PROCEDURE

Electrical Safety Rules

Section	Key requirement
1. Introduction	In all work, Evoenergy's Life Saving Rules are non-negotiable.
2. Safe approach distances	Workers must observe an appropriate safe approach distance when working, or operating vehicles or mobile plant, near electrical apparatus. Work in the vicinity of electrical apparatus must be carried out in a safe manner and control measures taken must be consistent with the risk and work performed.
3. Training and authorisation	Persons working on or near electrical apparatus connected to the Evoenergy network must have training relevant to these electrical safety rules and authorisation for the duty to be performed.
4. General safety requirements	Consideration must be given to providing additional procedures for matters identified to ensure a comprehensive safe working environment. If a safety issue is recognised, that is not controlled through an existing procedure, then an appropriate procedure should be prepared to maintain a safe working environment.
5. Guidance when working on or near underground cables	Cables must be identified AND proven de-energised by testing or spiking prior to access.
6. Earthing electrical apparatus	Earthing devices must be applied by an authorised person following a safe to earth confirmation and placed to ensure the safety of workers.
7. Issue of access authorities and SCAP	An appropriate safe access system must be applied before any work is carried out on or near electrical apparatus.
8. Access for work on or near high voltage electrical apparatus	All high voltage (HV) electrical apparatus must be considered energised until isolated, tested and proved de-energised, earthed, and short circuited. an appropriate safe access system has been applied to allow work to be carried out on or near the HV electrical apparatus, and Job Risk Assessments are completed for the types of work to be carried out on or near the HV electrical apparatus.
9. Access to low voltage electrical apparatus	All low voltage (LV) electrical apparatus must be regarded as energised until isolated, tested and proved de-energised. appropriate safe procedures of work are established for work on the LV electrical apparatus, and job risk assessments are completed for the types of work to be carried out on or near the LV electrical apparatus.
10. Testing, commissioning and decommissioning electrical apparatus	Electrical apparatus must not be placed into service until it has been cleared for service.
11. Work in electrical stations	On entry or exit to any electrical station all workers must adhere to correct entry and safe working practices in the electrical station.
12. Metering	For work on metering installations, workers must be appropriately trained or authorised. The basic safe work principles set out in Section 9 – Access to Low Voltage (LV) Electrical Apparatus apply.

Contents

1 Introduction

1.1 Key Requirements

In all work, Evoenergy's Life Saving Rules are non-negotiable.

1.2 Disclaimer

The information contained in this document:

- has been developed for the use of Evoenergy, its contractors and all others mentioned in these Electrical Safety Rules (ESR) working on or near the Evoenergy electricity network.
- Should be read with all applicable laws, regulations, rules, codes, guidelines, standards, practices, and procedures.
- is, to the best of Evoenergy's knowledge and belief, correct at the date of publication.
- may change without notice and take effect on the date the change is made.
- is copyright and, except as permitted under the Copyright Act, no part may be reproduced by any process without written permission.
- is always uncontrolled when printed.
- should be checked to ensure it is current before it is used or relied on in any way, and
- includes Safe Approach Distances, which should be considered a minimum standard for all work near the Evoenergy electricity network.

Evoenergy excludes all liability for loss or damage of any kind arising from or relating in any way to the use of or reliance on the information in this document except for liability that cannot be excluded or limited by law.

1.3 Acknowledgement of Copyright

The development of these Electrical Safety Rules was based on the Code of Practice on Electrical Safety for work on or near high voltage electrical apparatus for the five Victorian Major Electricity Companies (Formerly known as Distribution Networks or Distribution Businesses – DB's) namely CityPower, Powercor, AusNet Services, Jemena and United Energy, with the transmission network owned and operated by AusNet Services.

These Major Victorian Electricity Companies, known as the Victorian Electricity Supply Industry (VESI) collectively, are members of the Distribution Sub-Committee of the Electrical Safety Committee in Victoria.

The Distribution Sub-Committee has given its written permission to Evoenergy for the Green Book to be used as the basis for the development of Evoenergy's Electrical Safety Rules. Evoenergy thanks VESI for its cooperation in this regard.

1.4 ESR Issues Register

For all queries or issues identified please contact Evoenergy on 13 23 86 or esr@evoenergy.com.au

1.5 Life Saving Rules

Life Saving Rules

At Evoenergy we work safe, so we return home safe and are always safe.

We always apply our **Life Saving Rules** to reduce the risk of serious injury or death to ourselves, our co-workers, the public and our customers.

These rules are non-negotiable and are the responsibility of every Evoenergy employee.

When I am on a job, safety is my priority. If I cannot implement these rules, I stop and escalate the issue to my Supervisor and Manager.

Breaking a **Life Saving Rule** can result in serious injury or death for me, a colleague, or people in my community.

These life-threatening outcomes are preventable if the **Life Saving Rules** are implemented correctly.

evoenergy

EVERY JOB, EVERY TIME

I actively participate in **Job Risk Assessments**, apply Safe Work Method Statements, **stop**, and reassess when conditions change.

I always **test before I touch** to prove the condition of the electrical apparatus I am working on.

I have the correct and current **training, licensing, and authorisations** appropriate for the task at hand.

I check and confirm equipment and apparatus is **safe to energise.**

My Personal Protective Clothing and Equipment (PPCE) is **inspected and used** as per requirements.

I **will adhere** to our drugs and alcohol procedure.

I will assess myself for **fatigue** and will work within my **capacity** and injury management **restrictions.**

1.6 Purpose

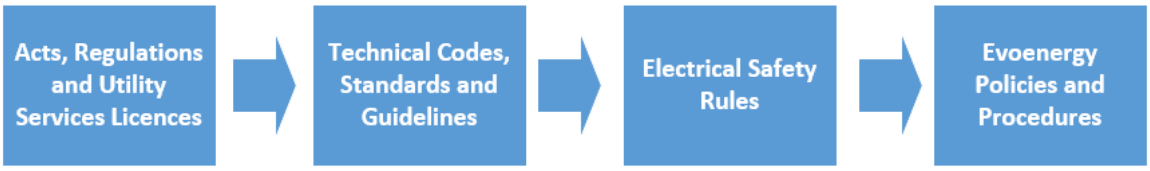
The purpose of these Electrical Safety Rules is to specify the safe working requirements and minimum standards for working on, near or in the vicinity of Evoenergy's electrical network within the Australian Capital Territory and the surrounding region where the network extends.

These Electrical Safety Rules detail the minimum general requirements for work to be carried out in the provision of access authorities and for work to be carried out under access authorities including electrical operating work.

These Electrical Safety Rules were created with the recognition that they will require periodic revision. They must be reviewed every five years and published on the Evoenergy website.

1.7 Scope

These Electrical Safety Rules provide the electrical safety principles for setting out procedures and responsibilities for all persons required to work on or near the electricity network. Work must be done according to these rules and relevant approved procedures and/or practices.



Evoenergy's compliance with these Electrical Safety Rules assists in meeting obligations imposed by the Work Health and Safety Act, the Utilities Technical Regulation Act and the electricity distribution license issued to Evoenergy by the Independent Competition and Regulatory Commission.

There is no expected conflict between these Electrical Safety Rules and an Act or Regulation. If anyone identifies such a conflict, they are asked to immediately notify Work Practices or the General Manager Evoenergy.

To change the minimum standard of these Electrical Safety Rules, Work Practices must be consulted to:

- Complete a hazard identification and risk assessment to ensure that persons are not exposed to any increase in risk and that community standards and expectations of managing risk are met.
- Document the process.
- Ensuring any variations are endorsed by the General Manager Evoenergy and that the Safety Committee is informed in writing.

To comply with the requirements of these Electrical Safety Rules, contractors and third parties must:

- apply the rules and procedures contained within these Electrical Safety Rules, or
- apply the rules to develop their own procedures equal to or exceeding the requirements set out in the Electrical Safety Rules.

1.8 Definitions

Access Authority means any form of authorisation which allows an authorised or supervised worker access to test or work on or near electrical apparatus.

- **Electrical Access Permit** means a form of authorisation which allows access to, and work upon, electrical apparatus.
- **Sanction for Testing** means a form of authorisation to allow energisation of electrical apparatus for testing purposes.
- **Permit to Work** means a document providing written permission to persons to work adjacent to de-energised network assets on the distribution network.

Adjacent means an area that is within Safe Approach Distances or near or in the vicinity of the Distribution Network's electrical apparatus.

Accreditation means the act of officially recognising specified criteria that enable a person to be authorised to work on or near the network.

ADMS means Advanced Distribution Management System software platform that supports distribution management and optimization.

Aerial cable means any insulated or covered conductor or assembly of insulated cores erected above ground or water, suspended in open air with support structures and forms part of an electricity network.

Aerial conductor means any bare conductor that is above ground or water, suspended in open air with support structures and forms part of an electricity network.

Appliance means any instrument or device designed for use near or in direct contact with energised conductors and/or electrical apparatus.

Approach, in relation to network components, refer to Near.

Approved means having appropriate organisation endorsement in writing for a specified function (see Written or in Writing).

Authorised Person means a person with technical knowledge or sufficient experience who has been approved or has the delegated authority to act on behalf of Evoenergy to perform the duty concerned. Authorisations in these rules are:

- **Authorised Electrical Operator (Electrical Operator)** means an approved person who has been assessed as competent against an approved training standard to carry out switching operations on electrical apparatus.
- **Authorised to Enter Electrical Stations** means an approved person who has been assessed as competent against an approved training standard to enter Electrical Stations.
- **Authorised High Voltage Live Line** means an approved person who has been assessed as competent against an approved training standard to carry out high voltage live line work on the network.
- **Authorised Near** means a person who is not an electrically qualified worker but has enough technical knowledge and experience to do non-electrical work that involves being near electric lines and has been approved by Evoenergy to work near electric lines.
- **Authorised Tester** means a worker who has been approved to receive a Sanction for Testing.
- **Authorised Third Party** means an approved person working for a third-party who has been assessed as competent against an approved training standard to work near to the network to perform work on third party assets. Refer to Third Party.
- **Authorised to Work On** means an approved person who has been assessed as competent against an approved training standard to perform electrical work on the network.

Barrier means a rope, tape, barricade, or alternative erected barrier in accordance with approved procedures for the purpose of issuing an access authority.

Bonded means connected together in such a manner as to ensure that all bonded parts are maintained at the same electrical potential.

Broad Supervision means a person has been advised by a person authorised to work on the network to enable them to avoid the dangers which electricity may create and is able to work without general or direct supervision.

Cable means an insulated conductor, or two or more such conductors, laid together, whether with or without fillings, reinforcements, or protective coverings.

Commissioned means electrical assets connected to the network and available for service.

Competent means the ability to perform particular tasks and duties to the standard of performance expected in the workplace. Competency requires the application of specified skills, knowledge, and attitudes relevant to effective participation for completing a task.

Competent Assistant means an assistant trained in rescue techniques relevant to the work being performed in de-energised situations or where the maximum slew radius of a mobile plant cannot encroach a

safe approach distance. Unlike a safety observer, a competent assistant can perform other tasks without suspending the work while maintaining regular visual and audible contact with the worker aloft.

Conductor means a wire, cable, bar, tube, or form of metal designed for carrying electric current.

Confined Space means an enclosed or partially enclosed space that:

- is not designed or intended primarily to be occupied by a person,
- is designed or intended to be, at normal atmospheric pressure while any person is in the space, and
- is or is likely to be a risk to health and safety from:
  - an atmosphere that does not have a safe oxygen level,
  - contaminants, including airborne gases, vapours, and dusts, that may cause injury from fire or explosion,
  - harmful concentrations of any airborne contaminants, or
  - engulfment.

Contractor means a company and its employees or an individual, engaged by Evoenergy but not on a basis of employment, to carry out work, or provide services, for Evoenergy as per the Contractor Management Manual.

Conversant means to be familiar with and have knowledge or experience of the facts or rules of something.

Covered Conductor means a conductor around which is applied a specified thickness of insulating material.

Covered Tool means a tool covered with insulating material that is designed and approved for use with insulated gloves and insulated barriers as appropriate to prevent inadvertent contact with energised conductors.

Danger – Do Not Operate Tag means a tag attached to the controls of an electrical apparatus to warn and prevent workers from inadvertent or unauthorised operation.

De-energised means not connected to any source of electrical supply but not necessarily isolated, earthed, discharged or out of commission.

Direct Supervision means that a person is under direct visual and audible contact with an appropriately authorised person while in the work area.

Discharged means having been connected to the general mass of earth in such a manner as to remove any residual electrical energy in a conductor or conducting object.

Disconnected – See Not Electrically Connected definition.

Earthed means the electrical connection of conductors and/or electrical apparatus connected directly to the general mass of earth to ensure and maintain the effective dissipation of electrical energy.

Earthing Device means an approved device used for the earthing of conductors and/or electrical apparatus.

Earth Potential Rise (EPR) means a voltage difference between a system earth and a reference point. EPR may cause hazardous voltages to appear on equipment and apparatus.

Earths

Operational Earth means approved earthing and short-circuiting equipment applied to apparatus, as a requirement for the issue of an electrical access authority, for the purpose of proving the electrical apparatus to be de-energised and earthed.

Note: All earths applied on the underground network between a point of supply and the worksite must be regarded as 'Operational Earths.'

- **Working Earth** means approved earthing and short-circuiting equipment applied to apparatus that is under an electrical access authority.

