Electrical Standard Operational Manual

(SHEMS-STD-GR-071)

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1 Introduction

The Electrical Compliance Standard is based on the general principles of sound electrical safety management and is intended to form the basis of Unitas policy, towards compliance with all relevant statutory regulations, current standards and best practice.

This Standard does not claim to be exhaustive, and any matters that require clarification are to be raised with the appropriate electrical manager or supervisor.

Unitas believes that the guidance and information contained in this document is correct, but all parties must rely on their own skill and judgement when making use of it.

1.1 Amendment Record

AMENDMENT NUMBER / DATE	PROCEDURE(S) AFFECTED	SUMMARY OF CHANGES
First Issue May 2011	---	Issue of all procedures as listed on the contents page dated May 2011. These procedures supersede earlier versions.
Re-Issue November 2012		Total review following changes in BS 7671, BS 5266 and Building Regulations
Re Issue June 2013		Submission to the board for approval after further significant reviews.
Re Issue June 2014		Review of formats, qualifications and gas electrical compliance interface.
Re-issue July 2015		Review of definitions due to BS 7671 Amendment 3
Re-issue July 2017		Inclusion of Electrical Scorecard Reporting Section 6.1.

2 Scope

The scope of the SHEMS covers all persons, workplaces and operations.

This compliance manual encompasses both the domestic and commercial ranges of electrical work activities that are carried out within the UK on low voltage systems up to 1000V a.c. and 600V d.c.

The manual is not intended to instruct untrained and/or inexperienced persons to undertake work, in relation to electrical installations. It assumes that all persons proposing to undertake such work have the necessary competence, and are properly equipped, to undertake such work without putting themselves, others or property at risk.

It is intended to assist managers, site managers and supervisors to comply with statutory regulations, current standards and best practice and is to be read in conjunction with SHEMS and the appropriate electrical risk assessments, method statements and safe systems of work.

3 Unitas Requirements

3.1 Roles and Responsibility

3.1.1 NICEIC (or Equivalent), Registered Principal Duty Holder

This is the person(s) appointed by the who has responsibility to maintain the overall standard and quality of the electrical installation work, undertaken by the business and must be:

- Responsible for all matters relating to enrolment and communication with the NICEIC (or equivalent).
- A full-time Electrical Qualified and Competent manager of the business having an understanding of, and responsibility for, the health and safety and other legal requirements, relating to the range of electrical work under taken by the business.
- Responsible for the assignment of electrical work to the Qualified Supervisor(s)
- Responsible for ensuring that all work undertaken or arranged is carried out by skilled persons, who are adequately and appropriately supervised.
- Responsible for ensuring that the appropriate certificates and reports are issued, for all completed electrical work.

3.1.2 Qualified Supervisor

This is an electrically skilled person with specific responsibility, on a day to day basis, for the safety, technical standard and quality of electrical installation work under their control.

The accredited body (e.g. NICEIC / ECA / ELECSA) Qualified Supervisor is also responsible for:

- Ensuring that the results of inspection and testing of electrical work are recorded correctly on the appropriate certification or reports.
- Ensuring that the business premises equipment, documentation and records are available for inspection when required.
- Safeguarding all unused accredited body forms of certification and reporting against loss, theft and misuse.

3.1.3 Appointed Electrical Duty Holder

Unitas Business appointed Qualified Supervisor who takes responsibility for ensuring electrical equipment is in good order and testing and certification is carried out by an electrically skilled person.

Unitas Form Appointment of Electrical Authorising Engineer

Project Title:	Project Number:

In accordance with the Unitas Safety, Health and Environmental (SHE) Management System, and the Unitas Electrical Compliance Management Standard the following person is hereby appointed as Electrical Authorising Engineer:

Name:

The appointed Electrical Authorising Engineer will carry out the following duties:

1. Compile a register of all the electrical equipment which is used at…….
2. Make arrangements for all new electrical installation work to be inspected, tested and certified by a competent person prior to handover or putting into service.
3. Ensure that all equipment, particularly switchgear and fuseboards, are clearly labelled for circuit identification purposes.
4. Ensure that all electrical systems, portable electrical appliances / tools are periodically inspected by a competent person and/or tested to ensure that they are fully serviceable and appropriate records are kept.
5. Investigate and support SHE in any Electrical Incidents.
6. Ensure that all employees, agency and Sub-Contractors are suitably qualified and competent.
7. Ensure a robust monitoring and auditing system is implemented.
8. Manage any Electrical Permit requirements through a complete business stream structure.

If you require any advice to enable you to fulfil your duties, please contact the Unitas Health and Safety Advisor.

Signed: ……..…… Electrical Authorised Engineer	Date:
Signed: ……. Electrical Manager Print	Date:
Signed: ……. SHE Director/Senior Manager Print	Date:

3.2 Competency and Skilled

Any individual working for, or on behalf of Unitas (hereafter called operative) must be able to demonstrate they are competent and skilled to undertake the work given to them, be able to identify unsafe conditions and safeguard persons, livestock and property, against danger and damage.

3.2.1 Duty of Care

The EAWR states that it shall be the duty of every employer and self-employed person to comply with the provision of the regulations, in so far as they relate to matters which are within their control. It shall be the duty of every employee while at work, to cooperate to enable the duty placed on an employer by the regulations to be complied with. And also to comply with all the regulations relating to matters which are within their control.

It is the responsibility of anyone carrying out electrical work for, or on behalf of Unitas, in the role as an electrically skilled person, to ensure that they complete their work, in accordance with statutory regulations, current standards and best practice.

Sub-contractors carrying out electrical work for and/ or on behalf of Unitas must be registered with the NICEIC and be electrically skilled for the work that they undertake. Sub-contractors carrying out domestic electrical work for and/ or on behalf of Unitas must be registered with a government approved body (e.g. NICEIC , ELECSA, NAPIT etc.) and be electrically skilled for the work that they undertake within Unitas.

Operatives must always follow their trade safety information, specific task risk assessments, method statements and safe systems of work.

NB: Although BS 7671 is non-statutory, it may, however, be used in a court of law in evidence to claim compliance with a statutory requirement e.g. EAWR 1989. Installations which conform to the standards laid down in the current edition of BS 7671 are regarded by the HSE as likely to achieve conformity with the relevant parts of the EAWR 1989. It cannot be guaranteed that BS 7671 complies with all relevant regulations and it must be stressed that it is essential to establish what statutory and other regulations apply and to undertake work accordingly.

3.2.2 Skilled Person

The Electricity at Work Regulations place responsibilities on employers to employ competent and skilled individuals, having sufficient technical knowledge, practical skill, experience, ability and training for the nature of the work being undertaken, whether it be direct employed or self-employed operatives.

The operative must have the ability to recognise their own limitations and take appropriate action to prevent harm to those at work, or those who may be affected by their work.

