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| **Compressed Public Health Wales logo** | **Reference Number: PHW10/** TP14**Version Number:** V2**Date of next review:** 22 Jan 2023 |
| **Low Voltage Electrical Safety and Electrical EquIpment Procedure** |
| **Procedure Statement**This procedure contains the protocol for the management of the maintenance of Public Health Wales’ low voltage electrical equipment and infrastructure.This procedure aims to describe the correct procedure for ensuring electrical safety for Low Voltage (LV) services for Public Health Wales. |
| **Policy Commitment**This procedure sets out Public Health Wales’ commitment to ensure that:* All electrical equipment complies with the relevant statutory and industry standards and is inspected, tested, maintained and operated as required to ensure that risks to persons who may be affected by the equipment are controlled and any potential danger to health avoided.
* Staff and when appropriate visitors, are given information, instruction, training as appropriate to their involvement with electrical equipment.

The main pieces of legislation covered within this procedure are the Health and Safety at Work Act 1974, the Electricity at Work Regulations 1989, Institution of Electrical and Technology (IET) British Standard - BS7671:2018 IET Wiring Regulations 18th Edition, and The Waste Electrical and Electronic Equipment (WEEE) Regulations 2013  |
| **Supporting Procedures and Written Control Documents**Other related documents are:Health and Safety Policy, Fire Safety Policy, Control of Contractors Procedure, Provision and Use of Work and Lifting Equipment Procedure, Asbestos Management Procedure, Healthcare Technical Memorandum 06-01: Electrical services supply and distribution (HTM06-01) 2018; Healthcare Technical Memorandum 06-02: Electrical safety guidance for low voltage systems 2006 |
| **Scope**This procedure and any arrangements made under it applies to:All persons employed or engaged by Public Health Wales, including part time workers, temporary and agency workers, those holding honorary contracts and hosted bodies  |
| **Equality and Health Impact Assessment**  | Insert link to completed **Integrated Screening Tool**.  |
| **Approved by** | Health and Safety Group |
| **Approval Date** | 22 January 2020 |
| **Review Date** | 22 January 2023 |
| **Date of Publication:** | TBC |
| **Group with authority to approve supporting procedures**  | Health and Safety Group |
| **Accountable Executive Director/Director** | Huw George, Deputy Chief Executive and Executive Director of Finance and Operations. |
| **Author** | Nicola White, Health and Safety Manager  |

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| Disclaimer**If the review date of this document has passed please ensure that the version you are using is the most up to date either by contacting the document author or** **Corporate Governance.** |

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| **Summary of reviews/amendments** |
| **Version number** | **Date of Review** | **Date of****Approval** | **Date published** | **Summary of Amendments** |
| v1 |  |  | 29 April 2021 | variations in appendix c approved by the health and safety group  |
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1. **Aims**

The purpose of this document is to ensure that there are vigorous processes in place to ensure that electrical safety for low voltage is managed correctly in line with current legal and other requirements.

The table below identifies the range of Voltage to determine its category as described in HTM06-01;

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| **Category** | **Voltage Range (V)** |
| **Non-Medical locations** | **Medical locations** |
| Extra low voltage | AC 50 V or DC 120 V ripple-free  | AC 25 V/DC 60 V  |
| Low Voltage  | Normally not exceeding AC 1000 V or DC 1500 V  |
| High Voltage | Normally exceeding AC 1000 V or DC 1500 V (typically, for AC this will be 11 kV, 6.6 kV or 3.3 kV).  |

1. **Objectives**

Through the implementation of this procedure, the organisation aims to achieve the following key objectives in relation to the management of electrical safety:

* compliance with all applicable legislation and other requirements
* prevention of pollution
* reduction of injury and risk
* reduction in expenditure
* continual improvement and investment

As part of providing a safe working environment in all the organisations work settings, Public Health Wales will ensure that electrical equipment e.g. portable/ transportable appliances are used safely by providing instruction and ensure that equipment is safe for use by conducting safety checks.

Managers will ensure that the safety checks are conducted on equipment which will consist of:

* A visual (pre-use and during use) check (appendix A&B)
* A six monthly scheduled, recorded formal visual check (appendix C)
* Where necessary a Portable Appliance Test.
1. **Procuring Electrical Equipment**

It is the responsibility of local purchasers to ensure that items of equipment purchased can be safely connected to the local electrical supplies. On occasion, this may require consultation to some degree with the organisation’s Estates Safety and Facilities Division. Staff hosted within Health Boards should contact their local Health Board Estates’ Department. Managers shall ensure that the person procuring electrical equipment are sufficiently knowledgeable to safely select equipment that is suitable for the intended purpose and working environment and is fit for connection to the organisation’s / host’s supplies. When selecting equipment, consideration in the first instance must be given to the use of extra low voltage or battery powered equipment.