- **System Earth** means a permanent preinstalled and tested electrical conductor connected to the general mass of earth.
- **Earth Chain** means a form of trailing earth, consisting of a galvanised closed-link chain, minimum 16mm rings, welded to the mobile plant tray or chassis with a minimum length of 2100mm. The chain must be of sufficient length to enable a minimum of 300mm to make contact with the ground.

Easement means formal land access agreements primarily allowing Evoenergy access to sub transmission assets located on that land.

Effective Supervision, in relation to work, means being present at the worksite to the extent required (e.g., broad, general, or direct) to ensure that the work is being correctly performed and carried out in accordance with these Electrical Safety Rules.

Electrical Apparatus means any HV or LV electrical equipment, including overhead lines and underground cables, the conductors of which are energised or can be made energised.

Electricity Network means an interconnected system or transmission and/or distribution conductors and electrical apparatus (see Mains).

Electrical Operator means a worker deemed competent against an approved training standard who has written authorisation to carry out electrical operating work on HV and/or LV electrical apparatus.

Electrical Operating Work means work:

- involving the operation of switching devices, links or fuses other than on a service.
- providing access to the Electricity Network.
- proving electrical conductors and/or electrical apparatus is de-energised, and
- where earthing and bonding, locking, and/or tagging of electrical apparatus and erection of barriers and/or signs will be required.

Electrical Station means any location in which HV supply is switched, converted, controlled, or transformed, or in which any similar electrical apparatus or plant is installed. Stations more commonly referred to include:

- **Bulk Supply Station** means the station at which a HV customer purchases their electricity. Electricity can be purchased at any voltage. The electricity is metered and controlled within the station but not necessarily transformed. The electrical network and electrical apparatus beyond the bulk supply station may or may not be owned and/or operated by Evoenergy.
- **Distribution Substation** means a station in which electricity is controlled and transformed. The highest voltage in the station does not exceed 22,000V.
- **Distribution Switching Station** means a station in which electricity is controlled and possibly metered. The highest voltage in the station does not exceed 22,000V. For the purposes of these rules, the requirements of a substation apply to a switching station.
- **Zone Substation** means a station in which electricity is controlled metered and transformed. The highest voltage in the station exceeds 22,000V.
- **Zone Switching Station** means a station in which electricity is controlled and metered. The highest voltage in the station exceeds 22,000V. For the purposes of these rules the requirements of a zone substation apply to a zone switching station.

Electrical Work means:

- connecting the Evoenergy electricity network to electrical equipment or disconnecting Evoenergy electricity network from electrical equipment, and
- installing, removing, adding, testing, replacing, repairing, altering, or maintaining electrical equipment on the Evoenergy Network.

Electrical Worker means a worker who is qualified to work on or near energised electrical apparatus for specific work to which the qualification pertains.

Embedded Generating Unit means a generating unit that is connected directly to and/or operating in parallel with the distribution network that is, or can be, connected directly to the electricity network by means of an operating switch or switching device. The generating unit may include photovoltaic (PV) systems via

inverters, rotating machines, solar, thermal, and other renewable generation, such as wind power generation or fuel cells.

Emergency means the same as Urgent Circumstance as defined in the Utilities Act: - Circumstances in which it is necessary to protect:

- the integrity of the network or facility, or
- the health or safety of people, or
- public or private property, or
- the environment.

Energised means connected to a source of electrical supply, or subject to hazardous induced or capacitive voltages.

Energised HV Line Worker means a worker tested against an approved training standard who has written authorisation to carry out HV live line work using Glove and Barrier or Stick techniques on HV electrical apparatus.

Energised Work means all work performed on apparatus energised or capable of becoming energised without implementing the full protective practice of isolating, proving de-energised and earthing or bonding at the worksite.

Equipotential Bonding means electrical connections intended to bring exposed conductive parts or extraneous conductive parts to the same or approximately the same potential but not intended to carry current in normal service.

ESI means Electricity Supply Industry.

Evoenergy means Evoenergy ABN 76 670 568 688

Exposed Conductor means an electrical conductor, approach to which is not prevented by a barrier of rigid material or by insulation which is adequate under a relevant Australian Standard specification for the voltage concerned.

Extra Low Voltage (ELV) means a nominal voltage not exceeding 50 volts alternating current or 120 volts ripple-free direct current.

Fallen means dropped or come down from a higher place.

Fit for purpose means that the state of the apparatus in question is suitable for the specific purpose for which it is intended or specified.

Gas Insulated Switchgear (GIS) means a switch which relies on Sulphur Hexafluoride Gas (SF6) as the insulating medium.

General Supervision means a worker is in regular visual and audible contact with an appropriately authorised person who must inspect and assess the tasks being performed and provide instructions and directions to maintain a safe work area.

Glove and Barrier means a method of performing Energised HV Line work.

Hazard means a situation or thing that has the potential to harm a person.

High Voltage (HV) means a nominal voltage exceeding 1,000 volts alternating current or 1,500 volts direct current.

Immediately Available means the item is located within a few metres of the work and is available without any delay such as the time taken to open doors and/or remove securing straps, etc.

Insulated means separated from adjoining conducting material by a non-conducting substance which provides resistance to the passage of current, or to disruptive discharges through or over the surface of the substance at the operating voltage, and to mitigate the danger of shock or injurious leakage of current.

Insulated aerial service line means a dedicated radial aerial cable from a low voltage electricity network to a customer's network boundary/point of attachment which is suspended in open air with or without support structures.

Insulated contact means direct contact with energised conductors by means of tested insulating material or substance suitable for the applicable voltage level.

Insulated Stick means a stick of insulating material specifically designed, approved, and tested for use in physically bridging the distance between the worker and energised apparatus, between the energised apparatus and earth, between adjacent phases and to enable physical loads to be taken or tools to be applied to the stick (see Operating Stick).

Insulated Tool means a tool of insulating material specifically designed, approved, and tested for use with appropriate PPE as per *Personal Protective Clothing and Equipment (PPE) - PR4602*. (See also Covered Tool)

Isolated means disconnected from all possible sources of electricity supply by means which will prevent unintentional re-energisation of the electrical apparatus and which is assessed as a suitable step in the process of making safe for access to the electricity network.

Isolator means a device which, for reasons of safety, provides in the open position, breaks to the circuit of a length appropriate to the voltage and the insulating medium.

Low Voltage (LV) means a nominal voltage exceeding 50 volts alternating current or 120 volts ripple- free direct current but not exceeding 1000 volts alternating current or 1500 volts direct current.

Low Voltage Energised Work means any task within 500mm of exposed energised low voltage conductors and apparatus that requires a worker to use and install specialised insulated low voltage equipment while maintaining correct body positioning to avoid secondary points of contact.

Mains means a cable or conductor which has more than one service connected to it, excluding fused underground Tee'd Service Cables (see Electricity Network).

Main Switchboard means a switchboard from which the supply to the whole electrical installation can be controlled.

Mobile Plant means cranes, elevating work platforms, trucks (tipping) or similar plant, any equipment fitted with a jib or boom and any device capable of raising or lowering a load.

Note: When determining safe approach distances, mobile plant can only be considered as a vehicle when in the normal travelling mode and not in the working mode.

Must or must not is to be interpreted as 'mandatory.'

Near means a situation where there is a reasonable possibility of a person, either directly or through any conducting medium (for example via mobile plant or insufficiently insulated or covered tools or equipment), coming within the relevant safe approach distances.

Network Boundary in relation to low voltage installations, means the boundary between Evoenergy's Electricity Network and a customer's premises:

- at the point of attachment of an overhead service line to the customer's building or structure,
- at the point of entry of an underground service cable to the customer's building or structure, or
- as otherwise agreed in accordance with the Electricity Network Boundary Code if neither of the above apply.

Nominated Subcontractor means a subcontractor pre-selected by the principal on the basis of a separate tender to provide work specially nominated and defined in the contract documents, such as the supply and/or installation of specialised systems or components.

Not Electrically Connected means electrical apparatus disconnected from all sources of supply by the removal or absence of conductors, appropriate to the voltage and insulating medium and not able to be energised by electrical operating work and identified in accordance with approved procedures.

Operating Stick means a stick specifically designed, approved, and tested for carrying out operations on energised electrical apparatus (see Insulated Stick).

Ordinary Person means a person without sufficient training or experience to enable them to avoid the dangers which electrical apparatus may create.

Out of Commission means electrical apparatus that is deemed as Not Electrically Connected to the network and which meet ALL of the following criteria:

- Not available for service
- Operating Schematics and Data reflect the out of commission status
- Not under operational control of System Control.
- A commissioning process is required before it can be re-energised.

Out of Service Tag means a tag fitted to unserviceable or faulty tools, plant, and equipment to warn against inadvertent operation.

Overhead Line means any aerial conductor or exposed conductors with associated supports, insulators and other apparatus erected, or in the course of erection, for the purpose of the conveyance of electrical energy, excluding poles or supporting structures or anything in an electrical station.

Person in Control (PIC) means a person who is nominated, responsible for and in control of a worksite. This person must remain at the worksite for the duration of the work to ensure:

- The work is completed as per the safe work method statement and procedures, and
- All hazards are identified, specific controls are implemented, and these remain effective for the work.

Personal Protective Bond (PPB) means a bond to ensure all high voltage electrical apparatus or equipment being worked on is maintained at the same potential (e.g., a connection from the conductor to a point below a worker on a pole).

Personal Protective Equipment (PPE) means approved clothing, equipment, and/or substances, which when worn or correctly used, protect parts or all of the body from foreseeable risk of injury or disease at work or in the workplace.

Plant means machinery, equipment, appliances, containers, implements and tools, and includes all components or anything fitted or connected to any of those items (see also Mobile Plant).

Potential (Electrical) means a difference of electrical charge or a difference in voltage between two points.

Procedure means the documentation of a systematic series of actions (or activities) directed to achieve a desired result.

Reasonably Practicable means that which is, or was at a particular time, reasonably able to be done to ensure health and safety, taking into account and weighing up all relevant matters including:

- the likelihood of the hazard or the risk concerned occurring.
- the degree of harm that might result from the hazard or the risk.
- what the person concerned knows, or ought reasonably to know, about the hazard or risk, and ways of eliminating or minimising the risk.
- the availability and suitability of ways to eliminate or minimise the risk, and
- After assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.

Recipient means a suitably trained and appropriately authorised person to whom an access authority has been issued. The recipient is responsible for compliance with the access authority's requirements.

Representative means a licensed electrician or a person who has been granted permission by Evoenergy to accept a SCAP, other than employees or contractors of Evoenergy.

Reservations means a defined area surrounding sub-transmission infrastructure where activities are limited to protect people, the electricity network, and the environment. Reservations exist around all Evoenergy sub transmission assets.

Risk means the possibility that harm (death, injury, or illness) might occur when exposed to a hazard.

Safe Approach Distance means the minimum distance that must be maintained by a person, worker, vehicle, or mobile plant (including its load, controlling ropes and any other accessories) when approaching electrical apparatus other than for work in accordance with an access authority.

Safety Observer means a person with sufficient knowledge of the task being performed and competent for the duty of observing and warning against unsafe approach to electrical apparatus.

Service means a dedicated radial electrical apparatus running from the point of connection from Evoenergy's LV electricity network to the customer's network boundary (see Network Boundary).

Should is to be interpreted as 'advisory or discretionary.'

So Far As Is Reasonably Practicable (SFAIRP) means that management will consider the effort, time and cost associated with risk elimination or minimisation against the predicted benefit.

Spiking includes remotely controlled stabbing, spiking, and cutting of a cable to prove it is de-energised.

Spotter means a worker with line of sight who helps direct the operator with safe movement of mobile plant in the workplace but is not necessarily authorised to guide movement in proximity to overhead powerlines.

Statement of Condition of Apparatus and Plant (SCAP) means a declaration regarding the status of particular plant and/or apparatus connected to a private network, issued by an Evoenergy authorised person to a representative, other than employees or contractors of Evoenergy.

Supervised Worker means an ordinary person with technical knowledge or relevant experience to perform the task concerned under the effective supervision of an authorised person to enable them to avoid the dangers which electricity may create.

Supervisory Control and Data Acquisition (SCADA) means a system providing remote control of apparatus.

Supply means supply of electricity.

Switch means a device capable of making, carrying, and breaking currents under normal circuit conditions. It is also capable, in the open position, of satisfying the isolating requirement for an isolator.

System Control means the functional area within Evoenergy that is responsible for the operation and security of the electrical systems, and controls access to the HV and LV electrical networks and apparatus.

Tester in Charge means an authorised tester to whom a sanction for testing has been issued and is the worker responsible for compliance with the requirements of the sanction for testing.

Testing Device means an approved device to be used for testing on the Electricity Network.

Third Party means a business or undertaking that is not engaged by or contractually obligated to Evoenergy but is required to work on or near to the Evoenergy network.

Vehicle means a truck (non-tipping), car, utility, or other general-purpose conveyance used for the carriage of persons or goods (see also Mobile Plant).

Vicinity means working outside of the minimum approach distances of an Ordinary Person where it is unlikely that a person will, either directly or through any conducting medium (e.g., via mobile plant), come within the relevant Safe Approach Distances.

Within Reach means at such a distance that can be touched by any part of the body or clothing or with any conducting object or non-approved object held in the hand.

Worksite means a place where work is carried out for a business or undertaking and includes any place where a worker goes, or is likely to be, while at work.

Worker means a person who carries out work in any capacity for a person conducting a business or undertaking, including work as:

- an employee,
- a contractor or subcontractor,
- an employee of a contractor or subcontractor, or
- employees of a labour hire company who has been assigned to work in the person's business or undertaking.