It is essential that operatives are able to identify electrical installations and/or equipment which may present a danger and act accordingly, to prevent danger to property and injury to them-selves and others.

3.2.3 Ensuring Competency

Knowledge must be kept up- to-date with awareness of changes in law, technology and safe working practices.

Electrical certification shall be checked by a NICEIC registered Qualified Supervisor, to verify competence and compliance. Once checked the certification shall be permanently stored.

Quality checks/evaluations are a prime tool in measuring standards and shall be undertaken on all operatives and works completed.

Checks on electrical work and electrical operatives, will be undertaken both in progress and by post inspection, on a sample basis. The checks will be carried out by the Qualified Supervisor. In some cases this may be done jointly with the client where required.

3.2.4 Training

Managers must ensure that employees under their control have the necessary training to carry out their duties in line with SHEMS.

When required, training shall be delivered in line with SHEMS and where appropriate, under an accredited scheme or by an accredited training provider.

Records of training and qualifications must be recorded, retained and kept up to date.

Tool Box Talks (TBT's) may be proactive or reactive and shall be delivered in line with SHEMS by managers or supervisors and, as appropriate, including sub-contractors. The frequency of delivery must be identified and reflect the level of risk, with records being retained in the SHE file and/or with the training manager/SHEMS.

3.2.5 Guidance for Recruitment & Selection of Electrical Operatives

The recruitment and selection of electrical operatives shall be carried out in line with SHEMS and local HR procedures. Operatives must be able to demonstrate competency for the work undertaken.

3.2.6 Qualification Requirements

Qualifications must ensure that an individual has enough knowledge, practical skills and experience, to complete all aspects of work safely.

Trade qualifications need to be verified by the appropriate accredited training body (EAL or City & Guilds) to demonstrate competency. Equivalent qualifications for none UK operatives must be discussed and agreed with the Electrical Manager.

It is also a requirement that unless a waiver is sanctioned by a director, all electrical sub-contractor operatives hold a card issued by an accredited competency scheme. Such as the Construction Skills Certification Scheme (CSCS) or Electro-technical Certification Scheme (ECS), with the latter being the preferred option.

3.2.7 Selection of Sub-Contractors

The procurement of products and services shall be carried out in line with SHEMS, which would require sub-contractors being vetted by the Electrical Team through the procurement process.

Before being accepted through this process, sub-contractors must undergo a pre-qualification process, to demonstrate their capability at a business level, through assessment of their safety, health and environmental competence.

The selection of sub-contractors must consider relevant aspects of the activities to be undertaken including the complexity of the work, resources, supervision, previous similar work undertaken, performance, etc. before they are appointed or selected to carry out work.

The sub-contractor shall supply sample risk assessments and safe systems of work, Certificates, Training matrix which must be checked and accepted by an electrically skilled person (Can be externally verified or from within the group).

3.2.8 Sub-Contractor Office and Site checks

Random office checks shall be carried out by a Unitas Electrical Manager or Qualified Supervisor, to confirm they have in place the following records or documentation and where appropriate they are current:

- Registration to an accredited body (e.g. NAPIT/ NICEIC/ELECSA)
- Qualified Supervisor approval details.
- Qualifications of all operatives working on Unitas contracts should be in line with minimum standards.
- Records of quality assurance and quality evaluations.
- CSCS or ECS card.
- Sample risk assessments and safe systems of work
- Certification appropriate to the work being carried out

Random site "in progress" and "post inspection" checks shall be carried out by a Electrical Manager, or Qualified Supervisor to confirm health and safety on site, quality of work and certification are satisfactory.

All records shall be retained by a Unitas local person responsible for electrical compliance.

3.3 Competent Persons Scheme

Some building regulations have a requirement to notify controlled works to Building Control. This can be achieved by using Competent Persons Schemes. The relevant parts of the building regulations that are applicable to electrical works are:

- Part A Structure
- Part B Fire Safety
- Part E Resistance to the passage of sound
- Part F Ventilation
- Part L Conservation of fuel and power in dwellings
- Part M Access to and use of buildings
- Part P Electrical Safety

All of the parts above relate to electrical works, but Part P is particularly relevant since electrical installers, carrying out work in dwellings and communal areas, must comply with Part P of the Building Regulations.

Members of an accredited body (NICEIC for example) are able to self-certify the electrical work, without informing Building Control before undertaking the work.

3.3.1 Government Approved Organisations

The following organisations are approved by the Government in England and Wales, to register electricians to enable them to carry out domestic electrical installation work, which meet the requirements of Part P.

- NICEIC National Inspection Council for Electrical Installation Contracting
- ELECSA Subsidiary of the Electrical Contractors' Association
- NAPIT National Association of Professional Inspectors and Tester
- STORMA
- BESCA Building Engineering Services Competence Assessment
- Benchmark Certification

NB 1: It is preferred to use a Certsure branded organisation
NB 2: Client agreement must be sought where an organisation other than NICEIC is considered

3.3.2 Certsure

The Electrical Safety First (**ESF**), the Electrical Contractors Association (**ECA**) and Certsure created a partnership to operate the **NICEIC** and **ELECSA** brands and certification.

The ECA and the ESF have historically worked closely with government and key national bodies, to improve industry standards and procedures.

The joint venture was created in response to feedback from members, stakeholders, customers and the government. All of whom wanted to see a more clearly defined synergy, between the key players in the electrical industry.

The joint venture has created an Electrical Safety Register: www.electricalsafetyregister.com, which is a searchable database of registered contractors, promoted to hundreds of thousands of consumers and specifiers.

3.3.3 National Inspection Council for Electrical Installation Contracting (NICEIC)

NICEIC is the electrical contracting industry's independent voluntary body, for electrical installation matters throughout the UK. They offer industry-leading certification services, Building Regulations Schemes, products and support, to electrical contractors and many other trades within the construction industry.

The NICEIC also helps to protect householders and consumers from the dangers of unsafe and unsound electrical installations. They also provide advice on the dangers of electricity and building regulations.

NICEIC also operates a suite of schemes (approved contractor, domestic installer, green deal etc.) to enable householders, landlords and other buyers of contracting services, to find reputable contractors that are registered to certify their work to the relevant Building Regulations.

3.3.4 Electrical Contractor Association (ECA)

The Electrical Contractors' Association (ECA) is the UK's leading trade association representing the interests of contractors, who design, install, inspect, test and maintain electrical and electronic equipment and services.

The Electrical Contractors' Association is the UK's largest and leading trade association, representing electrical, electronic, installation engineering and building services companies. Recognised by government, commerce and industry as the authoritative voice of the sector, the ECA is among the nation's best resourced representative associations.

The Association works closely with government and key national bodies, to improve industry standards and procedures. Its comprehensive, progressive and innovative services are highly respected and renowned throughout the industry.