When selecting fixed electrical equipment the organisation’s Estates, Safety and Facilities Division or a host organisation’s Estates Department must always be consulted.

1. **Maintenance of equipment**

Fixed items of electrical equipment must be routinely maintained in accordance with the manufacturer’s stipulations or via a suitably adopted risk assessment.

Arrangements for maintenance are required to be in place for all portable electrical appliances. The Estates, Safety and Facilities Division will undertake this responsibility. However, managers must ensure that all equipment to be tested is made available when Estates Safety and Facilities Divisional staff or a nominated contractor is undertaking periodic checks.

1. **Maintenance of the Trust’s Electrical Infrastructure**

In areas where Public Health is deemed the Duty-holder (i.e. Breast Test Wales, Cathedral Road, Cardiff), maintenance of the fixed electrical installation (e.g. ring main, lighting circuits, distribution systems etc.) is the responsibility of the Estates, Safety and Facilities Division. No other member of staff or contractor shall install and connect equipment or interfere with the fixed electrical network unless the work has been authorised by the Estates, Safety and Facilities Division.

1. **Safety Inspection and Testing Operational Safety Instructions**

It is the responsibility of all staff, without exception, to take reasonable steps to establish the visual safety and integrity of any items of electrical equipment before the energy supply is connected to that item and put into use. Any defects must be reported to the Facilities Helpdesk via email; PHW.Facilities@wales.nhs.uk immediately and the equipment should not be used. The equipment must then be labelled accordingly by staff to ensure its use is avoided. Damaged IT equipment should be labelled up and not used and the IT division inform immediately.

1. **Fixed Electrical Installations**

Safety inspections and testing of the fixed electrical installation and fixed electrical equipment must be carried out at a maximum of every five years. The precise frequency is to be determined by the outcome of a local divisional risk assessment undertaken by a competent person. For further advice, contact the Estates, Safety and Facilities Division. The inspections and tests must comply with the requirements of BS7671:2018 Periodic Inspection Reports for Electrical Installations 18th edition. The Estates, Safety and Facilities Division will make necessary arrangements of the maintenance of the organisation’s infrastructure in conjunction with landlords / host organisations where applicable as part of its estate management processes.

1. **Fixed Electrical Equipment**

The asset register of fixed electrical equipment is currently held by the Finance Division. Advice should be sought from the Finance Division on items that need to added/removed from the register. Individual divisional managers are responsible for notifying the Finance Division when new or replacement fixed items of equipment are purchased and old equipment disposed of. This will ensure the register is updated accordingly and test regimes adjusted as necessary.

1. **Portable Electrical Appliances**

Inspection and testing of portable electrical equipment is the responsibility of the Estates, Safety and Facilities Division. Where hosted the inspection and responsibility for testing may be undertaken by host provider.

An asset register of the organisation’s equipment is held by the Finance Division and monitored by the Estates, Safety and Facilities Division. However, this does not remove the obligation from divisional managers to notify the Estates, Safety and Facilities Division accordingly when new items of equipment are brought into service or when items are transferred from one point of use to another.

The frequency for inspection and testing is dependent on the equipment and the amount it is moved. This can vary from one to a maximum of five years for equipment such as computers, printers and photocopiers. Portable electrical equipment that creates the greatest risk to staff, service users or the public may be tested more frequently as deemed necessary. All testing to include user visual inspection will be carried out in accordance with the HSE Guidance Note *Maintaining portable and transportable equipment HSG 107 (3rd edition)*. The guide is available at;

<http://www.hse.gov.uk/pubns/books/hsg107.htm>

After an item of electrical equipment has been inspected and or tested, the asset and local registers should be updated and a suitable label displayed on the equipment. The label must show as a minimum, the date when the equipment was tested and the date when it is due for its next inspection or test.

If an item of equipment is found to be unsafe, it must be withdrawn from use or disconnected from its power source immediately until repaired and re-tested or deemed beyond repair, at which point the item must be disposed of appropriately.

