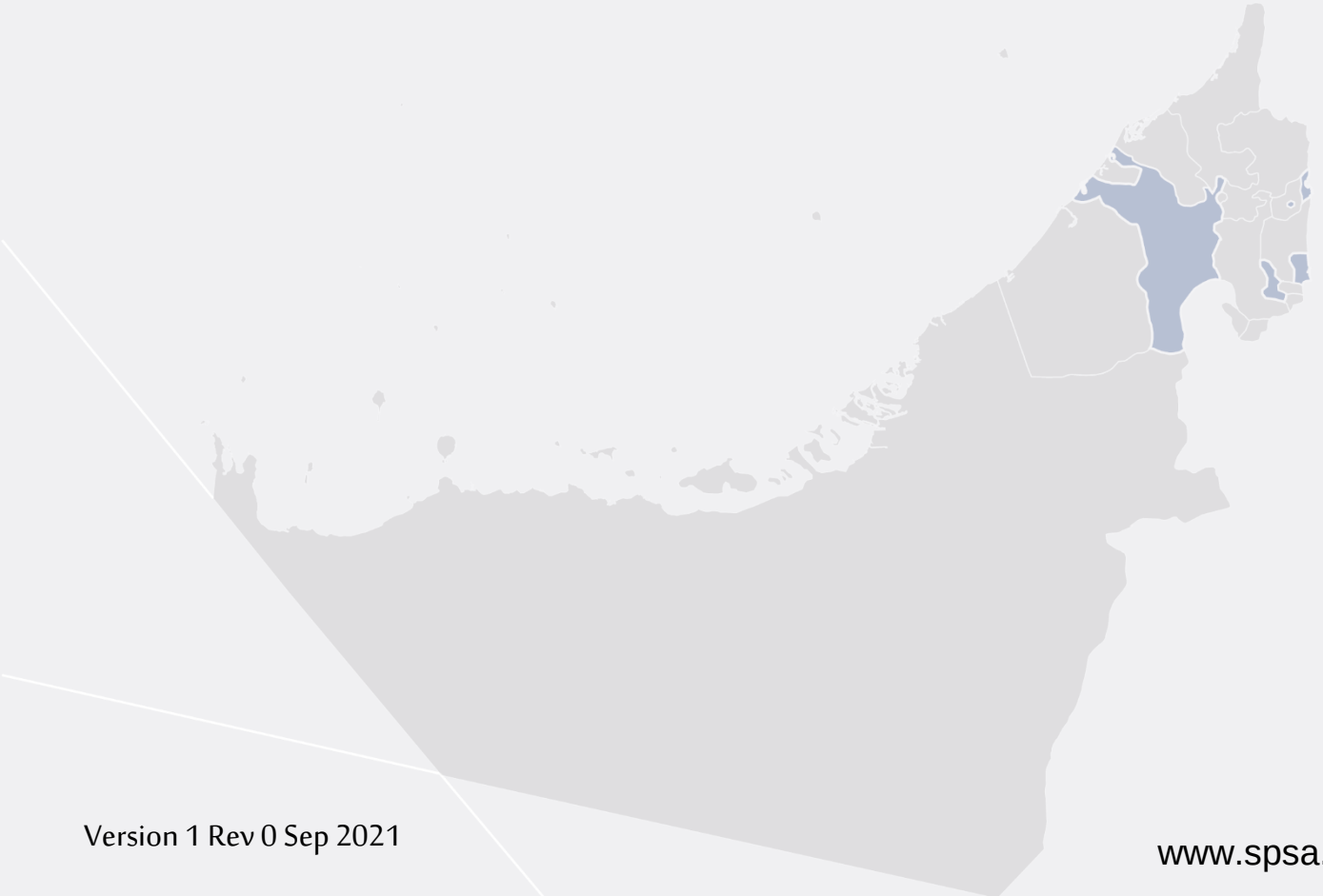
نظام الشارقة للسلامة والصحة المهنية
Occupational Safety & Health Sharjah

حكومة الشارقة
هيئة الوقاية والسلامة
Government of Sharjah
Prevention And Safety Authority

Code of Practice

Electrical Safety at Work

OSHJ-CoP-05



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1 Introduction

Electricity is at the heart of many modern technologies. Any use of electricity has the potential to result in personal injury or fatality as well as fire and explosion.