3.3.5 Competent Persons Scheme

Electrical compliance with the Building Regulations in England and Wales, is governed by the Communities and Local Government (CLG) and in Scotland by the Scottish Building Standards (SBS), to ensure compliance by using a member of an accredited body.

The Building Regulations apply to building work in England and Wales and set standards for the design and construction of buildings, to ensure the health and safety of people in or about those buildings. Equivalent Regulations apply in Scotland, under the Building (Scotland) Act.

The requirements of Part P apply only to electrical installations that are intended to operate at low or extra-low voltage and are:

- In a dwelling.
- In the common parts of a building serving one or more dwellings, but excluding power supply to lifts.
- In a building that receives its electricity from a source located within or shared with a dwelling.

- In a garden or in or on land associated with a building where the electricity is from a source located within or shared with a dwelling.

In line with SHEMS and Electrical Standard Operational Manual, approved sub-contractors must be registered with an accredited body and hold relevant qualifications. They must also hold specific training, to enable them to work on specific electrical systems and equipment.

3.3.6 Other Government Approved Scheme Organisations

There are other government approved scheme operators in England and Wales that register installers who carry out electrical work.

These schemes are designed primarily for those who do electrical installation work as an adjunct to, or in connection with their primary work activities, such as gas installations, plumbing, kitchen or bathroom fitting, heating installation work, security system work etc.

4 Operational Control

4.1 Safe working environment

All persons undertaking work, for or on behalf of Unitas must be able to assess the general work environment, based on their knowledge of the hazards that may be encountered. SHEMS provides the criteria for a standard framework documents.

4.1.1 Operatives Undertaking Work

To carry out work safely and effectively all operatives shall:

- Have appropriate test equipment to perform safe isolation and to conduct the necessary testing, relevant to the work being undertaken.
- Have a toolkit and van stock or access to materials that will enable them to undertake their work duties at all times.
- Where applicable ensure that mobile devices supplied by Unitas, are switched on at all times whilst working, unless there is an appropriate reason not to do so.
- Have relevant PPE and equipment, which must be carried, stored safely, and worn as appropriate at all times.
- Carry all relevant documentation and shall review and restock as necessary

Ensure that calibration and portable appliance testing of equipment (where necessary), shall be undertaken at the appropriate intervals, with an inventory kept of all tested equipment.

4.1.2 Safe Working Practice

To enable work to start and be completed safely by operatives, the following processes must be followed:

- Selection of skilled electrical operative
- Safety Induction
- Provision of specific training
- Provision of Trade Safety Information
- Provision of Task Risk Assessments (SHEMS-FOR-GR-070)
- Provision of Safe Systems of Work
- Toolbox talks
- Pre-start risk assessments by the electrical supervisor or dynamically by a skilled electrical person , i.e. person taking account of the 4 point check

It is the duty of the Electrical Manager, to ensure that this process is being followed.

Documentation such as Trade Safety Information, Task Risk Assessments, Safe Systems of Works, Procedures, and Toolbox Talks are available on SHEMS and are provided by the local teams to operatives under their control.

Managers and supervisors have to assure themselves that operatives understand these documents and are committed to following them.

These documents are generic and it must be understood that workplaces such as public buildings, social housing etc. will provide a widely differing range of risks.

Before work starts, each operative must carry out a Point of Work Pre-Assessment (SHEMS-FOR-DPS-170) to identify key risks in the property they are in.

Should it be determined that risks exist then work must not be started. The operative must report non-completion of the work to their supervisor. Re-assessment of the task must then be undertaken.

All operatives shall ensure that "Good Housekeeping" practice is observed in the workplace. This requires each operative to be familiar with the relevant aspects of these procedures, follow them accordingly and ensure that:

- All work is carried out in a safe manner, with due regard to their own safety and those that maybe affected by the consequences of their actions.
- All tools and other equipment are kept in good order, not subject to misuse and are not left lying around
- All areas are kept clean and tidy.
- Any hazard or near miss identified is reported to their immediate line supervisor or manager, in order for the appropriate corrective action to be taken.
- Any accident (however small), is reported in line with Unitas Incident and Unitas Reporting Standard.

4.1.3 Risk Management

Operatives must assess the general work environment, based on their knowledge of the hazards that may be encountered, with electrical installations and equipment, before undertaking any work.

Risks are to be identified and controlled by:

- Generic risk assessments
- Property specific risk assessments and method statements
- Task specific risk assessments and safe systems of work
- Unitas Minimum Standard

4.1.4 Working with Asbestos

Electrical operatives may come into contact with Asbestos Containing Materials (ACM) during their normal working duties refer to Asbestos Management standard SHEMS-STD-GR-041).

All operatives that work with ACM's must have up to date non-licensed training, follow the appropriate risk assessments and safe systems of work (including HSE Asbestos Essentials) and be familiar with the process of waste disposal.

The operatives must document their working with the records given, to the appropriate H&S team for analysis and monitoring.

Types of ACM's operatives are likely to encounter are:

- Artex
- Switchgear
- Asbestos Insulating Board
- Storage Heaters

Unitas Minimum Standards are also available to support such works.

4.1.5 Hazardous Waste Disposal

Particular care must be taken to ensure all hazardous waste is disposed of, in line with local arrangements.

Typical hazardous waste is:

- Fluorescent Tubes
- Batteries
- Smoke Detectors
- Polychlorinated Biphenyls (PCB)
- Mercury Switches

4.1.6 Temporary Supplies

All temporary supplies must meet the requirements of BS 7671 and in particular the requirements of section 704. Section 704 'Construction and Demolition Site Installations' applies to temporary installations for construction and demolition sites during the period of construction or demolition work including:

- Construction work on new buildings
- Repair, alteration, extension, demolition of existing or parts of existing buildings
- Engineering works
- Earthworks
- Works of a similar nature.

4.1.7 Avoiding the Danger from Underground Service

A safe system of work must be provided to avoid danger from underground services, which should include:

- Planning the work with the client
- Provision of plans from the client or service provider
- Use of cable and pipe locating devices by trained operatives
- Safe digging practices

Refer to Underground Service Standard (SHEMS-STD-GR-059)

NB: Training for use of the cable detector, must be thorough for any operator to be aware of its use and limitations. Devices must be used in line with manufacturers' instructions and should be regularly checked and maintained.

4.2 Signs and Notices

The Requirements for Electrical Installations (BS7671) provides examples of suitable model labels to be used when carrying out electrical works.