1. **I.T. Equipment**

I.T. items of equipment are classified as portable appliances. The arrangement for the inspection is managed by the Informatics team and testing of I.T. items of equipment is normally achieved through the test programme for General Class 1 & 2 items. The period of time between inspections being varied in line with HSE Guidance as provided in link above (point 8)

New I.T. equipment with an approved CE Kite mark does not necessarily need testing from new. However, a visual inspection is required before initial use. Prior to IT cabling being installed the Estates, Safety and Facilities Division must be contacted to ensure all documentation required to satisfy the Construction, Design Management Regulations 2015 is provided.

1. **Equipment not owned by Public Health Wales**

Under no circumstances must items of electrical equipment be connected to the organisation’s or a host organisation’s electrical supply without first consulting with and seeking consent from the Estates, Safety and Facilities Division. In most cases, the Estates, Safety and Facilities Division will allow connection following a successful safety test. In other cases, connection of the equipment may not be permitted due to limited site supply capacity grounds.

**NOTE: Public Health Wales will accept no responsibility for any damage caused to personal items of electrical equipment that have been subjected to a flash or other voltage injection test during the course of establishing overall electrical safety**.

1. **Competent Person(s)**

Persons carrying out installation, maintenance, inspection, testing or any other work associated with electrical equipment must be sufficiently competent. In this sense, competence means that they should have sufficient knowledge and experience which may include:

* Adequate knowledge of electricity and the applicable regulations (IET Wiring Regulations -18th edition and to British Standard - BS 7671:2018)
* Adequate experience of electrical work
* Understanding the hazards and dangers that may arise during the work and the precautions that need to be undertaken.
* Ability to recognise at all times whether it is safe for work to continue.
1. **Information, Instruction and Training**

All staff who are required to use, install, maintain, inspect or test electrical equipment must be provided with the appropriate information, instruction and training to enable them to carry out their work in a safe manner and to recognise potential electrical hazards.

1. **Live Working**

Public Health Wales does not permit any form of live working under normal circumstances. Whenever possible, maintenance contractors are to test each point of contact and confirm each point dead before commencing work. It is recognised that this may cause inconvenience but is essential to minimise the likelihood of death or serious injury.

In some circumstances however, live working is unavoidable and absolutely necessary, such as fault finding. In these circumstances, live working is permitted provided the following controls are in place:

* the designated competent contractor must continue the work until completed and must not be diverted to other work
* a written risk assessment and safe system of work is agreed by all relevant parties and signed off by the Authorised Engineer / Authorised Person for Low Voltage at Shared Services Partnership.
* all personal protective equipment (PPE) necessary is used
* live working tools are used
* at least a minimum of two persons are deployed to the task
* if a “live functional test” or ‘certificate of authorisation’ for live working is required, it must be issued by the authorised engineer at Shared Services Partnership. They **must** sign the appropriate permit prior to commencement of work.
* that the appropriate infrastructure is available i.e. residual current device (RCD) protection, emergency stops etc.
1. **Defective Equipment**

Anyone discovering a faulty item of electrical equipment must ensure that the equipment is not used again until made safe. This may require the equipment to be locked away, the plug being removed and the item labelled to show that it is faulty. Individuals identifying an item as faulty equipment should ensure that details and remedial action taken is reported to their line manager, the Estates, Safety and Facilities Division or other appropriate nominated person. The equipment must remain out of service until the necessary repairs and associated tests have been carried out. Any condemned item of electrical equipment must be disposed of in line with the organisations Waste Management Policy on the disposal of electrical items and in accordance with The Waste Electrical and Electronic Equipment (WEEE) Regulations 2013.

1. **Disposal of Electrical Equipment (The Waste Electrical & Electronic Equipment (WEEE) Regulations 2013**

The Waste Electrical and Electronic Equipment (WEEE) Regulations 2013 became law in the UK in January 2014 and puts a legal obligation on the organisation to dispose of all waste electrical items in accordance with strict guidance. Wherever possible the waste has to be re-used or recycled. Waste electrical goods now need to be segregated from domestic waste, therefore when disposing of items they must not be thrown out with normal rubbish. Items must be clearly labelled ‘electrical goods for disposal’ to ensure they are segregated out before disposal. For further information please refer to Waste Management Policy PHW 63;

<https://phw.nhs.wales/about-us/policies-and-procedures/policies-and-procedures-documents/risk-management-health-and-safety-and-estates-policies/waste-management-policy/>

1. **Records**

Where working in hosted premises, suitable records must be kept locally and will be provided by the Estates, Safety and Facilities Division for:

* inspections, tests and maintenance of all electrical equipment
* information, instruction and training provided to staff

Records are also held centrally by the Estates, Safety and Facilities Division to ensure the organisation complies with all relevant legislation.

