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ELECTRICAL SAFETY POLICY

Guidance on the management of electrical safety and safe isolation procedures for low voltage installations

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Like all MW Fire Ltd policies, this is a living document that is reviewed annually, usually in January, for relevance and currency against the latest industry guidelines, best practices, regulations, and applicable legislation concerning electrical safety in the workplace.



1. Policy Statement

It is the policy of MW Fire Ltd to ensure that all electrical equipment, including fire alarm panels, control equipment, and testing instruments, complies with the relevant statutory and industry standards, and is inspected, maintained, and operated in a manner that controls risks to health and safety.

All employees, subcontractors, and, where appropriate, other trades, site visitors, and members of the public who may be in close proximity to electrical equipment being worked on will be instructed and trained to a level appropriate to their involvement.

2. Scope and Definitions

As a specialist fire protection company, MW Fire Ltd designs, supplies, installs, commissions, and services fire alarm systems. These life safety systems operate at Extra Low Voltage (ELV), meaning below 50 volts AC. As a result, engineers, installation operatives, and subcontractors do not normally work with Low Voltage (LV) systems, defined as 50 volts up to 1,000 volts AC.

The connection between the mains supply and the fire system is made at the distribution board, where a single-phase radial feed (230V) is taken to a fused connection unit (FCU), commonly referred to as a spur, typically located within one metre of the fire panel. The supply circuit at the distribution board may incorporate additional protective devices such as a Residual Current Device (RCD), an RCBO, or a Surge Protection Device (SPD).

MW Fire Ltd operatives work on the ELV side of the installation. However, there are circumstances in which they may be required to install the supply circuit and spur, and this policy therefore also addresses electrical safety and safe isolation on the LV side. All requirements in this policy apply equally to ELV work; the fact that ELV carries a lower inherent risk does not remove the obligation to follow safe systems of work.

2.1 Voltage Definitions

Extra Low Voltage (ELV): below 50V AC rms or below 120V DC ripple-free.

Low Voltage (LV): up to 1,000V AC rms or up to 1,500V DC ripple-free. Single phase: 230V line to neutral or line to earth. Three phase: 400V phase to phase.

2.2 Abbreviations

- DB – Distribution Board
- ELV – Extra Low Voltage
- FCU – Fused Connection Unit
- HSE – Health and Safety Executive
- HV – High Voltage
- LV – Low Voltage
- RCBO – Residual Current Breaker with Overcurrent protection
- RCD – Residual Current Device
- SPD – Surge Protection Device
- WEEE – Waste Electrical and Electronic Equipment

2.3 Legislation and References

This policy is underpinned by the following legislation and guidance:

- Health and Safety at Work etc. Act 1974
- Electricity at Work Regulations 1989
- Management of Health and Safety at Work Regulations 1999
- BS 7671:2018 – Requirements for Electrical Installations (IET Wiring Regulations)
- BS EN 61243-3:2014 – Live Working Voltage Detectors, Two-Pole
- Electrical Safety First – Best Practice Guide 2: Guidance on the Management of Electrical Safety and Safe Isolation Procedures for Low Voltage Installations
- HSE Electricity at Work – Safe Working Practices (HSG85)
- HSE Memorandum of Guidance on the Electricity at Work Regulations 1989
- HSE Guidance Note GS38 – Electrical Test Equipment for Use by Electricians

3. Purpose and Objectives

The purpose of this policy is to implement rigorous processes to ensure that electrical safety is managed correctly in line with current legal and other requirements. It is aimed principally at protecting operatives against serious or fatal electrical injuries, which is of particular relevance during the final stages of construction and during maintenance and servicing activities.

The key objectives are:

- Compliance with all applicable legal and other requirements as referenced in this policy.
- Prevention of injury and ill health through risk assessment and safe systems of work.
- Addressing environmental obligations, including the correct disposal of waste electrical equipment.

4. General Awareness and Responsibilities

All operatives are responsible for taking care of themselves and of those who may be affected by their acts or omissions when working with electrical systems and equipment. Prior to use, all electrical equipment must be visually inspected for damage to mains leads and equipment casing, and used only for its intended purpose in accordance with the manufacturer's instructions.

Care must be taken when electrical equipment is moved or cleaned. End users must ensure that connections to the electrical infrastructure are made safely and under appropriate conditions: hands must be free of moisture, and trailing leads must not create a trip hazard. All portable electrical equipment, whether in the office or on site, must be PAT tested and display a valid pass sticker.