This code of practice deals with electrical hazards in the workplace and the measures that can be taken to control them.

2 Purpose and Scope

This Code of Practice (CoP) has been developed to provide information to entities to assist them in complying with the requirements of the Occupational Safety and Health System in Sharjah.

This Code of Practice (CoP) defines the minimum acceptable requirements of the Occupational Safety and Health System in Sharjah, and entities can apply practices higher than, but not lower than those mentioned in this document, as they demonstrate the lowest acceptable level of compliance in the Emirate of Sharjah.

This Code of Practice excludes portable electrical equipment; further information on this subject can be found in OSHJ-GL-08: Portable Power Tools.

This Code of Practice excludes requirements for the construction of electrical systems; further information on this subject should be obtained from the Sharjah Electricity, Water and Gas Authority.

3 Definitions and Abbreviations

Entities:	Government Entities: Government departments, authorities or establishments and the like in the Emirate. Private Entities: Establishments, companies, enterprises and economic activities operating in the Emirate in general.
Risk:	Is the combination of likelihood of the hazard causing the loss and the severity of that loss (consequences).
Risk Assessment:	The systematic identification of workplace hazards and evaluation of the risks associated. This process takes existing control measures into account and identifies and recommends further control measures where required.
Hazard:	Anything that has the potential to cause harm or loss (injury, disease, ill-health, property damage etc).
Competence:	The combination of training, skills, experience and knowledge that a person has and their ability to apply all of them to perform their work.
Disconnected:	The equipment or a part of a system that is not connected to any source of energy.
Electrical Isolation:	The equipment or part of an electrical system which is disconnected and separated by a safe distance (the isolating gap) from all sources of electrical energy in such a way that the disconnection is secure, and it cannot be re-energised accidentally or inadvertently.

Electrical Equipment:	Includes anything used, intended to be used or installed for use, to generate, provide, transmit, transform, rectify, convert, conduct, distribute, control, store, measure or use electrical energy.
High Voltage:	A voltage in excess of 1000 V ac or 1500 V dc. Voltages below these values are 'low voltage'.
Live Equipment:	Equipment that is at a voltage by being connected to a source of electricity.
Live Work:	Work on or near conductors that are accessible and 'live' or 'charged'. Live work includes live testing, such as using a test instrument to measure voltage on a live power distribution or control system.
Manufacturer's Manual:	The instructions, procedures and recommendations provided by the manufacturer to ensure the safe operation, maintenance and repair of the equipment.

4 Roles and Responsibilities

4.1 Entity Responsibilities

- Identify all foreseeable hazards, these hazards shall be recorded;
- Ensure all foreseeable hazards are assessed and effective control measures implemented;
- Develop, implement and maintain safe systems of work based on the results of the risk assessment;
- Provide information, instruction, supervision and training to employees on the electrical systems they are using;
- Ensure electrical systems are suitable for use, and for the purpose and conditions in which it is to be used;
- Ensure employees are competent and have experience of the electrical system to be worked on;
- Ensure electrical systems are maintained in a safe condition for use and as per the manufacturer's manual;
- Provide emergency equipment, which is adequately maintained, inspected and available for the planned work activities;
- Have an adequate emergency response procedure in place.

4.2 Employee Responsibilities

- Not endanger themselves or others;
- Follow precautionary control measures to ensure work activities associated with electrical safety are performed safely and without risk to health;

- Cooperate with the entity and receive safety information, instruction, supervision and training;
- Report any activity or defect relating to electrical safety which they know is likely to endanger the safety of themselves or that of any other person.