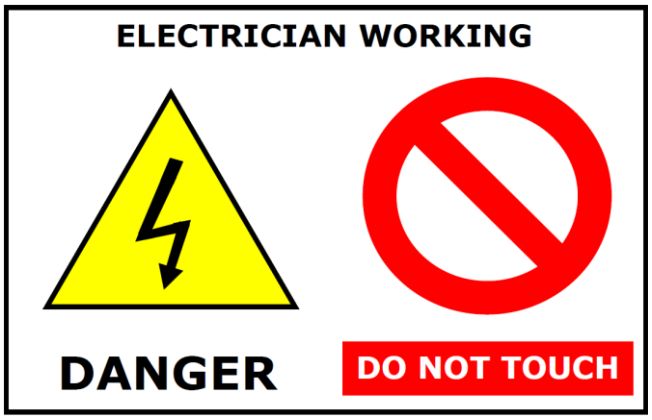
The person responsible for the work must ensure that the appropriate notices and/or signs are in place for the duration of the works and all labels are securely fixed on completion of the works.

4.2.1 Electrician Working Do Not Switch On Sign

A sign shall be fitted on the distribution board or switch where circuits have been isolated

4.2.2 Electrician Working Do Not Touch Sign

A sign shall be fitted on the distribution board or switch where circuits have been isolated or on equipment being worked on



4.2.3 Electrician at Work Caution Sign

A sign shall be fitted in the working area

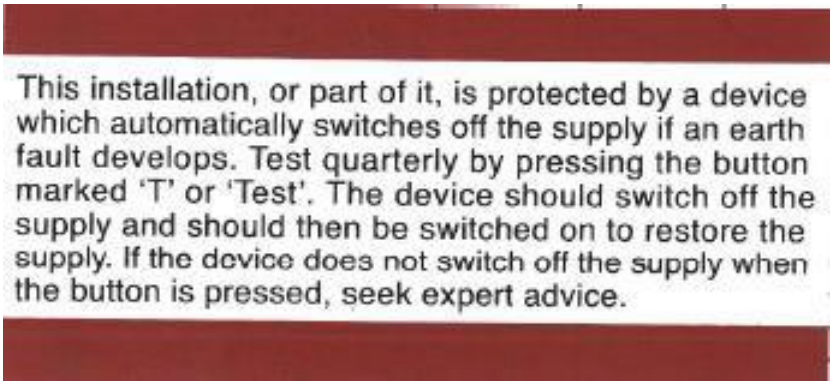
4.2.4 Periodic Inspection Notice

A label shall be fitted in a prominent position at or near the origin of the installation on completion of the periodic inspection

IMPORTANT
This installation should be periodically inspected and tested and a report on its condition obtained, as prescribed in the IEE Wiring Regulations BS 7671 Requirements for Electrical Installations.

4.2.5 RCD Notice

A label shall be fitted in a prominent position on each distribution board where RCD's or RCBO's are installed


This installation, or part of it, is protected by a device which automatically switches off the supply if an earth fault develops. Test quarterly by pressing the button marked 'T' or 'Test'. The device should switch off the supply and should then be switched on to restore the supply. If the device does not switch off the supply when the button is pressed, seek expert advice.

4.2.6 High Protective Conductor Current Notice

A label shall be fitted, listing all circuits likely to carry high protective current - such as IT circuits, in a prominent position on each distribution board where the circuits originate.

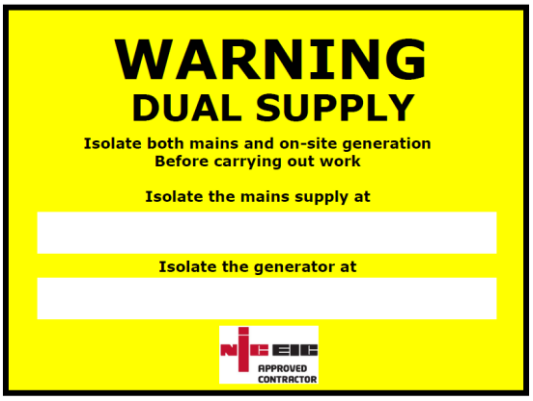
WARNING
High Protective Conductor Currents
The circuits identified below may have a high protective conductor current
Circuit No:
Modifications to these circuits must comply with the requirements of BS 7671: *Requirements for Electrical Installations* (as amended) including the supplementary requirements of Section 607: *Earthing requirements for the installation of equipment having high protective conductor currents.*
NICEIC

4.2.7 Wiring Colours to Two Versions of BS 7671 Notice

A label shall be fitted on in a prominent position on each distribution board where cables are coloured to different versions of the regulations.

4.2.8 Dual Supply Warning Label

A label shall be fitted in a prominent position at or near the origin of the installation where there is an additional source of supply such as a PV System or Generator.



4.2.9 Safety Electrical Earth Notice

A label shall be fitted in a visible position at or near to every point of earth connection

4.2.10 Non Earthed Lighting Circuit Notice

A label shall be fitted in a prominent position on the distribution board to identify where a lighting circuit does not have the provision for earthing metallic accessories.

4.2.11 Low Voltage Warning Notice

A label shall be fitted in a prominent position on the distribution board to identify where a lighting circuit does not have the provision for earthing metallic accessories.

4.2.12 Permit to Work Notice

NOTICE

ELECTRICAL PERMIT TO WORK

IN OPERATION

For Further Information
Contact Site Manager

_ _ _ _ _ _ _ _ _ _

On

_ _ _ _ _ _ _ _ _ _

For Emergencies Contact
Electrical Manager

_ _ _ _ _ _ _ _ _ _

On

_ _ _ _ _ _ _ _ _ _

4.3 Isolation

4.3.1 Isolation Legislation & Statutory Requirements.

Regulation 14 of the Electricity at Work Regulations (EAWR), states that no person shall be engaged in any work activity, on or near to any live conductor (other than one suitably covered with insulating material so as to prevent danger) that danger arises unless:

- It is unreasonable in all circumstances for it to be dead; and
- It is reasonable in all circumstance for the operative to be at work near it while it is live: and that
- Suitable precautions (including where necessary the provision of suitable PPE) are taken to prevent injury.

'Dead working' must be the normal method of working, to comply with regulation 14. But in certain cases 'Live working' is necessary and this should only be carried out in circumstances, where it is unreasonable to work dead.

NB: Unitas will only allow 'Live working' when carrying out testing and inspection work and some types of fault finding subject to Risk Assessment, Safe System of Work and approval.

Regulation 13 of the EAWR requires that adequate precautions must be taken to ensure that conductors and equipment, which have been made dead in order to prevent danger, cannot inadvertently be energised while the work is in progress (i.e. isolation).

Regulation 12 of the EAWR defines isolation to mean the disconnection and separation of the electrical equipment, from every source of electrical energy, in a secure manner. In most cases this will require securing the means of disconnection, by locking off, or permanent disconnection at the point of isolation.

Regulation 16 of the EAWR requires all electrical operatives involved in electrical works are competent, instructed on and trained in the implementation of safe systems of work.

4.3.2 Electrical Isolation minimum Standard

The Minimum Standard is a mandatory standard that all operatives must comply with and refers to safe isolation in void properties, hospitals, public buildings, schools, occupied domestic dwellings etc.