Where an operative discovers an unsafe electrical installation that is not their own work, they must not proceed with any related work until the matter has been reported to their supervisor and, where appropriate, to the client or principal contractor. The obligation to report is not discretionary.

5. Disposal of Waste Electrical and Electronic Equipment (WEEE)

The WEEE Regulations, as updated in 2018, place a legal obligation on companies to dispose of all waste electrical items in accordance with defined guidance. Wherever possible, electrical component waste should be reused or recycled. Such waste must be segregated from general waste and clearly labelled as electrical goods for disposal.

6. Competency

All operatives required to use, install, maintain, inspect, or test electrical equipment must be provided with appropriate information, instruction, and training to enable them to carry out their work safely and to recognise potential electrical hazards. Where necessary, a risk assessment must be prepared to identify the hazards involved and to determine appropriate control measures.

Regulation 12 of the Electricity at Work Regulations 1989 requires employers to ensure that employees involved in work on electrical systems are competent to do so. Where an operative is not yet fully competent, they may only carry out such work under the direct supervision of a competent person.

7. Approved Subcontractors

Operatives carrying out work on the LV infrastructure must adhere to BS 7671, BS 5839, and all other relevant British Standards, including Part P for work in domestic premises. They must be competent to work unsupervised on LV systems; this requires qualification as an electrician or as a qualified fire systems installer holding an ECS Gold Card or FIA Fundamentals Part 1 and Part 2 certificates.

Subcontractors working only on the ELV side of the installation must be sufficiently experienced and familiar with the infrastructure of a working fire system. Where work involves the fire panel, the minimum requirement is an ECS Fire Engineer Gold Card; the FIA Fundamentals Part 1 and Part 2 certificates are strongly preferred.

8. Personal Protective Equipment

Appropriate PPE must be worn whenever working in proximity to LV systems or equipment. This includes, as a minimum, insulated tools and, where required by risk assessment, voltage-rated gloves, eye protection, and flame-resistant clothing. The selection and use of PPE for electrical work is governed by the Company's PPE Policy (P09) and by the relevant risk assessment for the task.

PPE is a control measure of last resort and does not substitute for safe isolation. It must always be used in addition to, not instead of, the safe isolation procedures set out in this policy.

9. Permit to Work and Isolating the Supply

The relevant written permission must be obtained from the client before any work commences in a panel room or distribution board area. Where a formal Permit to Work is required, its conditions must be complied with in full: this includes signing for keys, completing the permit documentation, and returning both the keys and the completed permit when the work is finished or at the end of the working day.

Installation work connects back to the panel, where maintenance and servicing will continue long after the main works are complete. It is essential, therefore, to understand the

dangers of working in close proximity to LV switchgear and distribution equipment, and to follow the correct procedure for isolating the supply circuit to the fire panel before any work is carried out on the loops controlled by that panel.

All installation and remedial work must be carried out with the system dead. Commissioning and servicing may require the system to remain live for functional testing, and this is acceptable where the purpose is to confirm correct operation of the panel and connected devices. What is not permitted under any circumstances is working with exposure to live, unsheathed, or unterminated conductors.

Safe isolation does not refer solely to fitting a lockoff device to a circuit breaker. It encompasses all acceptable means of isolating a system or circuit being worked on. For a fire system this typically means securing the supply spur. It is important to understand that removing the fuse alone does not constitute safe isolation; the fuse housing itself must also be locked off after fuse removal, to prevent inadvertent replacement. Any fuse or key must remain in the possession of the person in charge of the work at all times.

Although contact with ELV conductors is unlikely to present a serious health risk, best practice and safe systems of work require that legal requirements are applied consistently, regardless of perceived risk. This is the standard expected of a professional tradesperson.

10. Dead Working

Where the supply has been cut off to permit dead working, Regulation 13 of the Electricity at Work Regulations 1989 requires that adequate precautions are taken to prevent electrical equipment that has been made dead from becoming electrically charged again while work is in progress, if doing so could create danger.

In practice this means ensuring that conductors and equipment cannot inadvertently be re-energised while work is taking place. Disconnection of the electrical supply requires separation from every source of electrical energy, including the disconnection of any backup batteries.

11. Live Working

Live working on the LV side of the installation is not permitted under any circumstances. Only the ELV side of the installation may be worked on in a live state, in order to minimise the risk of death or serious injury.

Under Regulation 14 of the Electricity at Work Regulations 1989, live working is only lawful where it is unreasonable in all the circumstances not to do so. MW Fire Ltd does not consider it reasonable for its operatives to work on or near uninsulated live conductors, and no such work is sanctioned.