5 Requirements

The entity shall plan their work activities, ensuring they are appropriately supervised and carried out safely and without risk to health. Planning includes conducting a risk assessment, the selection of work equipment and preparation for emergencies. Work activities on electrical systems should cause the minimum inconvenience to utility users.

Liaison with the relevant authorities or statutory bodies may be required in planning the works to obtain any necessary licences, approvals and temporary orders or notices in advance of the works commencing. For emergency works, as much warning must be given to utility users as possible.

Due to the hazards associated with electrical safety the management of risk is imperative, this can only be achieved through effective communication, robust controls and co-ordination at all levels.

5.1 Planning

Planning shall consider the management, supervision, implementation and completion of the work and should lead to the development of a safe system of work based on information in the electrical safety rules and a task specific risk assessment and shall consider the following, including but not limited to:

- The work activities to be conducted;
- The hazards of the electrical system or equipment to be worked on and the risks associated with the work;
- The people doing the work, their competence and the level of supervision necessary;
- The precautions to be taken and the safe system of work to be employed;
- The possibility that the nature of the work may change, such as a testing job may turn into fault finding.

5.2 Risk Assessment

The entity is required to assess the risks associated with electrical safety and take all reasonably practicable precautions to ensure the safety of employees and others. The entity wherever possible should eliminate working on live electrical system.

The risk assessment shall take into consideration the following factors, including but not limited to:

- The type of electrical system;
- The initial integrity and the manufacturer’s manual;
- The environment in which it is used;
- The type of the electrical equipment, fixed or handheld;

- Its intended use and foreseeable abuse;
- Its age, the frequency and duration of use;
- The effects of any modifications or repairs;
- Analysis of previous records of maintenance.

Further information on risk assessment can be found in OSHJ-CoP-01: Risk Management and Control.

5.3 Selection and Suitability of Equipment

The entity shall ensure that they have adequate processes for the selection of suitable electrical equipment. The safe selection of suitable electrical equipment for particular tasks and processes makes it possible to reduce or eliminate many risks to the safety and health of employees in the workplace. This applies to all types of electrical equipment, both in normal use as well as during other operations, such as maintenance.

The entity shall consider when designing and selecting of electrical equipment, including but not limited to:

- The equipment manufacturer's ratings;
- All anticipated load and fault conditions;
- The inter-relationship between items of equipment;
- The need to provide protective devices;
- The ability of components to withstand any expected fault current;
- Likely environmental conditions;
- User requirements;
- Testing, commissioning and maintenance requirements;
- Conformance with recognised standards;
- The requirements of relevant authorities or statutory bodies.

5.4 Strength and Capability of Electrical Equipment

Electrical equipment shall not be put into use where its strength and capability may be exceeded in such a way that increases risk.

Strength and capability refers to the ability to withstand thermal, electro-magnetic and voltage stresses and other effects of electric current, both in normal use and under fault conditions.

Most electrical equipment will only be able to withstand short circuits for brief periods, so any protective devices used should be capable of clearing the fault well within this period. Protective conductors and equipment should be able to survive beyond fault clearance times. Insulation should be effective under normal and fault conditions.

The selection of cables of an appropriate size should take account of the method of installation. Rated current carrying capacities can be considerably reduced where cables are grouped, bunched or insulated.

5.5 Adverse or Hazardous Environments

Electrical equipment should be constructed and protected to prevent risks arising from the exposure to adverse or hazardous environments, including:

- Potential mechanical damage;
- The effects of weather, natural hazards, temperature or pressure;
- The effects of wet, dirty, dusty or corrosive conditions;
- Any flammable or explosive substance, including dust, vapours or gases.

Suitable protection should be provided against hazardous environments, which can vary with place and time. The protection necessary will depend upon the nature and likelihood of the hazard and the severity of the resulting risk.