Electrical isolation must only be carried out by an electrically skilled person, who must have as a minimum qualifications to C&G 2382, when carrying out isolation work, and C&G 2394, when carrying out testing and commissioning work, or equivalent qualifications as agreed with the Electrical Manager.

NB: Where the same electrically skilled person carries out both functions, then they must be qualified to both C&G 2382 and C&G 2394, or equivalent.

4.3.3 Plan the Isolation Process

To provide safe isolation, an effective plan must take account of the following:

- Discuss arrangements with the building occupier or person, responsible for the safety of the electrical installation.
- Identify and understand the distribution system and the consequences of power down.
- Isolation to be carried out by an electrically skilled person, in line with the statutory requirements.
- Before works starts, select method of isolation - circuit is securely locked off or circuit conductors disconnected and made safe.
- NB: Where the earthing system is via an earth rod (TT), then the latter option must be adopted.
- Before re-energising circuits, ensure inspection, testing and certification is carried out.

- Where circuits are re-energised overnight, ensure inspection, testing, certification is carried out and earthling and bonding is in place. The Isolation process must be repeated when work is resumed.
- Where a permit to work is necessary, (where more than one electrical team is working in the same building) seek advice from the Electrical Manager or Qualified Supervisor.

NB: Where circuit conductors are disconnected, they must be made safe by insulating and labelling the cable ends and ensuring they are situated to prevent the possibility of inadvertent re-energisation.

4.3.4 Permit to Work

A permit to work is primarily a statement, to confirm that equipment is isolated and has been made safe to work on and is generally used where more than one electrical contractor is on the same site. The permit must not be used for live working, or issued for equipment that is still live, since this can cause confusion.

The permit (SHEMS-FOR-GR-016) states the description of work to be carried out, listing the exact equipment which has been made dead and its precise location. The information given in the permit must be precise, detailed, accurate and clearly state:-

- Precautions to be taken before commencement of work such as:
  a) warning notices
  b) circuits to be isolated and locked off
  c) Adequate earthing is provided
  d) Any other precaution

Only a designated electrically skilled person authorised in writing by the Electrical team can issue a permit-to-work, relating to specified equipment or systems. It is strongly advocated that the permit is issued at the place, where the work is being carried out.

The recipient of the Permit to Work becomes immediately responsible for ensuring all the specified safety precautions are adhered to and ensure that only the listed permitted work is carried out.

Where the person issuing the permit is also the recipient of the permit, it is strongly advised that another person makes an independent check of all precautions taken.

The permit is handed back to the designated electrically skilled person who originally issued it, for cancellation prior to the equipment being re-energised.

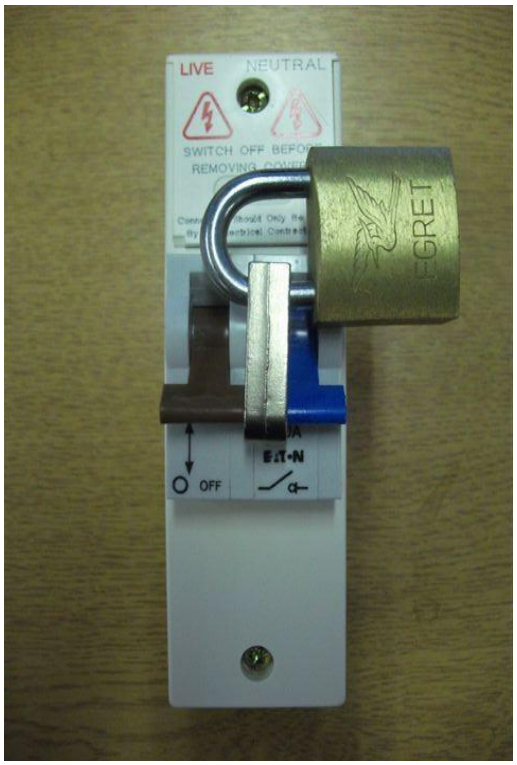
Monitoring should be carried out to ensure, that safety rules are completed accurately. It is preferable that monitoring is carried out by person(s) with managerial responsibilities and who is not involved in the day to day issuing of permits. The random audits should be on-going to ensure bad habits and inaccuracies, are identified and eliminated quickly.

NB: It is strongly advised that where a permit to work system is in place, then a suitable notice is placed in a prominent position.

4.3.5 Locking Off

Secure isolation can be provided by the use appropriate locking-off devices at the point(s) of isolation, accompanied by suitable labels or notices where necessary.

The padlock used with the appropriate locking-off clip, should only be removable by the use of a tool or by a unique key or combination, with the latter being the preferred option.



Single operative use

Multi operative use (Permit to Work)

Where lockable fuse inserts are not available, the following options may be considered:

- Fitting a conspicuously coloured dummy fuse carrier, without a fuse link to cover live part.
- Fitting a white blank fuse base with appropriate warning notice, to deter inadvertent replacement of a spare fuse.
- Locking the fuse board door or cover.

4.3.6 Utility Isolations

Some suppliers may provide and install suitable isolation, between the meter and the distribution board or consumer unit. This permits the supply to the installation, to be interrupted without withdrawing the distributor's cut-out fuse.

Prior to the commencement of any new installation works, which may include the renewal of a distribution board or consumer unit, an inspection will be necessary to verify that suitable isolation is in place, to allow isolation of the mains tails feeding the existing consumer unit.

Where suitable isolation is not in place, the work must not commence. For all types of workload, consideration must be given to the client, or client's representative, to instruct the relevant supply authority to fit an appropriate isolator. This is to ensure that there is a safe means of isolation, prior to the commencement of any work.

4.3.7 Emergency Isolation

Where there is an imminent risk of electrocution or fire, occurring in an existing distribution board or consumer unit. The operative shall switch off the main switch, where safe to do so and request the presence of the utility provider.

There is no exception for removing utility provider service cut-out fuses, other than persons nominated by the local supplier. Most utility providers will respond to an emergency within 3 hours and very often within the hour.

NB: It is a criminal offence to cut a utility provider's cut-out fuse seal and must not be allowed at any time. Unless a written license or permission, is given by the respective utility provider.

4.3.8 Isolation Procedure for a Skilled Operative

Isolation of circuit(s) must take account of the existing lighting arrangements, whereby stand-by lighting may be required.