Working Alone means any worker working or travelling for work purposes on their own and without regular interaction with other people because of time, location, and/or the nature of their work.

A person is considered to be alone when they are:

- on their own.
- cannot be seen or heard by another person.
- do not expect a visit from another person for some time, or
- in circumstances where emergency assistance is not immediately available if needed.

Written (or in Writing) means recorded on paper or in an electronic form that is capable of being represented, reproduced, or converted to writing.

2 Safe Approach Distances to Electrical Apparatus

2.1 Key Requirement

Workers must observe an appropriate safe approach distance when working, or operating vehicles or mobile plant, near electrical apparatus. Work in the vicinity of electrical apparatus must be carried out in a safe manner and control measures taken must be consistent with the risk and work performed.

2.2 General

Under the requirements of the Utilities (Management of Electricity Network Assets Code) Determination 2013, any person required to work upon or to come within any safe approach distances of an electricity network must be duly trained in the Electrical Safety Rules.

All such persons must be assessed as competent and clearly instructed as to their responsibilities and limits of working on or approaching the electricity network, before undertaking any work on or near the electricity network. A person who is not duly trained in the Electrical Safety Rules is an Ordinary Person.

The safe approach distances in these Electrical Safety Rules are based on an ‘exclusion zone’ principle. This defines an area around the electrical apparatus into which no part of the worker, mobile plant, or object (other than approved insulated or covered objects) may encroach unless done so under the control of an access authority or by approved energised procedures.

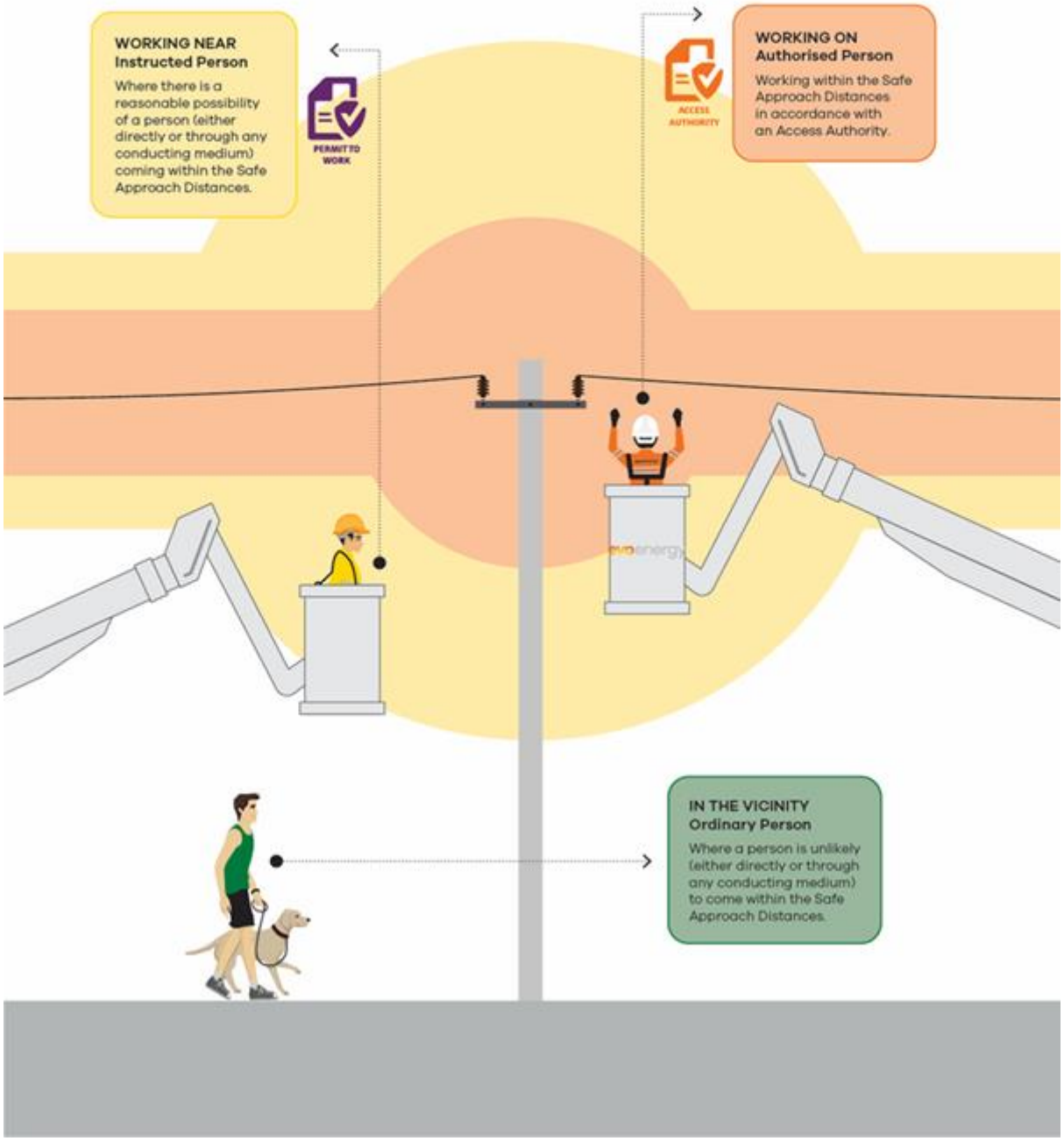
When working at these distances, appropriate controls must be implemented to ensure workers, mobile plant and unapproved objects do not encroach on the safe approach distances.

It is the responsibility of the person in control of the work to determine the applicability of the safe approach distances for particular work circumstances and, if considered appropriate, specify greater approach distances for the work.

Unnecessary approach to electrical apparatus must be avoided. The necessary approach to electrical apparatus must be kept to a minimum and must be restricted to the period required to perform the work.

Safe Approach Distance: People

Means the minimum distances which must be maintained by a person, when approaching conductors or electrical apparatus, other than for work in accordance with an Access Authority.



2.3 Safe Approach Distance – Persons

Safe approach distances for persons, means the minimum distances which must be maintained by a person when approaching conductors or electrical apparatus, other than for work in accordance with an Access Authority.

Table 2.1 Safe Approach Distances (mm) – Persons

Voltage Nominal phase to phase AC (kV)	Ordinary Person / Supervised Worker [1-4]	Authorised to Work Near [1-3]	Authorised to Work On [3]
LV – Aerial cables and aerial conductors[5]	1500	100	Insulated Contact
Insulated LV[6]	100	100	Insulated Contact
Earthed metallic screened HV – insulated conductor	100	Insulated Contact	
Unscreened HV insulated conductor – up to and including 66	2000	700[7]	
HV – up to and including 22	2000	700	
66	4000	1000	
132	4000	1500	

Notes

1. Deliberately avoid movements that could result in distances being infringed.
2. The distances specified are based on conductors not protected by a barrier of rigid material. For electrical apparatus protected by a barrier of rigid material the safe approach distance is the barrier itself (for example substation shell). Safe to touch tests and procedures must be applied at all times.
3. The distances specified are based on work from a stable surface. Appropriate allowance must be made for conductor sag and sway.
4. These figures are the minimum safe approach distance that must be used by ordinary persons.
5. Relates to all overhead mains conductors including Aerial Bundled Cable (ABC) also including communications, catenaries connected to LV neutrals.
6. Relates to insulated aerial service lines and low voltage underground cables attached to Evoenergy poles.
7. When operating electrical apparatus with approved tools the safe approach distance may be reduced to 300mm after the completion of a Risk Assessment and Job Safety Analysis.

2.3.1 Safe Approach Distance – Ordinary Persons and Supervised Workers

An Ordinary Person is a person without sufficient training or experience to enable them to avoid the dangers which electrical apparatus may create. The Safe Approach Distances for an Ordinary Person approaching insulated, covered, or exposed conductors is shown in Table 2.1.

Working outside of the minimum approach distances of an Ordinary Person is considered working in the vicinity. These are the distances beyond the reach of any part of the ordinary person's body or any conducting or unapproved object touching any part of the ordinary person's body. To maintain these minimum distances from overhead conductors, appropriate allowance must be made for sag and sway under a variety of conditions.

A 4m or greater approach distance applies in any direction where metallic scaffold is erected, used, or dismantled near overhead powerlines, where this is the case, all parties are required to refer to Evoenergy's Scaffolding and Guardrail System Work Near Overhead Powerlines procedure.

2.3.2 Safe Approach Distance – Authorised to work on or authorised to work near

An authorised person is a person with technical knowledge or sufficient experience who has been approved or has the delegated authority to act on behalf of the organisation, to perform the duty concerned. The Safe Approach Distances for an authorised person approaching insulated covered or exposed conductors are shown in Table 2.1.

2.3.3 Safe Approach Distance – Glove and Barrier electrical workers

Refer to Table 8.7 Safe Approach Distance (mm) To Energised Conductors for authorised HV Live Line Workers

2.4 Safe Approach Distance – Vegetation Clearing

2.4.1 Safe Approach Distance – Vegetation Clearing – General

The safe approach distances and vegetation clearance specified in this section apply to bare, covered, and insulated conductors.

The safe approach distances and vegetation clearances detailed in these safety rules are the minimum distances and must be applied by ordinary persons carrying out tree trimming and pruning, and authorised vegetation management workers performing vegetation management work.

Un-insulated tools, equipment and extensions are considered part of the person in applying Safe Approach Distances in this guideline. Insulated tools, equipment and extensions are also considered part of the person in applying safe approach distances to an 'Ordinary Person.'

To provide mechanical protection of the overhead line the distances indicated for insulated tools in the following tables of this section relate to cutting edge of the tool.

When utilizing insulated tools and equipment, the minimum length of insulating material between the operating head attachment and their closest point of contact must be equal to the personal safe approach distances in the following tables.

Persons in training performing vegetation management work near energised overhead lines, must work to the safe approach distances based on a site-specific job risk assessment. During training, instructed persons must be under the direct supervision of an authorised vegetation management worker.

Vegetation limbs must be considered as conductive objects when within the safe approach distances of HV conductors.

Before undertaking vegetation clearing activities, a job risk assessment must be conducted to assist in the identification and control of hazards to ensure that the work can be performed safely.

Issues that must be considered prior to commencing work:

- the suppression of auto-reclose.
- positioning any mobile plant in use such that the safe approach distance can be maintained in all circumstances.
- the use of safety observers, barriers, and signs.
- consideration of weather and environmental conditions (for example rain, wind, light, sag, or sway of conductors).
- movement of trees or other vegetation when cut.
- the use of insulated barriers, protective covers, and insulated equipment.
- de-energising the electrical apparatus, and
- isolating and earthing the electrical apparatus.

Subject to the outcome of a job risk assessment, vegetation below, but not contacting HV conductors, may be cut in accordance with vegetation clearances documented within these Electrical Safety Rules. Controls for managing the movement of limbs being cut must be assessed as appropriate and action taken as appropriate.

At no time must personal safe approach distances be reduced.

Vegetation above, adjacent and/or contacting energised HV conductors must only be cut by authorised HV Live Line Workers in accordance with 8.7 HV Live Line Work Safe Approach Distances

Vegetation contacting bare energised LV conductors may be cut only after a site-specific job risk assessment has been performed.

Vegetation overhanging LV conductors can be cut while the conductors remain energised provided the movement of limbs being cut can be controlled.

2.4.2 Ordinary Persons – Vegetation clearing

By definition within these electrical safety rules, Ordinary Persons are not considered as vegetation management workers.

Table 2.2 Safe Approach Distances (mm) and Vegetation Clearance (mm) for Ordinary Persons

Nominal Phase to Phase ac Voltage (V)	Person, Tools & Equipment (mm)	Mobile Plant (mm)	Cannot cut vegetation that is CLOSER than: (mm)
Covered LV	500	1000	500
Bare LV	1500	1000	1500
HV to 22kV	2000	3000	2000
22kV < 132kV	Must contact Evoenergy		

2.4.3 Safe Approach Distance – Vegetation clearing by authorised vegetation management workers

Authorised vegetation management workers performing vegetation clearing activities must apply safe approach distances and vegetation clearances as identified in Tables 2.3 and Table 2.4, applicable to their level of training and authorisation and the type of plant and equipment being used. Where an authorisation for vegetation management workers expires, see Ordinary Person.

authorised vegetation management workers are to refer to Clause 7.4.10 Permit to Work Issued to Non-Evoenergy Personnel and Clause 7.4.11 authorised Vegetation Management Workers Requiring the Isolation of Overhead Conductors, for guidance before performing vegetation cutting activities in the vicinity of Evoenergy electrical apparatus where it has been identified through a site-specific Job Risk Assessment that there is a reasonable possibility of a person, either directly or through any conducting medium (for example via mobile plant or insufficiently insulated or covered tools or equipment), coming within the relevant safe approach distances.

Authorised Vegetation Management Workers:

- are not to clear tree limbs overhanging HV conductors with the conductors energised, and
- are not permitted to clear vegetation from an elevating work platform positioned over the top of energised HV conductors.

Only appropriately Authorised High Voltage Live Workers are permitted to clear vegetation over the top of energised HV conductors.