5.6 Insulation, Protection and Placing of Conductors

In order to reduce the risk of shock, all conductors, including the earth and neutral in a system, which may increase risks should so far as is reasonably practicable:

- Be suitably insulated and protected to prevent risk;
- Have such precautions, including suitable placing where appropriate, to prevent risk.

This requirement ensures that no risk will arise from any conductors in a circuit. Insulation is the most common means of preventing direct contact with a current carrying conductor. It can also protect against burns, fire, arcing and explosion.

Fixed electrical system conductor cables are generally insulated, and may be further protected by ducting, conduit and trunking systems. Cables may be further protected from mechanical damage and tied to a cable tray system or buried. Where cable connection terminations are made, they should be “finger-proofed” to prevent access.

Conductor enclosures and placement should prevent ease of access, overhead high voltage transmission cables are normally un-insulated; however they are placed at such a height so as to prevent risk under normal circumstances.

5.7 Earthing or Other Suitable Precautions

Precautions shall be taken, either by earthing or other suitable means, to prevent risk from a conductor which may become charged through the use of a system or from a fault in the system. This is to prevent all risks arising when a conductor, other than a circuit conductor, becomes charged due to some fault or process condition.

There are three general methods used to eliminate these risks, which are:

- By ensuring that the non-circuit conductors do not become charged by use of double insulation;
- By ensuring that if the non-circuit conductors do become charged, that the values and duration of voltage and current are such that risk will not arise, such as by use of earthing and protective devices or use of safe voltages;
- By ensuring that if the non-circuit conductors do become charged, risk will not arise, such as by use of equipotential bonding or earth free non-conducting environments.

The above techniques may be used singly or in combination.

5.8 Integrity of Referenced Conductors

No impedance shall be placed in a conductor that is connected to earth or other reference point.

This is particularly important in the case of 3-phase systems where the neutral is connected to earth at the source of supply to ensure that the phase voltages are similar and not unduly affected by unbalanced phase loading. Similarly, it is important where the neutral and earth conductors on the incoming supply are combined as any open circuit is likely to affect any earthing arrangements provided for the electrical installation.

This is mainly of concern to the relevant power supply authority; however, it is relevant to those workplaces that take supplies at high voltages and are responsible for their own on-site distribution.

This does not prohibit devices such as a proper joint, a bolted link, a removable link or a manually operated knife joint to be placed in the protective conductor, however, some devices are prohibited, such as fuses. The terminations of protective conductors should be robust and protected from the effects of corrosion.

5.9 Connections

Every joint and connection on a system, including supply and protective conductors, shall be mechanically and electrically suitable for use. Connections include terminals, plugs and sockets and any other means of jointing. This applies to both temporary and permanent connections.

Mechanical protection should ensure the integrity of insulation and conductance under all conditions of use, including any likely fault conditions.

Plugs and sockets not rated for making or breaking under load should have effective arrangements to ensure that the connections are made or broken under no-load conditions.

Cables should be correctly affixed to equipment by properly constructed glands, plugs or sockets.

The importance of sound connections is to prevent “hot spots” under normal operating conditions that may lead to failure of a connection. Many workplaces use thermal imaging equipment to identify hot spots in systems when they are under load as part of a predictive maintenance process.

5.10 Means for Protecting from Excess Current

Electrical systems shall be risk assessed to determine a suitably located efficient means for protecting every part of a system from excess current.

It is necessary to install protective devices, such as:

- Fuses;
- Miniature circuit breaker (MCB);
- Residual current device (RCD).

These protective devices ensure that all parts and users of an electrical system are protected. Their rating should not exceed the current carrying capacity of the circuit for which they offer protection.

The types of fault requiring protection are normally overloads, short circuits, between live phases or live to neutral, and earth faults, live to earth.

5.10.1 Fuse

A fuse is a weak link designed to melt thereby breaking the circuit at abnormal currents. It is intended to protect the equipment and wiring from overcurrent and will not protect people from direct electric shock, as its operation is relatively slow.