Generally isolation will be carried out safely by following these steps in order:

1. Check that it is safe and acceptable, with the building occupier or user to isolate.
2. Identify and locate the equipment or circuit to be isolated.
3. Select a GS38 approved voltage indicating device and check its condition. Only use in conjunction with a proving unit or known voltage source. HSE Guidance does not allow the use of volt sticks or multi meters for isolation.
4. Confirm the correct function of the voltage indication device, against a known supply or proving unit.
5. Verify the equipment or circuit, is functional with the approved voltage indicator.
6. Positively locate and identify the correct isolation point. Where the earthing system is TT, this may be the main consumer unit isolation switch. This precaution is to ensure that all live conductors, including neutral are isolated.
7. Remove any loading to the equipment or circuit and isolate/switch 'off' the circuit to be worked on.
8. Ensure that all alternative energy sources (e.g. PV) are isolated.
9. Fit an appropriate locking-off device and 'lock off' (the person carrying out the works to retain the key). Where locking 'off' is not possible, disconnect the outgoing circuits and secure to prevent inadvertent contact with other live parts.
10. Where necessary fit appropriate warning notices. (Section 5.2)
11. Verify that no voltage is present, using the approved GS38 voltage indicating device.
12. Re-confirm the correct function of the voltage indicating device, on a known supply or proving unit

Equipment or circuit now safe to work on (where required complete and issue a 'Permit to Work').

After carrying out the work:

1. Complete a visual inspection and carry out dead tests, re-connecting circuit cables where applicable.
2. Remove 'lock off' device and warning notices and restore the electrical supply.
3. Complete live testing, commissioning and the appropriate test certificate or report.

4.3.9 Upgrading Heating Systems and Gas Appliance Controls

Electrical isolation must only be carried out by an electrically skilled person, who must have appropriate calibrated test equipment and follow the Low voltage electrical work, isolation & testing Minimum Standard and industry standard guidance on safe isolation and electrical testing. This process would require the circuit to be securely locked off, or circuit cables disconnected from the protective device.

On completion of the work, and before re-energisation, the essential tests must be carried out by an electrically skilled person with all test results recorded on appropriate certification. The certification shall be checked by a Qualified Supervisor and permanently stored.

Removal, replacement or isolation of electrical equipment, associated with domestic or commercial heating systems, must only be carried out after electrical isolation has been confirmed by an electrically skilled person.

Regular checking and monitoring must be carried out, to ensure that the isolation and lock off process is robust.

An exemption will be given where Gas/Plumbing Operatives carry out central heating component replacement work only (such as replacement pumps, valve and boiler parts etc.) providing they have achieved a current certificate in Electrical training, have been issued with proving units, Voltage testers and completed on site training.

Most modern gas appliances and central heating systems incorporate electrics and associated circuits.

For gas service engineers working on central heating systems repairs, and servicing, a level of electrical competence shall be demonstrated through a current Certificate of Electrical Training and limited to pump, valve and boiler (excluding circuit wiring):

Suitable electrical training courses for gas service engineers shall include the following minimum training requirements:

Basic Electrical Theory

- Ohms Law
- Circuit and conductor and termination types
- Protective measures
- Termination of cable and accessories

Safe Isolation and Health & Safety

- The Electricity at Work Regulations
- Voltage testing equipment types and compliance
- Safe isolation considerations
- Safe Systems of Work
- Practical safe isolation techniques explained and demonstrated

Basic Fault Finding

- Safe use of a multi-meter
- Questioning techniques

Commissioning, Inspection & Testing requirements

- Earth Fault Loop Impedance Testing
- Polarity testing
- RCD testing
- Recording test results

4.3.10 Replacement Pumps, Valves, Immersion Heaters etc.

Electrical isolation must only be carried out by an electrically skilled person, who must have appropriate calibrated test equipment and follow the Isolation Minimum Standard and industry standard guidance on safe isolation and electrical testing. This process may require the circuit to be securely locked off, or circuit cables disconnected from the protective device.

On completion of the work, and before re-energisation, the essential tests must be carried out by an electrically skilled person, with all test results recorded on appropriate certification. The certification shall be checked by a Qualified Supervisor and permanently stored.

4.3.11 Trades Working Near To Electrical Accessories

Where other trades such as plasterers and tillers have to work near to electrical accessories they must ensure the supply is isolated by an electrically skilled person and a Trade Permit to Work Around Electrics must be issued.

An option where this is impracticable (e.g. plastering and tiling where the accessory has to be left energised) then a temporary box (e.g. Yoozybox) must be fitted. When plastering and/or tiling, the Yoozybox must be installed and removed by an electrically skilled person, with testing being completed on install and removal.

Yoozybox shown between back box and socket outlet.

4.3.12 Cleaning Near To Electrical Accessories

Where cleaning would result in electrical accessories being subject to water splashes, then the circuit(s) must be switched off by an electrically skilled operative.

4.3.13 Use of Test Equipment

Test equipment and leads must be selected in accordance with GS38, which offers advice in the selection and use of measuring equipment.

Training in the correct use of voltage detectors, is essential to avoid risk, in the event of unexpected use on a live conductor.

All test equipment must receive regular checks and inspection, by a competent person. Inspection results must be recorded and retained.

Two-pole voltage detectors, proprietary test lamps with insulated probes and fused test leads, should be used for detecting high energy sources (e.g. 230V). These devices must be proved before and after use on a known live source, of similar voltage to the circuit under test.

NB: The use of multi-meters, which can be set to the wrong function, is not recommended for proving a circuit is dead and should only be used for fault finding on extra low voltage (not exceeding 50V ac or 120V dc) equipment.

5 Test and Certification

Inspection, Testing and Certification should be carried out in line with the BS 7671, in conjunction with IET Guidance Note 3 and other relevant statutory regulations.

BS 7671 provides the criteria and outlines the necessary testing to confirm every new installation meets the requirements of BS7671 and every installation currently in use is in a satisfactory condition for continued service. Appropriate certification must be completed for the type of work undertaken.

IET Guidance Note 3 provides further information, of how to carry out the inspection and testing. An in depth inspection checklist is provided with references to the appropriate regulations, the sequence of testing and the relevant test methods.

5.1 Inspection and Testing

All electrical work carried out must be inspected, tested and recorded (the exception being where no electrical termination has been disturbed, such as lamp replacement) to ensure that the work undertaken does not impair the safety of the existing installation.

The purpose is to check that the electrical installation meets the requirements of BS7671 and any other applicable standards, is properly constructed and only incorporates equipment which has been correctly selected for its intended purpose.

While the 'Electricity at Work regulations 1989' does not specifically require electrical installation certificates or reports to be issued and retained, such documents may provide the only effective evidence for the person(s) responsible for the safety of an electrical installation should they be prosecuted under the provisions of those statutory regulations.

5.2 Certification

BS 7671 provides examples of model forms to be used for certification and reporting of electrical works. Other British Standards also provide examples of model certificates, for use for carrying out more specialised electrical works.

It is preferred that certification provided by the NICEIC is used, which will allow standardisation across the business. This does not preclude the use of certification from other approved bodies, such as ECA, or certification produced from recognised software such as Amtech or, where agreed with a Unitas Services Electrical Manager, in-house certification providing they are in line with the model forms listed in BS 7671.