Table 2.3 Safe Approach Distances (mm) authorised Vegetation Management Worker: Climber and Groundline

Climber and ground line Clearances Table		Using Insulated Tools/Equipment			Using Non-insulating Tools/equipment		
Voltage	**Personnel clearances**	**Insulated tool clearance**	**Vegetation clearances below/beside**	**Vegetation clearance above**	**Non-insulated tool clearances**	**Vegetation clearance below/beside**	**Vegetation clearance above**
LV Covered	500	300	No clearance required		500	No clearance required	
LV Bare	1000	300	100	Not Permitted	1000	1000	Not Permitted
11kV	1200	700	700* 1200**		1200	1200	
22kV	1200	700	700* 1200**		1200	1200	
66kV	1500	1000	1500		1500	1500	

- * Applicable for Ground Line only
- ** Applicable for Climbers

Table 2.4 Safe Approach Distances (mm) authorised Vegetation Management Worker from MEWP

Insulated MEWP Clearance table		Insulated Mobile Plant Clearance	Using Insulated Tools/Equipment			Using Non-insulating Tools/equipment		
Voltage	**Personnel clearances**		**Insulated tool clearance**	**Vegetation clearances below/beside**	**Vegetation clearance above**	**Non-insulated tool clearances**	**Vegetation clearance below/beside**	**Vegetation clearance above**
LV Covered	500	Physical clearance (no contact)	300	No clearance required		500	No clearance required	
LV Bare	1000		300			1000	1000	Not Permitted
11kV	1200	700	700	700	Not Permitted	1200	1200	
22kV	1200	700	700	700		1200	1200	
66kV	1500	1000	1000	1000		1500	1500	

2.4.4 Close Approach Vegetation Control

An Accredited PCBU that has safe systems of work in place to support Close Approach Vegetation Control (CAVC), may apply the minimum vegetation clearances listed in Table 2.5 when authorised vegetation management workers have successfully completed an RTO endorsed CAVC course.

Note: During CAVC, suppression of auto reclose is a mandatory requirement.

A person in control of the work must determine the applicability of the safe approach distances and vegetation clearances described in 2.5 for particular worksite conditions and circumstances, and if considered appropriate, specify greater approach and vegetation clearances for the work.

The maximum nominal circuit voltage where close approach vegetation control can be undertaken is 66kV.

There are up to six levels of protection used during close approach vegetation control:

- worker uses appropriately insulated tools.
- There is a sufficient air gap between the vegetation and energised overhead lines.
- worker maintains sufficient air gap between their body, the plant and tools being used and energised overhead lines.
- a safety observer monitors the work to confirm the required air gaps and work practices are being maintained by the worker, and
- for work carried out aloft, the worker works from an appropriately insulated MEWP
- The CAVC workers must NOT commence CAVC work adjacent to HV conductors unless clearance has been provided directly from System Control.

Insulated tools used for close approach vegetation control

Close approach vegetation control must only be carried out using tools insulated for the highest nominal voltage of any circuit in the work area.

All insulating fibreglass tube sections must comply with IEC 60855 – Insulating foam-filled tubes and solid rods for energised working. Materials used in the handle must have the same mechanical properties as those required by IEC 60855 – Insulating foam-filled tubes and solid rods and must be made of the same material as the insulating section.

All insulating fibreglass tube sections must be marked with all the following information:

- manufacturer's name or trademark.
- relevant voltage rating (phase to phase highest system voltage), and
- an identifying number, either engraved or indelibly written, on a securely attached label.

The minimum length of the insulating section must be based on the Safe Approach Distances for workers and relevant system voltage, as prescribed in Table 2.3, 2.4, and 2.5.

Uninsulated sections of handles must be clearly indicated by placement of a hand guard and by unambiguous labelling.

The surface of all insulating sections must be clean and dry, free of cracks, scratches, surface damage or mechanical defects that could impair the insulating qualities. Minor surface damage, such as light scratches, is acceptable. Any foam filled sections must be sealed at the end to prevent water ingress.

All hydraulic hose sections must comply with IEC 62237 – Energised working – Insulating hoses with fittings for use with hydraulic tools and equipment.

All insulating hydraulic hose sections must be marked:

- non-conductive, and
- with an identifying number, either engraved or indelibly written, on a securely attached label.

If the high voltage insulated tool has been tested previously it will have a test sticker or label indicating the date of last test and date next due. This sticker or label must not be removed.

The surface of all insulating hydraulic hose sections must be clean and dry and free of surface damage or mechanical defects that will impair the insulating qualities.

Insulated tools must be visually inspected and electrically tested before going into initial service.

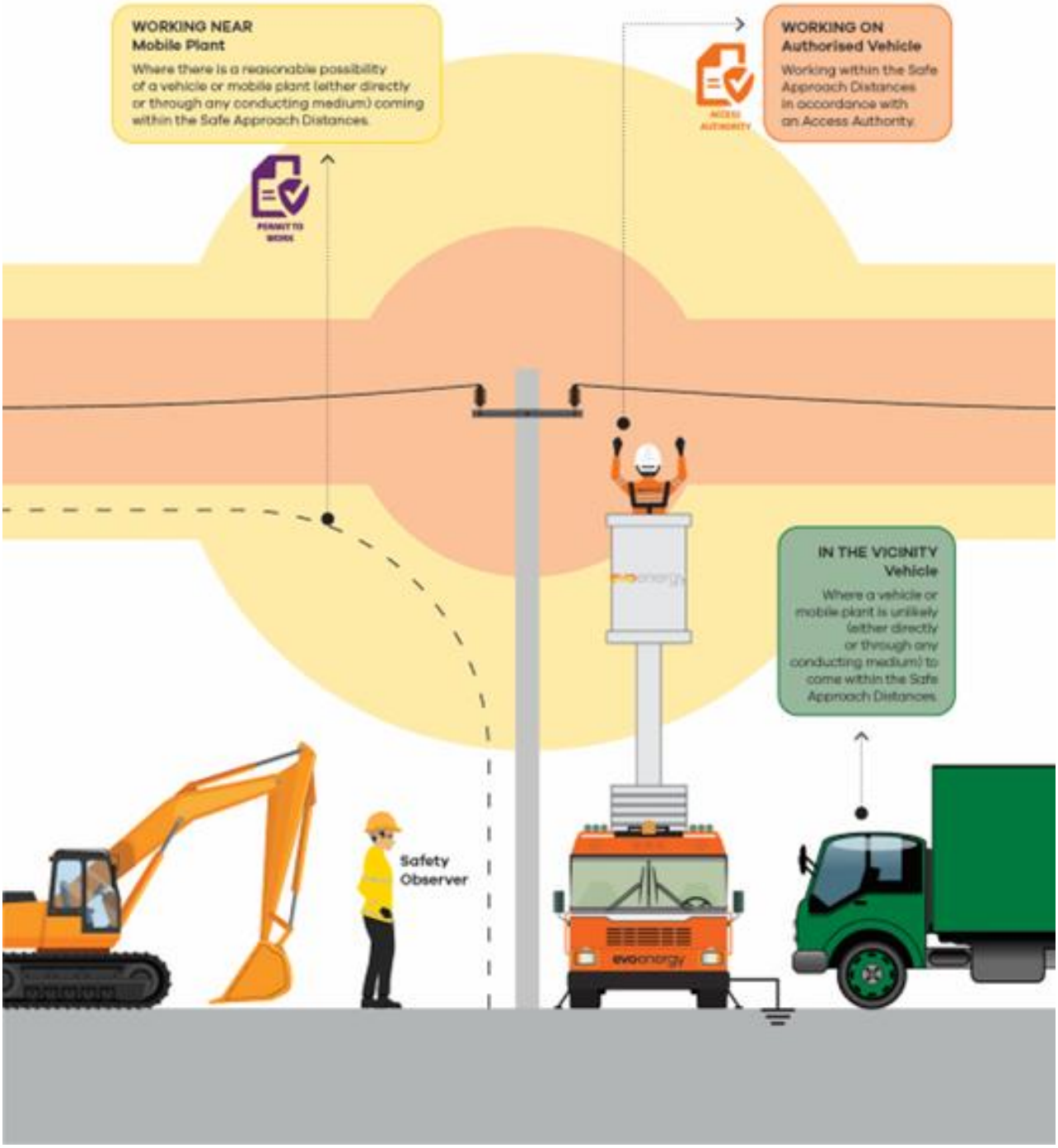
Insulated tools must be wiped clean and inspected for defects before each use.

TABLE 2.5 Minimum Approach Distances (MM) And Vegetation Clearances (mm) for Close Approach Vegetation Control (CAVC)

Nominal voltage	Personnel clearance MEWP, ground line & climber	Insulated mobile plant clearance MEWP only	Insulated tools clearance MEWP, ground line & climber	Vegetation clearance below / beside Note: Only authorised HV glove and barrier or stick line workers are permitted to clear vegetation over the top of energised HV conductors			
				EWP and GL		Climber	
				Clearance and outage required	Suppression of auto-reclose	Clearance and outage required	Suppression of auto-reclose
LV covered	500	Physical clearance (No contact)	300	None required, unless determined by risk assessment	Not Applicable	None required, unless determined by risk assessment	Not Applicable
LV bare	1000						
11kV	1200	700	300	≤100	>100 and <700	700	>700 and <1200
22kV	1200	700	300	≤150	>150 and <700	700	>700 and <1200
66kV	1500	1000	300	≤400	>400 and <1000	1000	>1000 and <1500

Safe Approach Distance: Mobile Plant

Means the minimum distance that must be maintained by a vehicle or mobile plant when approaching conductors or electrical apparatus other than for work in accordance with an access authority.



2.5 Safe Approach Distances (mm) for Vehicles and Mobile Plant

The safe approach distances for vehicles specified in Table 2.6 are based on their design or transit envelope and do not allow any part of the vehicle to come closer than the specified safe approach distance. This includes the load, exhaust pipe and attachments like rotating and flashing lights or radio aerials.

Note: A person working from within the basket of a MEWP must adhere to the Safe Approach Distances documented in Table 2.1.

Table 2.6 Safe Approach Distance (MM) To Overhead Energised Conductors for Vehicles And Mobile Plant

Voltage Nominal phase to phase AC	Vehicle		Mobile plant		
	Ordinary Person / Supervised worker	Authorised Person Notes 1-3	Ordinary person / Supervised Worker	Authorised Person Notes 1-3	
				Uninsulated	Insulated
LV	600	600	1000	1000	CONTACT
HV – up to and including 22kV	900	700	3000	1200	700
66kV	2100	1000	3000	1400	1000
132kV	2100	1200	3000	1800	1800

Notes

1. The distances specified are based on work from a stable surface. Appropriate allowance must be made for conductor sag and sway and for uncontrolled movement of vehicle or plant due to any reason.
2. A safety observer is required.
3. Any part of the covered pole must remain at least 300mm clear of any energised, covered HV conductor/s, allowing for sag and sway of the conductors, as the pole is being erected.

An appropriate Job Risk Assessment must be undertaken before work is performed.

2.5.1 Ordinary Persons in Vehicles

An ordinary person in control of any vehicle, excepting mobile plant when in working mode, must ensure that no part of the vehicle or its load is placed or moved within the distances shown in Table 2.6 – Safe Approach Distance (mm) to Overhead Energised Conductors for Vehicles and Mobile Plant.

2.5.2 Authorised Person in Vehicles

Authorised persons in control of any vehicle, excepting mobile plant when in working mode, must ensure that no part of the vehicle or its load is placed or moved within the distances shown in Table 2.6 – Safe Approach Distance (mm) to Overhead Energised Conductors for Vehicles and Mobile Plant.

2.5.3 Use of Mobile Plant

Mobile plant must only be used in the vicinity of energised conductors and/or electrical apparatus after precautions appropriate to the particular circumstances have been considered and action taken to control the associated hazards and risks.

Authorised Persons operating mobile plant must ensure their equipment and load do not approach closer than distances in Table 2.6, unless in accordance with an Access Authority.

System Control must be notified where Mobile Plant will be operating inside electrical stations in accordance with the Work Request procedure.

When working under HV live work procedures, refer to Table 8.7 Safe Approach Distance (mm) To Energised Conductors for Authorised Energised HV Line Worker.

When mobile plant is operated in working mode in the vicinity of energised electrical apparatus, the possibility of inadvertent contact with energised conductors must be considered during the planning and execution of the work.

The control measures to be considered within a job risk assessment must include:

- isolating and earthing electrical apparatus.
- Set up the mobile plant in a position that keeps the design envelope outside the safe approach distance.
- mechanical stops or interlocking the motion of the mobile plant to prevent it from being moved within the safe approach distance.
- the use of safety observers, barriers, and signs.
- The use of other precautions such as physical restrictions or control devices with barriers.
- the suppression of auto-reclose, and
- de-energising the conductors and/or electrical apparatus.

When mobile plant may be working near energised electrical apparatus, the mobile plant must be earthed or suitably barricaded to prevent step touch potential contact. This must be achieved by an approved earthing conductor directly connected to a system earth or other approved earthing system, refer to Clause 6.2 Earthing Hierarchy.

Mobile plant and, where appropriate, vehicles, must be earthed by a trailing earthing conductor to protect against the hazards presented by induced voltages, refer to Clause 11.4 Work in Electrical Stations – General Working Practices.

When mobile plant is operated from outside the mobile plant, precautions must be taken to protect the operator from hazardous step and touch potentials. No worker other than the mobile plant operator must touch the mobile plant whilst in operation.

Where mobile plant (e.g., EWP) is not fully insulated, the insulation level of each part must be labelled in accordance with AS1418.10.

Suspended loads must be controlled by means of dry fibre rope (tag line) or other approved insulating medium. Neither the mobile plant nor conductive winch rope/load must be touched by any worker while the mobile plant or any conducting object attached is in motion.

During operation of the mobile plant, only ground-level workers involved in the work associated with it must be near the plant. All other workers must remain clear.