The flow of electrical current generates heat; the higher the current, the greater the heat. Without a fuse, the equipment might be damaged and the wiring would eventually become hot enough to melt its insulation and start a fire.

The advantages of fuses is that they offer good overload protection, are relatively cheap and are usually easily replaced.

Disadvantages are wide operating current tolerances, they can be replaced with a fault still on a system, they are relatively slow to operate and can easily be defeated by using a higher rated replacement.

5.10.2 Miniature Circuit Breaker (MCB)

MCBs are either thermal or electromagnetic mechanical devices, which perform the same function as fuses. Advantages are that as fixed devices they are less easily defeated, they can be reset, so do not need to be replaced, their operation is faster than a fuse, however, they are still not quick enough to protect against direct electric shock and they cannot be reset with the fault still on the system.

5.10.3 Residual Current Device (RCD)

These devices are commonly known as residual current devices (RCDs) or current-operated earth leakage circuit breakers (ELCBs).

RCDs are electro-magnetic mechanical devices that provide indirect shock protection and a means of overload protection in the event of an earth fault. They are very sensitive however, they do not provide overload protection for short circuit overload, therefore a fuse or a MCB should always be fitted in the supply.

5.11 Means for Cutting off the Supply and for Isolation

Electrical systems shall be provided with suitable means for cutting off the supply, also known as switching, and the isolation of electrical equipment, including where appropriate, methods for identifying circuits, such as diagrams or isolator labels.

It is important to differentiate between switching and isolation. Switching means depriving electrical equipment of electrical energy, whereas isolation means the disconnection and separation of the electrical equipment from every source of electrical energy in such a way that the disconnection and separation is secure. Therefore, isolation requires steps to be taken to ensure that the electrical equipment cannot be inadvertently re-energised.

Switches should be capable of cutting off the supply in both normal or operating, and abnormal or fault, conditions and be in a suitable location that allows ease of access, preferably close

to the equipment they are controlling. Switches should be clearly labelled so there is no doubt as to the equipment it controls.

Isolation shall include the following:

- Establish an air gap between electrical contacts to prevent current flow, such as switching or fuse removal;
- Include a safety system, such as lockout tagout to prevent removal of the barrier by un-authorised persons;
- Be clearly labelled so that there is no doubt about the equipment it controls.

Isolators should be readily visible and be located to enable ease of access and operation.

Circuit identification and labelling of equipment is especially important where the electrical equipment is remote from the switchboard that provides the point of isolation, or, where a number of items of equipment are fed by a single isolator.

5.12 Workspace, Access and Lighting

Adequate working space, means of access and lighting should be provided on, near or around electrical equipment that is to be worked on.

This requirement applies to any work, not only live work, and includes protecting those whose work is not associated with the electrical system in order to ensure a safe working environment whenever work is to be undertaken that may increase risk.

Natural or fixed permanent lighting is preferred, although torches and hand lamps may be used. Whatever the lighting source, it should be sufficient to allow work to be carried out safely.

Further information on appropriate lighting levels can be found in OSHJ-CoP-15: Employee Welfare and Wellbeing.

5.13 Temporary Electricity Supplies

All temporary electricity supplies shall be supplied at a reduced voltage, wherever possible, this includes all electrical tools and equipment to be used. Exceptions will need to be made for electrical equipment requiring higher voltage, such as welding machines.

5.14 Safe Use, Maintenance, Inspection and Repair of Electrical Systems

The entity shall ensure that all systems are maintained to prevent risk. The operation, maintenance, inspection, use and repair of a system is carried out to prevent risk and the equipment provided for protecting employees working on or near electrical equipment is suitable, maintained and properly used.

Maintenance, including inspection and testing, of electrical equipment is important to ensure that it remains in an efficient state and in good working order.

Maintenance strategies including opportunistic maintenance, emergency/breakdown maintenance, planned preventative maintenance and routine condition monitoring apply to electrical equipment.