Where NICEIC certification is provided, for approved contractors the certificate colour should be red and for Domestic Installers the certificate should be purple. Green coloured NICEIC certificates indicate the contractor is not registered and acceptance of these certificates must be agreed with a Unitas Services Electrical Manager.

5.3 Calibration of Test Instrumentation

Test instrumentation should be subjected to regular checks and accuracy and should be verified using a proprietary instrument 'check box' or through an external instrument calibration provider.

5.4 Frequency of Inspection

Recommended frequency of inspection is given in the Institute of Electrical Technology (IET), formally IEE, Guidance Note 3 (Inspection and Testing) with the ESF Landlords Guide giving additional electrical safety advice in rented accommodation. Unitas current policy is to carry out a full test of rented accommodation at a minimum of every five years or every tenancy change (whichever comes first) unless clearly instructed otherwise, in writing by the client.

5.5 Types of Condition (Periodic) Reports

These reports are intended for use when reporting on the condition of an existing installation and to report on any factors that may impair the safety of an electrical installation.
Limitations to testing may be agreed with the client team, as long as an instruction is provided in writing by the client team.
If such an agreement takes place, the client must be made fully aware of the risk and their liabilities.

Typically reasons for carrying out reports are:

i. Change of tenancy
ii. Mutual exchange
iii. Change of use
iv. Following fire or flood
v. At the end of recommended period of previous report/certificate

- **Domestic Visual Condition Report**
  The report cannot confirm that the installation is safe for continued use and should only be used where the client is made aware of its limitations
- **Domestic Electrical Installation Condition Report**
  Used for reporting the condition of an existing domestic property
- **Electrical Installation Condition Report**
  Used for reporting the condition of an existing property
- **Leisure Accommodation Vehicle Electrical Installation Condition Report**
  Typical installations include touring caravans, motor homes or a caravan holiday home
- **Highway Electrical Installation Condition Report**
  Typical installations include street lighting, bollards, road signs, telephone kiosks, bus shelters.
- **Transportable Building Electrical Installation Condition Report**
  Typical installations include welfare units, workshop units, catering units, medical or health screening units
- **Filling Station Electrical Periodic Inspection Report**
  The Approved Contractor must have been assessed as having the technical capability to carry out work in compliance with the Association of Petroleum and Explosives Administration (APEA) and the Energy Institute (EI).

5.6 Types of Electrical Installation Certificates

Every new electrical installation and every alteration or addition to an existing installation must be thoroughly inspected and tested, before the installation, addition or alteration, is put into service.

Verification includes inspection and testing both during construction and on completion of the work, with comparisons of the results compared with the requirements of BS 7671 and the design information.

NB: The certificates cannot be used when verifying third party work. In these cases an appropriate electrical installation condition report must be used.

- **Minor Electrical Installation Works Certificate**
  Used only for an addition or an alteration to a single circuit that does not extend to the provision of a new circuit.
- **Domestic Electrical Installation Certificate**
  Used for domestic properties for all new installation work and for all additions or alterations, to existing installations.
- **Electrical Installation Certificate**
  Used for all new installation work and for all additions or alterations, to existing installations.

- **Electrical Installation Certificate for PV Systems**
  Used for all new domestic small-scale photovoltaic installations.
  Installers must be MCS approved (see Green Deal Manual for further information)
- **Leisure Accommodation Vehicle Electrical Installation Certificate**
  Typical installations include touring caravans, motor homes, or a caravan holiday home.
- **Modular Dwelling Electrical Installation Certificate**
  Used where the dwelling is a factory-constructed and partially factory-assembled modular building, and
- **Highway Electrical Installation Certificate**
  Typical installations include street lighting, bollards, road signs, telephone kiosks, bus shelters.
- **Transportable Building Electrical Installation Certificate**
  Typical installations include welfare units, workshop units, catering units, medical or health screening units
- **Filling Station Electrical Completion Certificate**
  The Approved Contractor must have been assessed as having the technical capability, to carry out work in compliance with the Association of Petroleum and Explosives Administration (APEA) and the Energy Institute (EI).
- **Filling Station Inventory of Electrical Equipment**
  This inventory is for a new or newly refurbished filling station and should be issued with the initial Filling Station Electrical Completion Certificate

5.7 Types of Emergency Lighting Certification

- **Emergency Lighting Completion Certificate**
  Consists of 4 declaration forms that confirm the system complies with the recommendations and requirements of BS 5266
  Form 1: Completion Certificate
  Form 2: Design Declaration
  Form 3: Installation Declaration
  Form4: Verification Declaration

- **Emergency Lighting Periodic Inspection and Testing Certificate**
  Used when reporting on the condition of an existing installation and to report on any factors, that may impair the safety of an electrical installation.

5.8 Types of Fire Detection and Alarm System Certification

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- **Fire Detection and Alarm System Installation Certificate**
  Used for certifying that the installation has been installed in accordance with BS 5839-1.
- **Fire Detection and Alarm System Design Certificate**
  Used for certifying that the installation has been designed in accordance with BS 5839-1.
- **Fire Detection and Alarm System Commissioning Certificates**
  Used for certifying that the installation has been commissioned in accordance with BS 5839-1.
- **Fire Detection and Alarm System Acceptance Certificates**
  Used for the formal acceptance and hand over to the clients nominated, competent person.
- **Fire Detection and Alarm System Verification Certificates**
  Used for verifying that the work complies with, and has been commissioned, in accordance with BS5839-1.
- **Fire Detection and Alarm System Inspection and Servicing Report**
  Used to confirm that the system has been inspected and/or serviced, in accordance with BS5839-1
- **Fire Detection and Alarm System Modification Certificate**
  Used to confirm that the system has been modified, in accordance with BS5839-1

- **Certificate of Design, Installation and Commissioning of a Fire Detection and Alarm System of Grade B, C, D, E or F in a Dwelling**
  Used for certifying that the new installation, in a dwelling (house or single flat) is installed in accordance with BS 5839-6.

5.9 Electrical Danger Notification

This form should only be issued by an Approved Contractor or Domestic Installer. It is used where an immediate dangerous condition has been identified and which cannot be rectified immediately. This may be due to contractual arrangements, or the tenant/building user refusing to disconnect unsafe electrical cabling and equipment.

No circuit will be re-energised, unless the subsequent inspection and test is recorded and confirms it is safe to do so.

This procedure must be followed to discharge the duty imposed on competent persons by Regulations 4(1) and 4(2) of the Electricity at Work Regulation, and also provide a record of the advice, given to remedy the deficiency as a matter of urgency.

5.10 Types of Building Notification Compliance Certificates

- **Electrical Installation Work Certificate of Compliance**
  Domestic Installers must notify NICEIC (or approved body) within 25 days of completing Notifiable work, to allow them to issue a Building Regulations Compliance Certificate, to the customer within 30 days.
- **Scottish Building Services Certification**
  Building standards require certification for construction, from approved certifies such as NICEIC or SELECT. On completion of work, the certificate is sent to the local authority to verify.

