992
- Scottish Health Technical Memorandum - 06-03

8.0 Stakeholder consultation

This policy has been discussed and reviewed by Estates Management, Partnership and relevant Authorising Engineer.

The draft policy was placed on the NHS Lothian Consultation Zone to give all NHS Lothian staff an opportunity to provide feedback/comment.

9.0 Monitoring and review

To ensure the maintenance and operational arrangements remain effective, the condition and performance of all electrical systems should be continually monitored.

The following arrangements should be in place:

- Checking the performance of the system and its component parts.
- Checking the safety logbook, limitation of access permit, permit to work and Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR) report documentation.
- The safety procedures will be subject to an annual review with regard to safe working practices and the competence of staff for their assigned duties.
- All local procedures and performance data should be updated as a result of annual monitoring and auditing by the appointed Authorising Engineer (HV).
- The Authorising Engineer (HV) will identify any remedial actions required and these shall be actioned and recorded. – This policy should be reviewed 3 years from the date of issue or sooner as a result of any audit findings which identify significant gaps, failures, omissions, or immediate risks. The policy should also be reviewed sooner if there have been relevant changes in legislation, guidance, changes to personnel, procedures or protocols during this period.