The maintenance scheme should consider the following, including but not limited to:

- Identify the equipment to be maintained, inspected and tested;
- Define what must be done on which equipment;
- Define how the work will be done;
- Define who will do the work;
- Identify and record the work instruction systems;
- Define the audit and review systems.

Inspection and testing should not cause risk to persons or cause damage to property and equipment.

Periodic inspection and testing of fixed installations in a workplace should also be considered, including but not limited to:

- To verify compliance with legal and best practice requirements;
- On a change of use of the workplace;
- On change of ownership or tenancy of the workplace;
- After alterations or additions to an original installation;
- Due to increased loading of the installation;
- Where damage to the installation occurs or is suspected.

The entity shall record and retain maintenance, inspection and testing records.

5.15 Working on Systems Made Dead

The entity shall take adequate precautions to prevent electrical equipment that has been made dead from becoming electrically charged during work if risks arise.

To ensure that adequate precautions are taken, a written safe system of work shall be in place whenever electrical work which increases risk is to be carried out. The safe system of work shall consider the following, including but not limited to:

- Planning the job including the identification of equipment, points of isolation and any emergency actions required;
- Disconnection from the power supply and any other potential electrical sources;
- Secure isolation, such as by removal of fuses, locking switches or securing fuse boards and socket outlets with insulating inserts;
- Proving the circuit is dead. The sequence is to “prove” the test instrument on a live voltage to ensure that it is functioning correctly, test the isolated equipment is dead then prove the test instrument again;
- Earthing as an additional precaution. An earth lead that is capable of carrying a fault current should be attached to the point of isolation, and at the point of work if it is remote;

- Posting of cautionary notices at the place of isolation, warning that work is being carried out on the equipment and that to re-energise it would be hazardous;
- Consideration of other precautions, such as physical barriers, temporary insulation, permits to work;
- Communication of the safe system of work. Work shall not begin until it is established that all relevant persons understand the work to be done, the precautions, additional hazards that may arise and the action to be taken in an emergency.

Permits to work enhance the safe system of work, as they should ensure that precautions are taken before the work activity commences and are removed on completion of the work.

Further information on permit to work can be found in OSHJ-GL-16: Permit to Work.

5.16 Live Working

No person shall be engaged in any work activity on or near any live conductor, other than one that is suitably insulated, unless:

- It is unreasonable in all circumstances for it to be dead;
- It is reasonable in all the circumstances for it to be live;
- Suitable precautions are taken to prevent injury.

These requirements also apply to situations where conductors are covered with insulating material but not suitably covered by it, such as excavation near underground cables.

Other examples where live work may be acceptable, include but not limited to:

- Commissioning or monitoring the operation of electrical equipment;
- When other hazards may arise from electrical supply failure;
- When there is a need to comply with statutory requirements;
- Where the cost grossly outweighs the risk, and the risk of injury can be reduced to an acceptable level.

To prevent injury from live work the following precautions shall be taken, including but not limited to:

- The use of adequately trained and competent persons to work on live equipment;
- The provision of adequate information about the conductors, associated electrical system and foreseeable risks;
- The use of suitable tools including insulated tools, equipment and personal protective equipment;
- Effective control of the area where there is risk from live conductors;
- The use of insulated barriers and screens;
- The use of suitable instruments and test probes;
- Accompaniment by another competent person;

- The provision of specially equipped areas for routine testing;
- Restriction of live working to certain areas.

5.17 High Voltage Work

Work on high voltage systems are subject to the same safety precautions as live working, safe systems of work, work space and competence of employees that conduct high voltage work. The isolation of electrical systems prior to maintenance activities is important. Permits to work are essential for work on high voltage systems and shall be clearly and legibly written and contain the following, but not limited to:

- The identity of the persons issuing the permit and supervising the work;
- A signature from the person who proves that the circuit is dead;
- Sufficient detail to identify the equipment made dead and its location;
- The location of the points of isolation;
- The location of temporary earth connections;
- The location of warning notices, including live equipment notices and temporary locks;
- A description of the work to be carried out;
- Any other hazards that may arise;
- Any further precautions.