5.11 In-House Certification

- **Minor Electrical Installation Works Certificate**
  Used for addition(s) or alteration(s) for to up to four circuits and does not extend to the provision of a new circuit.
- **Non-Notifiable Repair Certificate**
  Used for responsive type repair work, where the renewal is on a like for like basis and does not require Building Control notification.

NB: Both certificates are available electronically, when using mobile devices

5.12 End User Information

Information regarding all aspects of the electrical installation must be left with the end user on completion of the works. The information can vary from a user instruction reference sheet, in smaller installations such as a domestic dwelling to a user operational manual incorporating H&S information, plans, as fitted drawings, disposal of end of life waste etc. for larger commercial installations. It is important to provide the user with information to allow them to safely carry out checks and maintenance, on all electrical equipment including:

- Testing and resetting RCD's
- Operating time clocks and thermostats
- Testing fire and CO detection
- Operation of ventilation system
- Operation of shower units
- Operation of Intruder Alarm

6 Quality Assurance and Storing of Certification and Reports

Accredited bodies, such as NICEIC or ECF, include guidance with all types of certification and reports. Although this information allows the reader to ensure that the documentation is completed in a professional manner. Some form of electrical check is required to verify that the electrical data, complies with current regulations. The standardised and agreed checks and measures below will be utilised for QA.

An appropriate Qualified Supervisor (experienced with the work certified) must have access to 100% of the certificates or reports, generated by sub- contractors to confirm their acceptability. This access should be incorporated into regular QA checks as part of random site visits. Where individual Client requirements specify a greater frequency or monitoring rate these shall be adopted. The Qualified Supervisor (QS) will ensure that the results of inspection and testing are recorded correctly on the appropriate certificates and forms and will safeguard any documentation. Internally delivered works require a 100% review of certificates and work forms. This will also include QA checks of one per month per operative, as random site visits, sampling all work types and any minor repair works certificates.

All completed certificates or reports must be stored safely, either as paper copies, or electronically by the person ordering the work, with a further copy stored safely, in either manner by Unitas. Records of monitoring will be retained locally to identify the levels of control, the outcomes of inspection and any actions taken.

As with the field audit any non-conformance identified with desktop audit must be recorded on the non-conformance form.

6.1 Electrical Compliance Scorecard & Technical Compliance Audit

Electrical management audits will be conducted by the Electrical Manager and individual Qualifying Supervisors using the Electrical Compliance Scorecard - Electrical (SHEMS-FOR-GR-415)

The ECS is designed to identify the electrical management performance of each contract and report the findings back to the Head of Business Assurance. Any non-compliant areas identified will then be subject to appropriate improvement measures to reduce any business or safety risk. The ECS is harmonised with some of the key requirements of registration with NICEIC.

Any contract or site overseeing, managing and controlling electrical work shall have the ECS review process in place. The ECS audit will be conducted at contract commencement and thereafter on a monthly basis.

When a third party sub-contractor is employed to undertake electrical work on behalf of Unitas the relevant contract manager or responsible person shall ensure that each sub-contractor business has been suitably assessed to deliver the scope of work and the results shall be recorded on ECS.

Where electrical work is being delivered by Unitas and the Contract/Site Manager is not electrically competent or experienced, the responsible Manager shall assign the completion of the ECS to a suitably competent Electrical Manager, or QS.

A minimum of 1 completed ECS will be submitted for each contract controlling Electrical work. These will be submitted to the Electrical Manager by the end of each month. The results will be recorded on the Monthly returns register and reported to the Unitas Board.

7 Electrical Sub-Contractor Management

Where a Sub-contractor is undertaking electrical work on behalf of Unitas, the Allocated Electrical QS must have available evidence of on-going monitoring. This shall include quality control audits and a review of the systems that the Sub-contractor undertake as part of their role as an NICEIC registered contractor.

All elements of section 6 shall be relevant when managing sub-contractors.

Evidence of on-going monitoring shall be retained at Contract/Site level.

Where the overseeing Manager is not suitably qualified/experienced

Where Unitas is the principle contractor Unitas has a responsibility to check appointed sub-contractor competency. Regulations can be found within the Construction Design and Management Standard SHEMS-STD-GR-025 (LINK).

When the appointed Unitas Manager is not electrically experienced or qualified then a Unitas QS will be appointed.

8 Technical Guidance

A clear path must be established to enable all employees to have access to an electrically qualified person. All electrical operatives must be supervised by an electrical QS, issue appropriate information and technical support.

8.1 Technical Library

Each business hub should have as a minimum, access to the current versions of the following list of technical information:

- Memorandum of Guidance on the Electricity at Work Regulations
- Requirements for Electrical Installations (BS 7671)
- Building Regulations (Parts A, B, E, F, L, M, and P)
- Electricity at Work Safe Working Practices (HSG85)
- Avoiding Danger from Underground Services (HSG47)
- Avoidance of Danger from Overhead Electrical Power Lines (GS6)
- Electrical test equipment for use by electricians (GS38)
- Emergency Lighting (BS 5266 – Parts 1, 7 and 8)
- Fire Detection and Fire Alarm Systems (BS5839 – Parts 1 and 6)
- Code of Practice for In-service Inspection & Testing of Electrical Equipment
- IEE Electrical Maintenance 2nd Edition
- IEE Guidance Notes (1-8)
- IEE On Site Guide
- IEE Electricians & Designer Guide to Calculations
- IEE Electricians Guide to the Building Regulations
- IEE Electricians Guide to Emergency Lighting
- NICEIC Snags & Solutions (Parts 1-3)
- NICEIC From The Helpline
- NICEIC Guide to Completing Specialised Certificates & Reports
- NICEIC Site Guide for Domestic Electrical Installation
- NICEIC Inspection Testing & Certification
- NICEIC Domestic Periodic Inspection Testing & Reporting Guide
- NICEIC Domestic Electrical Installation Condition Report DVD
- NICEIC Pocket Guides
- BSI Guide to BS5839 Part 1:as amended
- BSI Guide to BS5839 part 6:as amended
- BSI Guide to Emergency Lighting
- The Essential Guide to the Wiring Regulations

- ESF Best Practice Guides
- Health Technical Memorandum 06-02: Electrical safety guidance
- For low voltage systems

8.2 Operatives Recommended Guides

Qualified Supervisors must give access to appropriate site guides that are relevant to the scope of work being undertaken.

- ESF Best Practice Guides
- NICEIC Pocket Guides
- NICEIC Site Guide for Electrical Installations
- On-Site Guide (BS7671:as amended)
- NICEIC Inspection Testing & Certification (including periodic reporting)
- IET Electricians Guide to the Building Regulations

Note: This is not an exhaustive list and additional site guides are available covering wider scopes of work.