12. Testing Instruments

The preferred instrument for proving isolation is a proprietary test lamp, because it provides a clear visual indication: the lamp will not illuminate in the absence of current. A two-pole voltage detector is also commonly used. Whichever instrument is selected, it must comply with the recommendations of HSE Guidance Note GS38, Electrical Test Equipment for Use by Electricians.

The following instruments are not adequate for proving isolation and must not be used for this purpose: multimeters, non-contact voltage indicators, and screwdrivers with built-in voltage detection. Research has revealed that 6% of electricians believe they are

experienced enough not to make mistakes and therefore do not use any test equipment to prove a system is dead. 46% believe that signage and verbal communication are adequate precautions. 43% believe that locking the switch room is adequate. All these beliefs are wrong. Not following rigid procedures costs lives.

A proving unit is a separate portable power source used to confirm that a voltage detection instrument is functioning correctly. The instrument must be tested using the proving unit both before and after taking a measurement. This guards against the scenario where an instrument has been damaged during the test and has given a false 'dead' reading. Instruments must be calibrated at least every twelve months. Where a Check Box is used to calibrate multiple instruments, the Check Box itself must also be calibrated at least annually.

13. Safe Isolation: General Principles

The correct isolation point for the fire panel must be identified and locked off whenever work is carried out on the panel or its loops. For most fire system installations, the isolation point is a dedicated unswitched FCU (BS 1363-4), which is an acceptable means of supply disconnection under the IET Wiring Regulations.

Where there is any doubt, any circuit that is incomplete or has not yet been fully inspected and tested must remain securely isolated at the supply end. This means locking off the circuit breaker at the distribution board that feeds the supply spur for the fire panel. Whichever means of isolation is used, it must remain under the direct control of the competent person carrying out the work at all times.

14. Fuses

Locking off an FCU is an acceptable means of isolation. This is achieved by removing the fuse and locking off the fuse compartment. Removing the fuse alone is not sufficient, because another person could inadvertently replace it and re-energise the panel. A warning sign must also be placed at the isolation point to indicate that the circuit has been isolated and is being worked on.

Safe isolation via an FCU is only complete when the fuse has been removed and retained in the pocket of the person carrying out the work, the fuse housing has been locked off, and the warning sign is in place. Where this method is not practicable, the incoming supply to the fuse must be isolated instead.

Backup batteries (secondary supply) must also be isolated. Failure to do so can allow circuits under automatic control to be re-energised even when the primary supply has been cut.

15. Proving Dead

Before isolating the panel, the known live supply may be used to prove the testing instrument if a proving unit is not available. Immediately after cutting the supply and completing the lockoff, the instrument should be used again to confirm that the correct isolation point has been secured.

Having confirmed that the lockoff is at the correct isolation point, because the voltage instrument detects no voltage between line and neutral, further tests are still required to confirm the panel is fully dead. A single voltage test is never sufficient. The full range of tests set out in the Safe Isolation Procedure below must always be completed.

16. Safe Isolation Procedure

The following procedure must be followed without exception. Shortcuts are not permitted.