2.5.4 Testing of Mobile Plant

Mobile plant must be used in accordance with Tools, Equipment Testing and Inspection. Each elevating work platform vehicle used in the vicinity of overhead lines must be subjected to an approved HV electrical test on its insulated boom section/s at intervals not exceeding six months or more frequently depending on usage and work environment.

The vehicle must not be accepted as suitable for use in the vicinity of energised overhead conductors unless it is within its test date.

2.6 Urgent Circumstances

In urgent circumstances where there is a likely risk of electric shock to workers or the public from electrical conductors or electrical apparatus, such as fallen conductors and/or from contact voltages on conductive structures for example fences, prompt action must be taken to ensure people are kept well clear of the hazard at greater than safe approach distances.

All electrical apparatus and conductors must be considered energised until proven de-energised by approved means.

Initially for fallen or exposed electrical conductors a safety clearance of 8m for HV/LV conductors or 2m for LV only conductors must be maintained. Fallen conductors once proven de-energised must have an operational earth applied in the case of HV, while LV conductors must have bonders applied until repairs can be made.

Reduced safe approach distances must only be applied after System Control (via the electrical operator) has confirmed that the conductors will remain de-energised.

Workers must remain on site to issue oral warnings to any worker or members of the public making unsafe approach to fallen or exposed electrical conductors and/or access may be controlled using barriers or signs for example rope, ribbon, portable flashing lamps, switches hats or other appropriate means.

2.7 Contact with Energised HV Conductors by means of Appliances

Only approved tested appliances are permitted to be brought within the safe approach distance or into direct contact with energised HV conductors.

Manufacturer supplied operating equipment (for example Magnefix MD4 operating handle), or approved earthing devices can be used as intended within the safe approach distance, refer to Table 2.1 Safe Approach Distances – Persons.

2.8 Handling Objects/Loads

When objects are being handled manually or by mechanical equipment, care must be exercised to prevent the objects or the mechanical equipment from infringing safe approach distances.

For manual handling, appropriate work methods and an appropriate number of workers must be used to maintain safe approach distances.

For mechanical handling where there is a risk of infringing the safe approach distances to electrical conductors, refer to Table 2.1 Safe Approach Distance (mm) Persons. The movement of loads must be controlled by means of approved non-conducting ropes of minimum length to safely perform the task.

No worker outside the cabin of the mobile plant must directly contact the load, mobile plant, or any attached conducting objects. For protection of the mobile plant operator, refer to Clause 2.5.3 Use of Mobile Plant.

Approved lifting devices used as pole mounted lifting equipment, for example rope tackles and handlines, may be attached to pole structures by a line worker or suitably trained worker. Workers must maintain the clearances in Table 2.1 Safe Approach Distance (mm) for Persons, between exposed energised conductors and any part of the lifting device, gear, and load at all times.

2.9 Work On or Near Energised Electrical Apparatus

Energised work should only be undertaken after first performing a switching needs assessment to determine whether the work should be done under isolated conditions or whether the work can be performed under energised conditions by appropriately trained, skilled and authorised persons.

When work is to be performed on or near energised low voltage electrical apparatus, System Control must be advised prior to the work in accordance with the **Recording of Live Work On or Near the LV Distribution Network** procedure.

When work is to be carried out on or near energised low voltage electrical apparatus, approved precautions or energised working techniques must be undertaken in accordance with the **Energised Low Voltage Works Manual** to prevent simultaneous contact with conductors or conducting objects at different potential unless all conductors are de-energised.

When energised HV access is required to work on or near the Evoenergy electricity network including live HV tree clearing and work on underground services near HV cables, System Control must be advised prior to the work in accordance with the **Live HV Network Access** procedure.

3 Training and Authorisation

3.1 Key Requirement

Persons working on or near electrical apparatus connected to the Evoenergy network must have training relevant to these electrical safety rules and authorisation for the duty to be performed.

3.2 Core Training Matrix

Evoenergy has duties under the Work Health and Safety Act to ensure that information, training, and instruction provided to a worker is suitable and adequate for working on, near or in the vicinity of the Evoenergy Network.

The Core Training Matrix has been developed to define the minimum training requirements for Evoenergy workers. It is the responsibility of workers, and their managers, to ensure workers meet these requirements.

The Core Training Matrix must be reviewed every 36 months at a minimum.

3.3 Qualifications for Work On Electrical Apparatus

A person must not carry out work to which these rules apply, and the person must not be permitted or required to carry out such work, unless:

- The person is undertaking a relevant apprenticeship or has received training which is appropriate for the type of work concerned and is assessed as competent.
- The person is physically fit to safely perform the required work, and
- The person has successfully attained and is current in an approved course which meets the requirements of the Core Training matrix as applicable to the work being performed.

Persons qualified to work on overhead or underground electrical apparatus can perform the work provided that they:

- possess a relevant certification issued by a Registered Training Organisation, or recognised issuing body, or Evoenergy, or
- are undertaking work for which they have been authorised. For example, HV Live Line work is only performed by an authorised person.

Persons are qualified to work as an Electrical Supply Industry Electrical Fitter, Cable Jointer, or Line Worker for overhead or underground line work if they:

- Have successfully completed a nationally recognised Certificate within the UET Transmission, Distribution and Rail Sector Training Package, or
- Hold previous qualifications or certification as an Electrical Fitter, Cable Jointer or Line Worker for overhead or underground line work or equivalent, which are recognised by Evoenergy, and
- Are authorised to work on the Evoenergy network in accordance with the Evoenergy authorisation framework.

3.4 Withdrawal and/or Restriction of an Authorisation

Evoenergy reserves the right to stop, review, restrict or suspend work or authorisations at any time. An authorisation may be withdrawn, restricted, suspended, altered, or reviewed when it is apparent that the worker concerned:

- should no longer be authorised or has an expired authorisation,
- requires additional training or is assessed as not yet competent, or
- has been or is unable to perform activities within the scope of the authorisation due to any circumstance,
- Is subject to, or as the outcome of an investigation.

3.5 Authorisations Framework

3.5.1 Authorised to Work On the network

Authorised to Work On means an approved person who has been assessed as competent against an approved training standard to perform electrical work on the network.

This authorisation is only assigned to workers engaged by Evoenergy and Evoenergy nominated contractors.

A person authorised to work on the network has successfully completed the following training to enable authorisation in accordance with Table 3.1:

- Evoenergy Electrical Safety Rules
- Low voltage testing of connections
- Provide First Aid
- Provide CPR
- Rescue training relevant to the nature of the work as defined within the Core Training Matrix.

A person authorised to work on the network can perform the following tasks:

- sign onto and receive an electrical access permit.
- sign onto and receive a permit to work.
- Sign onto a sanction for testing under the direct supervision of an authorised Tester in Charge.
- Conduct low voltage testing of connections.

- Work to the safe approach distances of a person authorised to work on.
- Perform the role of safety observer – energised work/mobile plant.
- Enter Electrical Stations.

Authorisations for Working on the network must be approved by Work Practices.

3.5.2 Authorised to Work Near

Authorised Near means a person who is not an electrically qualified worker but has enough technical knowledge and experience to do non-electrical work that involves being near electric lines and has been approved by Evoenergy to work near electric lines.

This authorisation is only assigned to workers and contractors engaged by Evoenergy.

Note: Crane and Scaffold workers engaged by Evoenergy who are authorised to Work Near are restricted to working in the vicinity of energised apparatus on the Evoenergy network and work sites controlled by an electrical access authority.

The following list is not exhaustive but provides examples of roles that may require an authorisation to work near to the network.

- Operational Supervisor/Managers,
- Technical Officers,
- Asset Managers and Engineers,
- Asset Inspectors, and
- Non-Trade Field Workers

A person authorised to work near has successfully completed the following training:

- Evoenergy Electrical Safety Rules training.
- UET Work safely in the vicinity of live electrical apparatus as a non-electrical worker.
- First Aid and CPR.
- Rescue training relevant to the nature of the work and /or as defined within the Core Training Matrix.

A person authorised to work near to the network can perform the following tasks:

- Sign onto an Access Authority and perform tasks within their technical skill set, qualifications, and licensing under the effective supervision of a Recipient.
- Receive a Permit to Work.
- Perform the role of safety observer – mobile plant.

Authorisations for Working Near to the network must be approved by Work Practices.

3.5.3 Supervised Worker

A Supervised Worker is not an authorisation to work on or near the network. Supervised network access is usually undertaken for a short term and typically relates to a single project or task where it is not usually suitable to issue an authorisation.

Supervised Worker means an Ordinary Person effectively supervised by an authorised person to enable them to avoid the dangers which electricity may create. Where effective supervision is not provided to Supervised Workers, they become Ordinary Persons.

Under the requirements of the Utilities (Management of Electricity Network Assets Code) Determination 2013, any person required to work upon or to come within any safe approach distances of the Evoenergy electricity network must be duly trained in the Electrical Safety Rules. Subsequently, a Supervised Worker must maintain the safe approach distances of an Ordinary Person to energised apparatus at all times and Supervised Workers must be identified as such to those responsible for their supervision.

Examples of a Supervised Worker include:

- A plumber or carpenter performing minor repairs at a zone substation.
- A subject matter expert engaged to undertake a singular specialised activity at an Evoenergy controlled site.

- A non-authorised visitor to an electrical station, e.g., an authorised person accompanying an auditor.
- A member of the public performing non-network activities adjacent to the network under the control of a Permit to Work.

A Supervised Worker can sign onto an Access Permit and a Permit to Work to perform work within their training and qualifications under the effective supervision of an appropriately authorised person.

3.5.4 Authorised Tester in Charge

Application of test voltages >2500V must require a Sanction for Testing unless the apparatus is 'out of commission' or the service conductors are less than or equal to 50mm2 and not requiring isolation of LV mains.

Workers permitted to receive a Sanction for Testing must be an authorised Tester in Charge. An authorised Tester in Charge is a worker who has the practical and theoretical knowledge to carry out required tests in accordance with the High Voltage Cables and Apparatus Testing Manual where a sanction for testing has been issued. The Tester in Charge is responsible for compliance with the requirements of the Sanction for Testing.

Prior to being authorised as the Tester in Charge, a worker must:

- Complete the Issue/Receive Access Authority (Sanction for Test) approved training standard and be deemed competent to be a Tester in Charge and receive sanction for testing permits, and
- Complete refresher training in accordance with the Evoenergy Core Training Matrix for Issue/Receive Access Authority (Sanction for Test).

Authorisations for Evoenergy employees to become an authorised Tester in Charge must be approved by Work Practices.

Any authorisations for engaged contractors to become authorised Tester in Charge must be approved by the General Manager Evoenergy. Evidence must be provided with the application to the General Manager to support the approval process.

3.5.5 Authorised Electrical Operators

Switching and associated duties on electrical apparatus must only be performed by electrical operators whose authorisation, training, duties, and instructions cover the particular electrical apparatus. All such switching must be completed using an approved switching plan or under the instruction of System Control.

Prior to being authorised as a LV and/or HV electrical operator on the Evoenergy Network, a worker must:

- Maintain an authorisation to work on the network (unrestricted).
- Have demonstrated a sound knowledge of the Evoenergy Electrical Network.
- Have completed an approved training course through an external Registered Training Organisation (RTO) and been deemed competent.
- Have completed all other pre-requisites as required by Evoenergy, i.e., electrical operator logbook, theory tests.
- Have received local instruction and satisfied an approved assessor as to acquired knowledge and ability within the scope of the authorisation.

There are three (3) level of switching authorisation for Electrical Operators:

- Low Voltage Switching
- HV Switching
- Zone Substation Switching

Employee switching authorisations are valid for a maximum of 12 months. To renew switching authorisations, a Verification of Competency (VOC) must be carried out by an Evoenergy approved verifier every 12 months. Where multiple switching authorisations are held by an individual operator, as a minimum, one VOC must be conducted for each authorisation per calendar year e.g., Low Voltage year 1, High Voltage year 2, and Substations in year 3.

The VOC framework and VOC record keeping is managed by Electrical Work Practices.

Authorisation must be issued by System Control, which must designate the types of authorisations applicable and must be approved by the System Operations Manager.

3.5.5.1 Emergency switching coordinated by System Control

Any worker with appropriate skills may perform switching operations in the following circumstances:

- when specifically instructed by, or authorised by System Control, or
- in an emergency involving serious risk to workers, the public or property, refer Clause 2.6 Urgent Circumstances.

After any such emergency switching, System Control must be notified as soon as possible. Disconnected electrical apparatus must not be reconnected without instruction from System Control.

3.5.6 Authorised High Voltage Live Worker

Persons who work on Energised High Voltage overhead lines must:

- Have achieved competence in the applicable nationally recognised Live Line "Units of Competency" from the Maintain energised HV distribution overhead electrical apparatus (glove) Training Package delivered by a Registered Training Organisation, or
- Hold previous or alternative Units of Competency for live line work recognised by Evoenergy.
- Maintain an authorisation to work on the network (unrestricted).

Authorisations for High Voltage Live Work must be issued by System Control and signed off by the Manager System Control.

Note: In addition to the above qualifications and training, persons must not carry out high voltage live line work unless they hold a current live line authorisation issued by Evoenergy

3.5.7 Authorised to Enter Electrical Stations

An Authorisation to enter Electrical Stations is issued to persons engaged by Evoenergy who are required to access electrical stations to perform single or multiple tasks which are repeated at one or more sites. This may include:

- Project Managers, Engineers, and Network Controllers for the purpose of audits and inspections.
- Maintenance personnel who perform cleaning, gardening maintenance, minor building service maintenance utilising hand tools only, minor non-electrical repairs within zone and chamber type substations.
- SCADA works in Zone Substations that does not require lifting/disconnecting of links or connections.
- Fire equipment inspectors who conduct regular inspections of extinguishers

An authorisation for Electrical Station Entry does not overrule any other authorisation requirements relating to work i.e., authorised to Work On or Near. Persons who hold an authorisation for electrical station entry may not hold any other authorisation type. This means their functional role when entering electrical stations is limited to visual inspections and/or audits or non-electrical work in the vicinity of electrical apparatus.