1. **Prohibited Equipment and Practices**

The use of extension leads, multi sockets adaptors or trailing sockets is to be discouraged on Public Health Wales’ premises. In cases where and when the use is absolutely necessary, all sockets and extension leads must bear an approval mark, e.g. the CE Kite mark, IEC mark, BS 1363A or BS4343 marks and must be tested for electrical safety and suitability of application by the Estates, Safety and Facilities Division. Only surge protected extension leads should be used and not be connected to other extension leads (‘daisy chained’) under any circumstances.

The use of toasters is strictly prohibited. Kettles are only to be used within the organisation’s designated kitchen area and tea points. The use of these appliances is not permitted in any other area under any circumstances.

**18. Monitoring and Audit**

Managers shall as part of their daily duties and during inspections ensure that staff are using electrical equipment safely and in the correct manner.

The Estates, Safety and Facilities Division will issue the Formal Visual Checklist electronically every 6 months and monitor compliance with this procedure by reviewing submitted individual returns (Appendix C). In addition keeping a record of all portable electrical equipment within that have been PAT tested.

Further adherence to this procedure will be monitored during the undertaking of health and safety inspection audits at each premise.

**19. Definitions**

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| **Electrical Equipment** | Anything used, intended to be used or installed for use, to generate, provide, transmit, rectify, convert, conduct, distribute, control, store, measure or use electrical energy  |
| Fixed Electrical Installation Or Electrical Infrastructure  | The whole of the electrical distribution system of a building up to the point of supply to the “end-user‟. This installation will usually be terminated by means of socket outlets for connection of Portable Electrical Equipment or local isolators for the connection of Fixed Electrical Equipment.  |
| Fixed Electrical Equipment  | Any electrical equipment of a “permanent‟ nature connected to a mains supply by any means other than a conventional plug top (even if the equipment was designed to be portable or transportable).  |
| Portable Electrical Equipment  | Any electrical equipment connected to its mains supply by means of a plug top and capable of being transported or moved. Items of electrical equipment weighing in excess of 18kg that are not regularly moved should be treated as fixed electrical equipment. (With exception of EBME Medical Equipment)  |
| Class I Electrical Equipment  | Equipment having only basic (functional) insulation and which rely for safety on exposed metalwork having a permanent connection to earth. This connection to earth is normally provided by the equipment’s mains cord or flexible cable. In the event of a fault occurring, the earth conductor (wire) will carry the excess (fault) current and cause the mains fuse to „blow‟ thus disconnecting the equipment from the mains supply. Equipment of this type is dependent for its safety on the “fixed‟ installation providing a suitable earth return path.  |
| Class II Electrical Equipment  | Equipment that relies for its safety on additional insulation, this being applied as either reinforced insulation or double insulation. This additional insulation ensures that in the event of a fault, the person using the equipment does not come into contact with hazardous or dangerous voltages. This type of equipment is identified by the markings, Class II, Class 2 and will normally carry the double insulated symbol of two concentric squares. Equipment of this type is not dependent for its safety on the “fixed‟ installation.  |
| Extra Low Voltage  | Electrical energy supplied at a voltage of less than 50 volts  |
| Low Voltage  | Electrical energy supplied at a voltage of between 50 and 1,000 volts.  |
| High Voltage  | Electrical energy supplied at a voltage in excess of 1,000 volts  |
| Live Working  | Maintenance, repair, installation or testing/inspection work on electrical systems plant or equipment when the electrical energy supply remains connected  |
| Dead Working  | Maintenance, repair, installation or testing/inspection work on electrical systems plant or equipment when the electrical energy supply has been disconnected  |

**Appendix A - Typical user inspection checklist for fixed electrical equipment fitted with/without Residual Current Device**

Check the test date has not expired.

Then check for signs of:

* Damage to the local isolator or service switch;
* Damage to plastic or metal conduits, armoured cables
* The flexible conduit or cable not being firmly gripped where it enters the local isolator or service switch and the equipment. Look to see if the coloured insulation of the internal wires is visible.
* Damage to the flexible conduit or cable outer sheath, for example, cuts, crushing, and slight abrasion – scuffing is acceptable.
* Damage to the outer case of the equipment, for example cracks in the outer cover, loose switches, loose parts and screws.
* Overheating, for example burn marks, staining and pungent acrid smells.