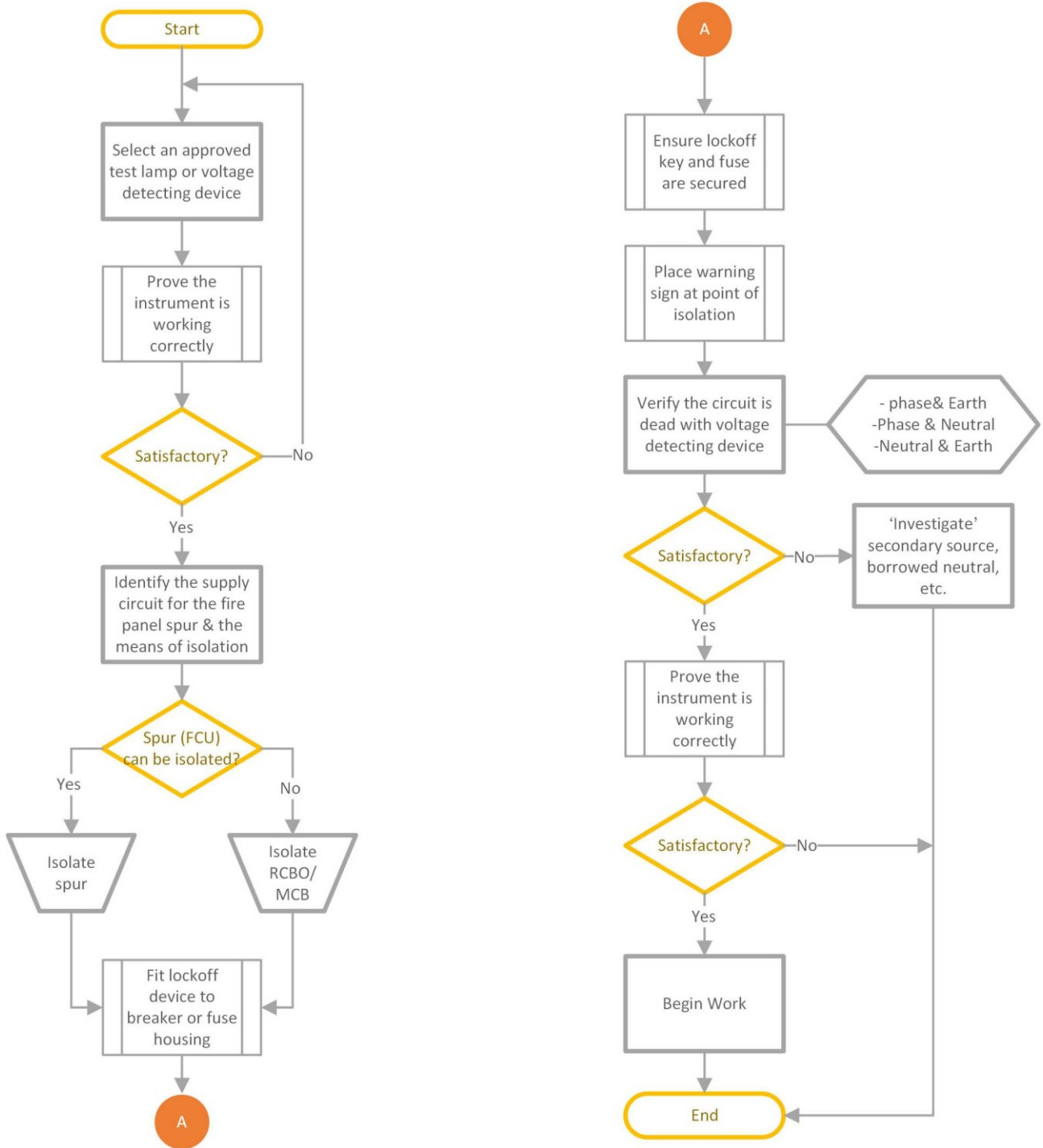
1. Obtain written permission from the client or customer to carry out the work.
2. Conduct a risk assessment as required by the Management of Health and Safety at Work Regulations 1999.
3. Locate all sources of supply, including any standby generators and UPS systems, and isolate the supply to the panel being worked on.
4. Secure the isolation point with a lockoff device and place a warning sign at that point.
5. Retain the fuse or key for the lockoff; this must remain in the possession of the person in charge of the work throughout.
6. Disconnect the link of any standby batteries to the panel.
7. Select an approved two-pole voltage tester compliant with BS EN 61243 and GS38.
8. Prove the testing instrument is working correctly using a known live source or proving unit.
9. Test for dead at the panel: take readings between earth and all line conductors.
10. Test for dead at the panel: take readings between neutral and all line conductors.
11. Test for dead at the panel: take readings between all line conductors.
12. Prove the testing instrument is still working correctly using a known live source or proving unit.

17. Policy Review

This policy will be reviewed annually, normally in January, or following any significant incident involving electrical work on Company business.

APPENDIX A

Safe Isolation Flowchart



APPENDIX B

Safe Isolation Checkoff Sheet (of live boards with a permit to work)

This procedure must be followed – use only GS38 compliant instruments

- Establish the means of isolation for supply and for circuits to be worked on
- Identify the circuits to be worked on
- Establish that it is safe to cut power to those circuits
- Ask for permission to isolate
- Lock off MCBs, RCDs or incoming isolator
- Use master key padlock and warning tag
- Place key in pocket
- Place sign on distribution board and at place of work if necessary
- Use proving unit with tester
- Test for dead: (then test circuit protective device)

SINGLE PHASE

L-N
L-E
N-E

THREE PHASE

L1-L2
L1-L3
L2-L3
L1-N
L2-N
L3-N
L1-E
L2-E
L3-E
N-E

- Use proving unit with tester
- Remove neutral of circuit being worked on (tape, place out of reach)
- DO WORK
- Test circuits
- Remove signs
- Remove lock offs
- Ask for permission to energise
- Switch on protective devices