Compliance with the safe system of work, including any permit to work where issued, should be monitored.

Isolation shall be by means of a device that has a safe isolating gap between live parts and those that have been made dead. Work on electrical equipment can require more than one point of isolation, such as the primary and secondary sides of transformers. Earthing of conductors at the point of disconnection of the supply is essential and additional earths may be necessary at the place of work. Often in high voltage work, earths will be required to ensure that voltages are not induced from adjacent live circuits, especially in the electrical supply industry.

Access to high voltage areas shall be restricted to authorised persons. Physical barriers should be more substantial than those used for low voltage systems.

5.18 High Voltage Live Working

The requirements and restrictions on live working are applicable to high voltage live working. There are occasions when live working has to be carried out. As with all live working, section 5.16 of this document must be applied to ensure that the correct decision is taken to work live, and rigorous controls applied.

There are specific responsibilities for live working placed upon the live working supervisor and live working teams. The live working supervisor shall ensure the following, including but not limited to:

- Safe working conditions for the teams;

- Site safety inspections are performed;
- Work instructions, plans are adequate for the tasks undertaken;
- Work is performed in accordance with the prescribed standards, procedures, rules and regulations;
- The provision of adequate information about the conductors, associated electrical system and foreseeable risks;
- A sufficient number of staff are allocated to carry out the work safely;
- Regular safety audits are conducted.

5.19 High Voltage Glove Working

High voltage glove working, often known as hot glove working, involves the use of insulated gloves, aprons and tools which are utilised as a protection mechanism for the person carrying out the work, such as a utility cable jointer. Specific procedures will need to be in place, but in all cases, it is the personal protective equipment which provides the final defence.

As such, some typical rules for personal protective equipment are:

- Electrical high voltage personal protective equipment for live working must be clearly marked and electrically tested;
- The entity also needs to ensure that the equipment is maintained in a safe and reliable condition;
- If there is a risk that protective equipment, such as rubber gloves, can be damaged during use, employees should protect the insulating material;
- Employees should wear non-conductive head protection when there is a risk of head injury from electrical shock or burns because of contact with exposed, energised parts;
- Employees should wear flame resistant overalls, eye and face protection when there is a risk of injury from electric arcs or flashes or from flying objects resulting from an arc flash/blast;
- When working near exposed, energised conductors or circuit parts, employees should use insulated tools and handling equipment if they might make contact with live components or wiring;
- Fuse handling equipment must be used to remove or install fuses when fuse terminals are energised. The tool must be insulated for the circuit voltage.

Hot stick techniques are another method used by utility companies. Hot stick work involves the use of rods, tested and approved to a suitable rating for the work being carried out, and designed to be used in closer proximity to the work area, but still outside any safety zones. This approach to working allows a more varied range of activities to be carried out.

The hot glove methodology often combines with the use of hot stick techniques to complement hands on working. The range of work that can be carried out using hot glove techniques is extensive.

5.20 Overhead Live Line Work

Overhead live line work is carried out where the risks have been demonstrated as tolerable, to allow work to be carried out without removing the supply from the load.

Key tasks and responsibilities for a live line working team, include but not limited to:

- Ensure safety on site, including that of third parties, while work is undertaken;
- Liaise with the distribution control room when live working is undertaken on the high voltage network;
- Carrying out briefings and site meetings on the day of the job to determine the exact procedure for the job. This procedure is often specific to the site and the work to be carried out;
- Complete the required work following the correct codes of practice, method statements and specifications that apply to the entity and the work to be carried out;
- Advise the distribution control room of the condition the system is in when work is completed.

There are many ways of accessing a live line, such as using platforms, specially insulated MEWP's or helicopters to lower a basket onto a line. In all cases, as the overhead lineman approaches the line, an arc will often form as his body is charged. Although this arc carries no more than a few microamps, it can be uncomfortable or debilitating, and the employee must immediately bond himself electrically to the line to prevent further arcing.