In addition, check that:

* The on/off switch or stop/start buttons function correctly.
* Any warning devices, for example, lamps and indicators are operational.
* Mechanical levers operate correctly and without excessive force being required.
* The equipment works correctly and efficiently.

The following additional inspection should be made if the equipment is protected by an RCD (Residual Current Device) or connected by a plug conforming to BS4343.

Checking for RCDs that:

* The RCD can be manually switched on and off.
* The RCD trips when the TEST button is pressed.
* Checking for plugs conforming to BS4343 that:
* Any interlock provided ensures that the plug cannot be removed whilst the outlet is switched on.
* The wires, including the earth wire when fitted, are connected to the correct terminals.
* No bare wire is visible except at the terminals.
* The terminal screws are tight.
* There is no sign of internal damage, for example cracks, overheating, excess dirt, oil or dust.
* The sealing gland, if fitted, is intact and the gland nut tightened.

**Appendix B -Typical user inspection checklist for portable electrical equipment fitted with/without Residual Current Device**

First, check that the test date has not expired.

**Then check for signs of:**

* Damage to the mains plug, for example burnt, cracked or loose casing or bent pins.
* Non-standard joints including taped joints in the flexible cable.
* The outer covering (sheath) of the flexible cable not being firmly gripped where it enters the mains plug or the equipment. Ensure that the coloured insulation of the internal wires is not visible.
* Damage to the flexible cable outer sheath, for example cuts, abrasions – slight scuffing is acceptable.
* Damage to the outer case of the equipment, for example cracks in the outer cover, loose switches, loose parts and screws.
* Overheating, for example burn marks, staining and pungent acrid smells.
* Check for signs of possible water ingress.

**In addition, check that:**

* The on/off switch functions correctly.
* Any warning devices, for example lamps, audible indicators are operational.
* Mechanical levers/interlocks operate correctly and without excessive force being required.
* The equipment works correctly and efficiently.

The following additional inspection should be made if the equipment is protected by an RCD (Residual Current Device) or connected by a plug conforming to BS4343.

Checking for RCDs that:

* The RCD can be manually switched on and off.
* The RCD trips when the TEST button is pressed.
* Checking for plugs conforming to BS4343 that:
* Any interlock provided ensures that the plug cannot be removed whilst the outlet is switched on.
* The wires, including the earth wire when fitted, are connected to the correct terminals.
* No bare wire is visible except at the terminals.
* The terminal screws are tight.
* There is no sign of internal damage, for example cracks, overheating, excess dirt, oil or dust.
* The sealing gland, if fitted, is intact and the gland nut tightened.

**Appendix C**

**Checklist - Portable electrical equipment (Formal Visual Inspection)**

To carry out a formal visual inspection you don’t need to be an electrician, but you do need to know what to look for and you must also have sufficient knowledge to avoid danger to yourself and others. If you are in any doubt, please advise your Line Manager.

Formal Visual inspections should be carried out before most electrical equipment is used, with the equipment disconnected and, as part of the visual inspection, you should consider whether:

* The electrical equipment is being used in accordance with the manufacturer’s instructions
* The equipment is suitable for the job
* There has been any change of circumstances; and any other user has reported any issues.

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| **Name:** |  |
| **Equipment Checked:** |  |
| **Date:** |  |

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| **Check criteria** | **Condition of Equipment** | **Comments** |
| **Ok** | **Not Ok** |
| 1. Check for cuts through outer covering in electrical cabling. |   |   |   |
| 2. Check for unauthorised repairs of electrical cabling or equipment. |   |   |   |
| 3. Check for any damage caused by heat, cut or crushing on electrical cabling. |   |   |   |
| 4. Check electrical cabling is not exposed at connection point on plug.  |   |   |   |
| 5. Check electrical cable connection to equipment body is not exposed. |   |   |   |
| 6. Check that the plug is not loose.  |   |   |   |
| 7. Check for exposed wiring and fraying or a deterioration of insulation coverings. |   |   |   |
| 8. Check for any damage/scorching to plug casing. |   |   |   |
| 9. Check equipment/appliance for damage, switches & buttons operate correctly and equipment/appliance is free from dust/dirt. |  |  |  |

**Important: Should you identify any issues with any of the kit provided you should immediately stop using it and report it to the Facilities team via this form, returning to the following address** PHW.Facilities@wales.nhs.uk **so that arrangements can be made to replace equipment as necessary.**