Where contractors have been authorised to enter electrical stations, it is the responsibility of the contractor manager to induct the authorised person(s) to all relevant electrical station sites to enable them to avoid the dangers which electricity may create.

Note: Safe Approach Distances do not apply to equipment that is enclosed, and the front enclosure is at earth potential, e.g., RMU switch gear at an indoor substation.

A person authorised to Enter Electrical Stations is a person who has been assessed as competent against the *Electrical Station Entry and Awareness training.*

Authorisations for Electrical Station Entry must be approved by Work Practices.

3.6 Evoenergy Contractors

A worker is anyone who carries out work in any capacity for Evoenergy, including employees, contractors, subcontractors, apprentices, and trainees. Contractors and their subcontractors engaged by Evoenergy to work on or near the network must be authorised in accordance with the Evoenergy authorisation framework.

3.7 Third Party Authorisations

Third Parties are businesses or undertakings that are not engaged by or contractually obligated to perform work for or on behalf of Evoenergy but are required to work on or near to the Evoenergy network. Third Parties are required to register with Evoenergy to authorise their workers to work near to the network.

Third party authorisations are managed according to the following four categories:

1. Civil Works – Non-destructive digging and powered excavation
2. Shared Asset on Poles – Streetlighting and Communication
3. Network Boundary Authorisation
4. Vegetation Management Workers

Third Party workers are authorised to work near to the network in accordance with these electrical safety rules to perform the functions outlined within the authorisation. A Third-Party authorisation allows an authorised worker to come within the safe approach distances of an ordinary person, but not beyond the safe approach distances of a person authorised to work near.

Third party authorisations must be managed by the registered PCBU. Application forms, certificates, training transcripts and other forms of valid evidence must be electronically stored in the Evoenergy authorisation database. Authorisations last for 12 months after the successful completion of the training requirements. Authorisations are approved by Work Practices.

Authorised third party workers can receive and sign onto a Permit to Work in accordance with Clause 7.4.

Work conducted in the vicinity of the Evoenergy overhead and underground network and outside the scope of the above-mentioned authorisations must be conducted in accordance with the *Safe Work Australia General Guide for Working in The Vicinity of Overhead and Underground Electric Lines*.

3.7.1 Civil works – Non-destructive and powered excavation

The Civil Works authorisation is for third party workers who are required to excavate up to the minimum approach distances of an authorised person to energised underground cables in accordance with Section 5 when working on or near underground cables and TABLE 5.2 Minimum Approach Distance (mm) for Excavation Around Energised Underground Cables.

A Civil Works authorisation allows a person to perform the role of safety observer/spotter for an authorised person conducting non-destructive and powered excavation near to Evoenergy's underground cables.

A Civil Works authorisation does not allow mobile plant to come within the Safe Approach Distances of an Ordinary Person to energised overhead conductors.

Workers authorised to excavate closer than the minimum approach distances documented for an Ordinary Person must be trained in the requirements of the ***Evoenergy Electrical Safety Rules***.

To obtain a Civil Works authorisation, an applicants must have successfully completed the following training:

- Work safely in the vicinity of live electrical apparatus as a non-electrical worker.
- Electrical Safety Rules training.
- Provide cardiopulmonary resuscitation.
- Provide first aid.

3.7.2 Shared assets on structures authorisation

All applications by third parties who have third party assets located on Evoenergy structures must meet the requirements of the ***Evoenergy Electrical Safety Rules.***

The PCBU must be an accredited service provider of the shared asset owner. It is the responsibility of the PCBU to ensure that all workers required to work near to the Evoenergy network are authorised.

Shared Asset authorisations are only provided to employees, contractors, and subcontractors of a PCBU working under a facilities agreement developed in consultation with Evoenergy. Examples include NBN, TPG and TCCS.

3.7.3 Shared assets authorisation – Communication

The authorisation for working on third party communication assets located on Evoenergy poles allows an authorised person to come within the safe approach distance of an Ordinary Person but not beyond the safe approach distance of a person authorised to work On or Near.

For a person to be authorised, the registered business making the application must provide evidence of engagement by the joint use partner (on the asset owners company letterhead) verifying their status as an accredited service provider of the Asset Owner.

The applicant must have successfully completed the following training to enable the authorisation:

- Provide cardiopulmonary resuscitation.
- Provide first aid.
- Work safely in the vicinity of live electrical apparatus as a non-electrical worker.
- Electrical Safety Rules training.
- Rescue training relevant to the nature of the work e.g. Pole top rescue.

3.7.4 Shared assets authorisation – Streetlighting

For a person to be authorised, the registered business making the application must provide evidence of engagement by the joint use partner (on the asset owners company letterhead) verifying their status as an accredited service provider of the Asset Owner.

The applicant must have successfully completed the following training to enable the authorisation:

- Certificate III in ESI - Distribution Overhead (No network boundary established).
- Certificate III Electrician – AS3000 side of network boundary.
- Electrical Safety Rules training.
- Provide cardiopulmonary resuscitation.
- Provide first aid.
- Rescue training relevant to the nature of the work e.g. Pole top rescue and/or Perform rescue from a live low voltage panel for access to Evoenergy substations (collocated assets).

Access to Evoenergy substations where Evoenergy and TCCS assets are co-located must be conducted in accordance with the ***Recording of Live Work On or Near the LV Distribution Network***.

3.7.5 Network boundary authorisation

The Network Boundary authorisation enables a licensed electrician in the ACT (Australian Capital Territory) to:

- Insert and/or remove service fuses (where the Service Protection Device has been previously installed) at the network boundary for single premises, and/or
- terminate consumer mains cables at the network boundary of single premise installations where a Point of Entry (POE) meets current Evoenergy S&I rules, has been installed and service fuses have been removed to de-energise the consumer side (not including Point of Attachment style network boundaries), and/or
- applying for an Evoenergy key to access metering or isolation locations in multi tenanted installations.

Note: Only National Electricity Market Accredited Metering Providers can authorise their representatives for Evoenergy metering key access.

A Network Boundary authorisation does not allow a worker to:

- Replace a low voltage service fuse that has been removed by Evoenergy or any other third party.
- Alter, remove, or relocate Evoenergy's overhead LV service line or LV pillar connections.
- Access Evoenergy Substations and other assets.
- Climb or work aloft on Evoenergy poles or electricity assets.
- De-energise a premise for purposes other than consumer-initiated works or meter replacements
- Not act in accordance with consumer or regulatory rules/laws, including but not limited to, customer outage notification requirements, access notification requirements etc.

Prior to receiving a Network Boundary authorisation, an electrician with an ACT Electrical Licence (unrestricted), must have successfully completed the ***Evoenergy Electrical Safety Rules training*** and the ***Evoenergy Service and Installation Rules training***.

3.7.6 Vegetation management worker accreditation and authorisation

Vegetation management work performed near the Evoenergy network in the ACT must be conducted by authorised vegetation management workers who are employed by an accredited service provider.

A PCBU must prepare SWMS for working near to the network and provide a Certificate of Currency for Public Liability Insurance of not less than $20 million and a Certificate of Currency for Worker's Compensation.

Accreditation is at the discretion of the Evoenergy Vegetation and Inspection Manager. Vegetation management workers must be assessed in accordance with the ***Evoenergy Electrical Safety Rules.***

- Vegetation Management Workers authorised to clear vegetation from aerial lines under Section 41D Utilities (Technical Regulation) Act 2014 require evidence for the attainment for the Certificate III in Arboriculture.
- Vegetation Management Workers authorised to clear vegetation from aerial lines within urban leased land (urban backyards) who are engaged by the lease holder require evidence for the attainment for the Certificate II in ESI - Powerline Vegetation Control as a minimum.
- Vegetation Management Workers who have been authorised by their employer to perform Close Approach Vegetation Control must provide a Certificate of Completion from an RTO and maintain prescribed refresher training.

To maintain accreditation, the PCBU must ensure that new or reviewed documentation is loaded to the company profile prior to the document's expiry date. Vegetation Management Worker authorisations must be managed by the PCBU who must maintain accreditation and authorisation requirements in the company and worker profiles in Beakon.

Table 3.1 Frequency of Assessment – Training

Training	Frequency	Ref. Clause
Evoenergy Electrical Safety Rules	12 months	All
Provide First Aid	3 years	4.9
Provide CPR	12 months	4.9
Field Switching Verification of Competency (VOC)	12 months	3.5.5
Maintain energised HV distribution overhead electrical apparatus (stick)	12 months	8.6
Maintain energised HV distribution overhead electrical apparatus (glove)	12 months	8.6
Enter and work in confined spaces	3 years	4.4
Perform rescue from an energised LV panel	12 months	4.7, 4.16
Perform pole top rescue	12 months	4.7, 4.16
Perform EWP rescue	12 months	4.7, 4.16
Perform MEWP controlled descent escape	12 months	4.7, 4.16
Perform rescue from switchyard structures at heights	12 months	4.7, 4.16
Perform tower rescue	12 months	4.7, 4.16
Work safely at heights	12 months	4.7, 4.16

Testing of connections to LV electricity networks	12 months	10
Electrical Station Entry and Awareness	12 months	11.2
Sanction For Test	12 months	7.3
Evoenergy Service and Installation Rules	12 months	3.7.5

4 General Safety Requirements

4.1 Key Requirement

Consideration must be given to providing additional procedures for matters identified to ensure a comprehensive safe working environment. If a safety issue is recognized, that is not controlled through an existing procedure, then an appropriate procedure should be prepared to maintain a safe working environment.

4.2 Apprentice Supervision

Persons in training, electrical workers and their supervisors must refer to **Apprentice Training Management Procedure** for specific detail about undertaking work to which these rules apply.

In broad terms:

- Apprentices must not be placed in a position to perform rescue operations from live electrical apparatus until they are deemed competent to perform the rescue and are familiar with the requirements of these rules and working with live electrical apparatus.
- The level of supervision for an apprentice must be based on the persons perceived level of competency to safely perform the work not their time served, and
- Apprentices must not undertake work to which these rules apply without an appropriate level of supervision as prescribed in the **Apprentice Training Management Procedure**.

4.3 Communications – Network Access

All communications relating to the operation of, or access to, electrical apparatus must be clear and definite in accordance with Network Access. Electrical apparatus must be referred to by name and sufficient detail to give positive identification including location. Verbal instructions and statements must be clearly defined and for switching and access authorities they must be confirmed by repeating back to avoid misunderstanding. Guidance can be found in the following procedures:

- Work Request Procedure
- Network Switching
- Recording Of Live Work On or Near the LV Distribution Network
- Live HV Network Access

4.4 Confined Spaces

All workers required to enter and work in confined spaces must hold the following competencies: Enter and Work in Confined Spaces.

All workers who enter confined spaces must follow the Confined Space Assessment and Entry procedure in conjunction with the Confined Space and Contaminated Atmosphere Safe Work Method Statement (SWMS).

All identified confined spaces must have a clearly marked sign, and entry must be in accordance with the Confined Space Assessment and Entry procedure.

4.5 Danger of Materials Which Can Conduct Electricity

All materials, including liquids and gases must be regarded as conducting materials unless there is definite knowledge to the contrary. It should be noted that:

- earth, concrete, wet, or damp timber are conducting materials.
- Flames conduct electricity and care must be exercised when using flame-producing equipment. Blow lamps are liable, under certain circumstances, to throw a long stream of flame and liquid.

- steel tapes, metal reinforced tapes or rulers must not be used near exposed electrical apparatus (some fabric tapes are metal reinforced). Only non-conductive tapes or non-conductive rulers must be used near energised electrical apparatus.
- metal objects, such as radio telephone units with telescopic aerials, mobile phones, torches, and the like must be handled with care when working on or near exposed electrical apparatus.
- The wearing or carrying of personal metal effects such as jewelry, watches, keys, cigarette packets with conductive wrapping, etc., constitutes a hazard when working on or near energised electrical apparatus. As per Personal Protective Clothing and Equipment (PPCE), such effects must be removed by the worker and care taken to ensure that metal objects do not fall from pockets.
- the liquids of certain fire extinguishers are conductive. Only carbon dioxide, or dry chemical powder fire extinguishers should be used on fires on or near energised electrical apparatus, and

Vehicle tyres, although made of rubber, contain a high percentage of carbon and other conducting materials, and therefore must be regarded as conductors of electricity.

4.6 Danger Tags

'Danger – Do Not Operate' tags must:

- be attached to the controls of operable electrical apparatus to warn workers against inadvertent or unauthorised operation (that would endanger the safety of Workers and persons or the reliability and quality of supply) unless attachment to the controls is impractical in which case danger tags must be attached in the next best locations to affect the warning.
- only be installed, altered, or removed by appropriately authorised persons, and
- also be fitted to unserviceable equipment to warn against inadvertent energisation or operation. Danger tags must be clearly labelled with contact name, phone number, date, and details of why the tag has been applied, for example work request number, description of fault, etc. Danger Tags must be securely attached to the equipment.

Danger tags must be clearly labelled with contact name, phone number, date, and details of why the tag has been applied, for example work request number, description of fault, etc.