Conducting wands can be used during the initial approach to first make the connection. Once on the line, the lineman is safe from shock as both he and the line are at the same electrical potential and no current passes through his body. When the work is completed, the process is reversed to remove him safely from the wire.

5.21 Personal Protective Equipment

So far as is reasonably practicable the entity shall ensure that electrical work can be performed without the need for personal protective equipment.

A risk assessment of the workplace shall be conducted to decide which, if any, personal protective equipment should be issued. In deciding which type to issue, the entity shall take into account the risk that the personal protective equipment will fit the wearer and allow them to work comfortably. If more than one task is to be performed, the entity should ensure that the personal protective equipment is compatible and of use for every task that is to be undertaken.

The entity shall provide employees with the personal protective equipment identified in the task specific risk assessment and ensure that it is:

- Suitable for the use for which it is provided;
- Maintained in a condition suitable for that use;
- Used properly.

Specific personal protective equipment that could be selected for electrical work, include but not limited to:

- Safety helmets with full/partial brims;
- Safety glasses with side shields;
- Face masks/shields;
- Suitable safety footwear, rated dielectric footwear;
- Insulating gloves which are rated, used along with leather/cloth linings for shock protection;
- Arc flash protective kit, including hood, helmet, coat, overall, gloves and safety glasses;
- Insulated tools;
- Electrical insulation blankets;
- Live line tools/hot sticks.

Further information on personal protective equipment can be found in OSHJ-GL-07: Personal Protective Equipment.

6 Training

Training shall be provided for employees who need to have adequate knowledge to use and maintain electrical systems and equipment safely.

The entity shall provide training for employees in languages and in a format that employees understand, including but not limited to;

- Specific information, instruction on how to operate electrical systems and equipment safely;
- How to avoid risks, such as, check the electrical system is fully isolated prior to starting work;
- Use of specific electrical systems and equipment;
- Emergency procedures and response.

Periodic refresher training shall be conducted to ensure employees competency is maintained, including but not limited to:

- Where training certification has expired;
- Where identified as part of a training needs analysis;
- Where risk assessment findings identify training as a measure to control risks;
- Where there is a change in legal requirements;
- Where incident investigation findings recommend refresher training.

The entity must record and maintain accurate training records of OSH training provided to employees.

Further information on training can be found in OSHJ-GL-27: Training and Competence.

7 Emergency Preparedness and Response

The entity shall be prepared for emergencies that may occur during the use and maintenance of electrical systems and equipment.

The entity shall ensure the following, including but not limited to:

- If conducted under permit to work the emergency arrangements must be in place prior to the commencement of electrical work;
- Emergency response personnel are available, who can take charge and make decisions on behalf of the entity during an emergency and liaise with emergency services;
- Emergency response personnel are available, who are familiar with the work area ensuring the prompt evacuation of the workplace in the event of a fire;
- Adequate firefighting and first aid equipment is available for the type of work activities and the electrical equipment present in the workplace;
- Employees are trained in emergency response, including information of first aid arrangements and where first-aiders, first aid equipment and facilities are located;
- Employees are appointed as first-aiders and available at each location and during each working shift when work is being conducted.

Further information on first aid can be found in OSHJ-CoP-16: First Aid at Work.

Further information on emergency response plans can be found in OSHJ-COP-18: Emergency Preparedness and Response.

8 References

OSHJ-CoP-01: Risk Management and Control

OSHJ-CoP-15: Employee Welfare and Wellbeing

OSHJ-CoP-16: First Aid at Work

OSHJ-COP-18: Emergency Preparedness and Response

OSHJ-GL-07: Personal Protective Equipment

OSHJ-GL-08: Portable Power Tools

OSHJ-GL-16: Permit to Work

OSHJ-GL-27: Training and Competence

9 Document Amendment Record

TITLE	Electrical Safety at Work		
DOCUMENT AMENDMENT RECORD			
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