Danger Tags must be securely attached to the equipment.

Workers must not remove or alter any tags applied without consulting System Control or the worker who attached the tag. Danger tags which have been installed by the electrical operator must only be removed by an electrical operator under the direction of System Control (refer Lock Out Tag Out Procedure).

Figure 1. Example of 'Danger – Do Not Operate Tag'

4.7 Emergency Rescue Kits

Emergency rescue kits are utilised to help in the rescue of workers from poles, towers, elevating work platforms, LV busbars, LV switchboards or confined spaces.

Emergency rescue kits must be in test date, in fit for use condition and immediately available when workers are to work on or near electrical apparatus, when working at heights or in confined spaces.

4.8 Fire Extinguishers

An approved fire extinguisher, size and type depending on the task, must be available for use in an incident.

4.9 First aid and CPR

All persons who are required to perform work as an authorised person must be given appropriate first aid and CPR training, conducted at intervals in accordance with Table 3.1 Frequency of Assessment – Training and Authorisations. An approved first aid kit must be carried in each vehicle and be available for use in the event of an incident in accordance with the ***First Aid in the Workplace*** procedure.

4.10 Fit For Work

Fit for work means that, as an individual, you must be in a physical, mental, and emotional state that will allow you to perform assigned tasks to standards set by the company and in a manner that will not put yourself or others' safety or health at risk.

Supervisors, individuals, and work colleagues are responsible for ensuring that all workers are fit and safe for work while at work.

Alcohol, drugs, prescription medication, fatigue, mental alertness, and physical condition of a worker may impede a worker's ability to work safely including the use of vehicles, plant, and equipment.

Workers must not consume or be under the influence of alcohol or drugs during work hours and may be subject to testing as per **Drugs and Alcohol Procedure**.

Workers working for long or extended periods are at risk of fatigue which can diminish a person's ability to perform work tasks safely. No worker must work for periods of time that will breach Fatigue Prevention Procedure.

4.11 Hazard Identification, Job Risk Assessment and Control

Prior to the commencement of any work associated with Evoenergy worksites, the workers conducting the work must identify the hazards, assess the risk, control identified hazards and maintain situational awareness throughout the work activity.

All workers must participate in a worksite specific job risk assessment process that utilises the hierarchy of controls and must include:

- identifying all hazards.
- assessing the risk associated with each hazard.
- eliminating or controlling the hazard.
- monitoring and reviewing the effectiveness of controls, and
- ensuring a written record of the assessment is completed.

4.12 High Voltage (HV) Operating Sticks

HV operating sticks must have a length which provides appropriate insulation from energised parts and enables the worker using the stick to maintain the applicable safe approach distance. Always Refer to Section 2 Safe Approach Distances to Electrical Apparatus.

When an operating stick rated for the voltage concerned is to be used in wet conditions or on voltages 66kV or 132kV, consideration must be given to the potential for hazardous surface leakage currents. The operating stick must have a minimum of three extensions when used for voltages of 66kV or 132kV.

4.13 Insulated Sticks

Insulated sticks must have a length which provides appropriate insulation from energised parts and enables the worker using the stick to maintain the applicable safe approach distance at all times.

When an insulating stick is to be used in wet conditions consideration must be given to the potential for hazardous surface leakage currents.

Only persons authorised to Work On the network or persons trained in the use of insulating sticks must use insulating sticks on live electrical apparatus.

4.14 Labelling Of Electrical Apparatus

For the purposes of identification and description, electrical apparatus must, wherever reasonably practicable, be clearly labelled in accordance with the **Apparatus Terminology, Labelling and Allocation of Identification Numbers Manual.**

4.15 Portable Ladders

Conductive portable ladders (including wire-reinforced) must not be used at any time on Evoenergy property or at other times on, near or in the vicinity of electrical apparatus or conductors. Before ascending an approved ladder, the worker must make sure the ladder is secure in accordance with the fall protection guidelines within the **Risk of falls over 2 metres SWMS**.

4.16 Perform Rescue

A person conducting a business or undertaking must ensure that electrical work on energised electrical equipment is carried out with a safety observer present who must be competent –

- to implement control measures in an emergency, and

- to rescue and resuscitate the worker who is carrying out the work, and
- The safety observer must have been assessed in the previous 12 months as competent to rescue and resuscitate a person.

Before conducting a rescue on or near energised exposed conductors the rescuer must consider all hazards and methods to control the hazards to ensure that the rescue can be performed safely. Such controls may include de-energisation of the circuit, the use of insulated sticks and maintaining safe approach distances during the rescue.

Perform rescue instruction must be conducted for workers working on the Evoenergy electricity network appropriate to the job family being performed at intervals in accordance with Table 3.1 Frequency of Assessment – Training and Authorisations, for the following:

- pole top rescue.
- elevating work platform (EWP) rescue.
- tower rescue.
- switchyard structures at heights rescue.
- energised LV panel rescue, and
- EWP controlled descent escape.

4.17 Personal Protective Clothing and Equipment

A PCBU must ensure that Personal Protective Clothing (PPC) provided to workers complies with the requirements of the Personal Protective Clothing and Equipment (PPCE) Manual.

Evoenergy workers, contractors and authorised third party workers must wear personal protective equipment which gives appropriate protection to the eyes, head, body, arms, hands, legs, and feet in accordance with AS/NZS 4501.1 Occupational protective clothing – Guidelines on the selection, use, care, and maintenance of protective clothing.

A PCBU must ensure that Personal Protective Equipment (PPE) provided to workers required to work on or near energised apparatus is selected, used, and maintained in accordance with the ENA NENS 09 National Guideline for the Selection, Use and Maintenance of Personal Protective Equipment for Electric Arc Hazards.

4.18 Possibility of Leakage Currents on Poles

Electrical workers working on poles carrying energised conductors must be aware of the possibility of electric shock from pole steps or other unearthed metal which may become energised because of leakage currents.

Poles must be approached with reference to the Low Voltage Cable and Apparatus Testing Manual and the Instructions for Safe to Climb Test.

Where there is any indication that such conditions exist, poles must not be climbed until the matter has been escalated to the immediate supervisor and appropriate action has been taken to deal with these conditions.

4.19 Portable Electric Tools and Equipment

Portable electric tools and equipment, including generators, inverters and extension leads, must be approved, used, repaired, and tested as detailed in **Tools, Equipment Testing and Inspection** procedure.

- No portable tools must be directly connected to mains or busbars.
- All electrical hand tools must be used in conjunction with residual current devices (RCD) protection, either portable or fixed.
- Double insulated or battery-operated tools must be used in preference to single insulated tools

4.20 Rail Corridors

Approval must be obtained from the appropriate Rail Authority before any operational, maintenance, inspection, construction, commissioning, decommissioning or alteration activities can be carried out within the rail corridor or have the potential to encroach on the rail corridor.

4.20.1 Light rail

Light rail enquiries must be directed through Evoenergy – Canberra Metro Operating Protocol.

Canberra Metro defines the hazard area as "two (2) metres from the nearest rail up to three (3) metres in height, and three (3) metres from the nearest rail above this height. Where there is more than one (1) track, the area between the tracks is also considered to be within the Hazard Zone", and a permit to work must be required if:

- any work where any part of the worksite, any tools or material, plant or machinery, a suspended load, or any person (who is performing work), could come within the Hazard Zone.
- any work which will force pedestrians to be diverted into the Hazard Zone.
- piling, using a crane, excavation over 2m deep, or erecting and dismantling scaffolding, within 6m of the edge of the Hazard Zone.
- any excavation within 3m of any pole supporting overhead wires (including those assets outside of the Hazard Zone).
- any work of any kind within 3m of a pole supporting overhead wires.
- any work where vehicles fitted with cranes, tipping bodies or skip loaders will come within the Hazard Zone when this equipment is in use.
- any work of any kind that may produce smoke, dust or gas in a confined area requiring inhibition of the fire alarm system, and/or
- work within the Hazard Zone or an electrical exclusion zone

4.20.2 Heavy rail

Heavy rail access to perform third party works must be directed through the UGL Regional Linx. Online application form for John Holland Rail NSW Rail Corridor Link to form is https://uglregionallinx.powerappsportals.com/

A rail corridor is defined in the Country Regional Network (CRN) Rules and Procedures as ‘the land on which a railway is built. comprising all property between property fences, or if no fences, everywhere within 15m from the outermost rails.’

Workers must have a Rail Industry Corridor Induction which provides participants with the knowledge, training, and skills to effectively work safely in and around the rail corridor. The training details how to take appropriate safety precautions to access the danger zone, access the rail corridor and how to respond appropriately in an emergency.

https://edge.sitecorecloud.io/cimicgroupl634d-cimicxmcloud-production-16eb/media/project/cimic/countryregionalnetwork/page-documents-and-assets/external--accessing-the-country-regional-network.pdf

4.21 Safe Design of Structures

Safe design means the integration of control measures early in the design process to eliminate or, if this is not reasonably practicable, minimise risks to health and safety throughout the life of the structure being designed.

The safe design of a structure will always be part of a wider set of design objectives, including practicability, aesthetics, cost, and functionality. These sometimes-competing objectives need to be balanced in a manner that, so far as is reasonably practicable, does not compromise the health and safety of those who work on or use the structure throughout their life.

4.22 Storage of Materials

When work is being carried out in an area containing exposed electrical apparatus, any materials stored in such areas must be kept well away from the exposed electrical apparatus. Care must also be taken to ensure that materials are not placed in positions where they may block doorways, obstruct the passage of persons and workers, or hinder the carrying out of normal operations or work on the electrical apparatus.

4.23 Stored Energy

Equipment prepared for work which is capable of storing some form of energy, such as circuit breaker operating mechanisms, must be fully discharged or otherwise disabled in a manner approved prior to work commencing unless otherwise specifically requested by the workers.

Gas cylinders must be transported and secured upright to prevent rocking.

Where capacitors or capacitive charge may exist, work must not commence until the equipment has been isolated, earthed, and short-circuited and the equipment should be regarded as energised until discharged.

4.24 Use of Safety Observers

4.24.1 Energised work general

Unless working in accordance with Clause 4.25 or undertaking Electrical Operator tasks, a Safety Observer must be appointed in accordance with the ***Live High Voltage Manual*** and the ***Energised Low Voltage Manual***, or it is considered after a JRA that a person might inadvertently infringe the Safe Approach Distances.

Under no circumstances must the Safety Observer be diverted to another task while the possibility of infringing the Safe Approach Distances exists, however the Safety Observer may perform limited duties related to the work being performed e.g., tying a service to hand line or monitoring and managing the Drop Zone. Where this need may arise, effective communication must be maintained between the Safety Observer and the worker being observed.

Before any person can act as a Safety Observer for workers in proximity of energised electrical apparatus, they must:

- Be trained and competent in the task being observed and the relevant rescue techniques in accordance with Clause 4.16 Perform a Rescue,
- Understand the work process and sequence of work,
- Have the authority to temporarily suspend the relevant work at any time e.g., when a Safety Observer performs a duty related to the work being performed,
- Understand the workplace hazards applicable,
- Be positioned to effectively observe and immediately communicate with persons performing the work, and
- Monitor the work and warn against potential infringement of Safe Approach Distances.

4.24.2 Mobile plant

Where it is considered that a worker, equipment, or mobile plant might inadvertently infringe safe approach distances, a safety observer must be posted. A Safety Observer Zone is the area where machinery or equipment is operating and where any part of the machinery or equipment COULD encroach the nominated Safe Approach Distance.

Under no circumstances must the safety observer be diverted to another task while the possibility of infringing the safe approach distance exists, however the Safety Observer may perform limited duties related to the work being performed e.g., monitoring and managing the Exclusion Zone. Where this need may arise, effective communication must be maintained between the Safety Observer and the plant operator.

Before any worker can act as a safety observer of mobile plant in the vicinity to electrical apparatus, they must:

- Be a worker trained in the Evoenergy Electrical Safety Rules and competent in Safe Approach Distances.
- Understand the task, work process and sequence of work.
- Have the authority to temporarily suspend the relevant work at any time.
- Understand the workplace hazards applicable.
- Be positioned to effectively observe and immediately communicate with persons operating Mobile Plant.
- Monitor the task and warn against potential infringement of Safe Approach Distances.

For work on energised equipment refer to the Live High Voltage Manual and the Energised Low Voltage Manual.

4.24.3 Use of a competent assistant

In de-energised situations the use of a competent assistant is an acceptable alternative to a safety observer. A competent assistant must be trained in rescue techniques relevant to the work being performed. Unlike a safety observer, a competent assistant can perform other tasks without suspending the work while maintaining regular visual and audible contact with the worker.

4.24.4 Apprentices used as Safety Observers

Fourth year apprentices may be used as a safety observer if they have sufficient knowledge and experience in the task being performed.

Apprentices previously deemed competent with relevant industry experience and current competency maintain the ability to perform the role of spotter/safety observer from year 1.

4.25 Working Alone or Without a Safety Observer

A job safety analysis may determine that appropriate hazard control measures can be implemented in accordance with procedures so that work can be carried out safely without a safety observer in the following circumstances.

4.25.1 Work no more than two metres from the ground

The following work may be undertaken by an appropriately authorised person, without a safety observer, on or near the network providing a worksite specific JRA is undertaken, the work is conducted in accordance with approved SWMS and the workers feet are no more than two (2) meters from the ground:

- Electrical operating work.
- testing and fault finding.
- cable locating work.
- asset and vegetation inspections.
- metering work, and
- working on switchboards or cubicles where energised conductors are encapsulated in terminals that prevent inadvertent contact between different potentials.

Nothing in Clause 4.25 prevents the use of a safety observer being in attendance when deemed necessary through the job risk assessment or SWMS to perform the work safely.

4.26 Work In the Vicinity of Electric and Magnetic Fields

Most RF fields found in the environment are due to commercial radio and TV broadcasting, and from telecommunications facilities (such as mobile phone base stations). RF exposure from telecommunications facilities is generally less than from radio or TV broadcasting.

Relatively high levels of exposure to RF fields can occur to workers in the broadcasting, transport and communications industries when they work in close proximity to RF transmitting antennas and radar systems.

Workers accessing structures that house base station antennas must consult with building and facility management before entering the site. A guide to working safely near mobile phone base stations is available at https://www.radioworksafe.com.au/

Exposure to RF reduces very rapidly with distance so although we may be exposed to RF from various sources (such as smart meters, mobile base stations, and other wireless communication transmitters), it is close proximity to a particular source (e.g., when using a mobile phone) that will typically dominate the exposure. Measurement surveys have shown that exposure to RF radiation in the environment from various sources is very low and typically much lower than the allowable limit for safety in the Australian RF Standard.

4.27 Work on Poles

Before ascending a pole, the workers must satisfy themselves that the pole is in a safe condition for climbing. A person with management or control of a worksite must ensure that poles are tested as safe to climb in accordance with the **Instructions for Safe to Climb Test**.

Care is required in the climbing of poles or posts that are the property of others for example temporary service posts. These must not be climbed without first testing in accordance with Instructions for Safe to Climb Test.

Under no circumstances must a pole be subjected to a sudden load change whilst a worker is aloft. When working at heights on poles, the worker must not support themselves on pins, insulators, brackets, crossarms or conductors. The worker must always remain attached in accordance with the **Risk of falls over 2m SWMS**.

Training and assessment intervals related to work on poles will be conducted in accordance with Table 3.1 Frequency of Assessment – Training and Authorisations.

4.28 Work Safely at Heights – Prevention of Falls

Workers who access, egress from, transfer between and work at heights on poles, lattice structures, substation equipment and related structures, must maintain attachment at all times in accordance with the **Risk of falls over 2m SWMS**.

Fall prevention principles are based on a hierarchy of controls. The selection of appropriate fall arrest equipment must be based on identification of the hazards associated with access to, egress from, transfer between or work and the assessment of the risk of restrained fall, limited free fall or free fall.

5 Guidance when Working On or Near Underground Cables

5.1 Key Requirement

This chapter provides guidance on safe excavation practices and the minimum approach distances for excavation around energised underground cables.

5.2 Work on Underground Network, Service or Supervisory (SCADA) Cables

All underground cables and associated electrical apparatus must be regarded as energised until tested de-energised and earthed. Until proven de-energised, minimum approach distances when excavating must be observed as per Table 5.2 Minimum approach distance (mm) for excavation around energised underground cables.

Cables must be identified AND proven de-energised by testing or spiking prior to access.

Excavation practices on or near to the Evoenergy network must be conducted in accordance with these Electrical Safety Rules and the **Evoenergy Civil Works Manual**.

Note: New cables may have a residual charge from testing in the factory, capacitance from onsite insulation resistance testing, or induction from proximity to energised lines, and must be discharged prior to work being performed on them.

5.3 Excavation in the Vicinity of Overhead Powerlines

Before starting work, it is essential to identify the height and voltage of the overhead powerlines and if applicable, assess the foreseeable horizontal safety clearances at the site. Figure 2 shows the distances that must be assessed for each site.

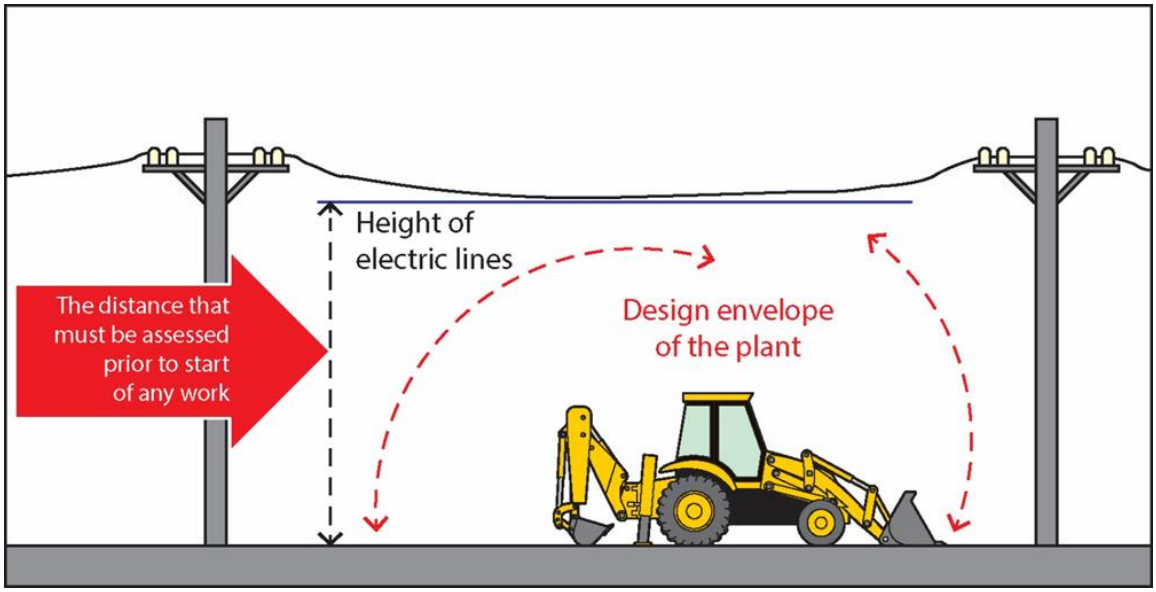
As distances increase, estimating them without equipment can be difficult. It may be necessary to allow greater clearance distances or use more accurate ways to estimate distances. An ultrasonic cable height indicator provides a safe and accurate way of estimating distances near overhead powerlines.

If the height or voltage of the overhead powerlines cannot be accurately estimated, then consult with Evoenergy for advice.

Do not attempt to directly measure the height of overhead electric lines. Do not use conductive metallic objects or measuring devices such as a metal tape measure for estimating the height of overhead electric lines.

Overhead powerlines are made of metal and expand or contract when heated or cooled. This can be caused by changes in ambient air temperatures and electrical load current passing through conductors.

Figure 2. Design Envelope of Mobile Plant



Where more than one voltage is present the approach distance for each voltage should be maintained. For example, where overhead powerlines have two or more circuits operating at different voltages and both are supported on the same pole.

The person in charge of the work should determine the applicability of the Safe Approach Distances described in these electrical safety rules for particular work circumstances and, if considered appropriate, specify greater approach distances for the work.

A mobile plant operator performing excavation works must not come within the Safe Approach Distances of an Ordinary Person to energised overhead conductors. Refer to Table 2.5. Safe Approach Distances for Vehicles and Mobile Plant

The installation of visual indicators (tiger tails, mats, and/or flags) by an Evoenergy authorised person can alert workers and operators to hazards when estimating approach distances. This may be useful for temporary work sites that are sectioned off from the public and have specific entry points.

5.4 Excavation in the Vicinity of Evoenergy Structures

A person must not, without reasonable excuse cut away, excavate, or remove any earth or material supporting or covering an electricity network facility in a way that is likely to damage the facility or endanger its safe or efficient operation.

Table 5.1 provides the **NO DIG ZONES** around Evoenergy structures and the distances applicable to structure types. Permission from Evoenergy must be obtained to excavate within the **NO DIG ZONES** as described in Table 5.1 (reference *Utility Networks (Public Safety) Regulation 2001*).

Table 5. 1 NO DIG ZONES FROM STRUCTURES (mm)

Structure type	Depth of excavation	Within distance from structure
Any wall, fence or foundation of a substation that forms part of an electricity network facility	300	600
Pole supporting an aerial line (refer Figure 4).	900	600
Any pole, or stay anchorage, to which is attached a stay wire used for the support of a pole	1800	3000
Tower supporting an aerial line[1]	300	1500

	900mm	15000mm

Note 1: Refer to Clause 5.6 Excavation within sub transmission reservations

5.4.1 Excavations that pass near poles or stays

Excavations that pass near poles and pole stays are not to be closer than as illustrated without gaining permission from Evoenergy. A person with management or control of a worksite must use Non-Destructive Digging techniques to locate any cables and earths that run from the pole. Seek engineering consultation if the excavation must enter the **NO DIG ZONE**.

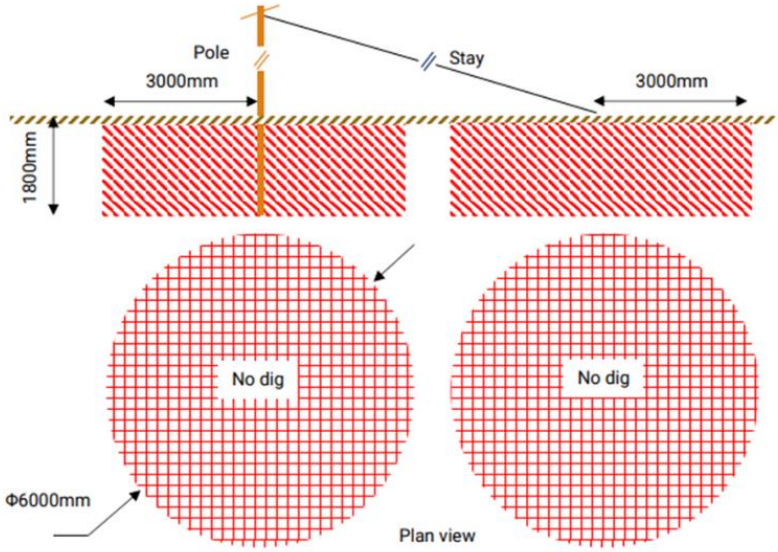
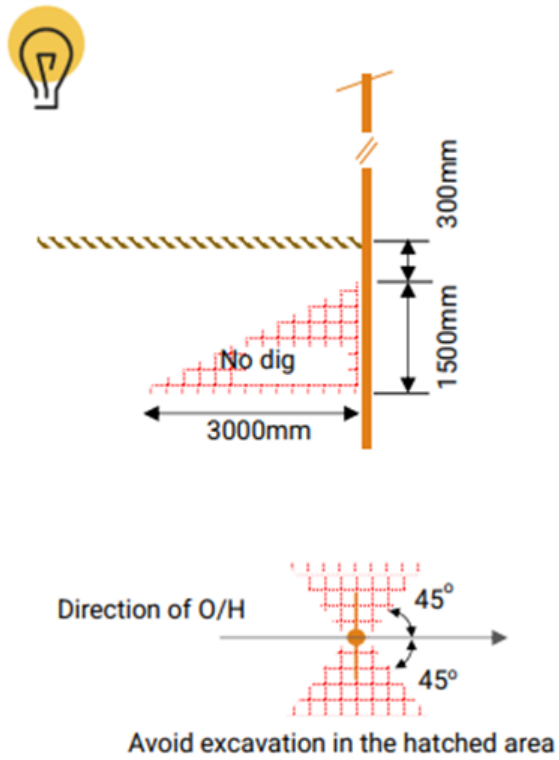


Figure 3. Excavations that pass near poles or stays

5.4.2 Excavating to a pole

- Where possible locate cables to the opposite side of oncoming traffic.
- Where possible on termination poles, the cable should come up on the conductor side and opposite any stays.
- Excessive excavation at the pole base may disturb the pole foundation.
- Provide stabilisation if required
- Provide polymeric covers.
- Check for earth cables on the pole or existing cables, use positive asset location practices to mark and identify their locations.
- Seek engineering consultation if you need to enter the NO DIG ZONE.
- Ensure cable bend radius is not compromised.



5.4.3 Excavating near padmount and switching stations

A PCBU must get permission from Evoenergy to excavate deeper than 300mm within the one (1) metre **NO DIG ZONE** of a padmount substation. Powered excavation is not permitted within one (1) metre of the padmount substation.

Damaged or broken earth wires and stakes may pose a severe electrical shock risk and must not be physically broken or damaged. Non-destructive digging or potholing must be used to identify the grading ring locations. Grading rings surround Padmount and switching substations.

If broken or damaged, call the Evoenergy emergency contact **13 10 93** immediately and remain clear until assistance arrives.

5.5 Excavation in the Vicinity of Live Cables

For excavation work near to the energised low voltage underground network, System Control must be notified in accordance with the ***Recording of Live Work On or Near the LV Distribution Network*** procedure.

For excavation work near HV cables up to and including 22kV, Evoenergy must be notified in accordance with the ***Live HV Access*** procedure.

Underground assets must be identified using location services and positive asset identification before any excavation can proceed.

Cables known to be close to the worksite must be exposed (potholed) by Non-Destructive Digging (NDD) techniques (e.g., hand or hydro vacuum excavation) to verify their location. Hydro Vacuum Excavation to pothole and expose energised underground cables is only permitted for energised cables up to and including 22 kV.

When excavating around energised cables, minimum approach distances must be maintained in accordance with TABLE 5.2 Minimum Approach Distance (mm) For Excavation Around Energised Underground Cables.

Before excavating parallel to existing cables, the cables must be uncovered at bends, joints and every 10-15 metres along trench line.

Note: Excavation inside of Zone Sub Stations or 132kV Switching Station earth grids and fenced boundaries must be planned at the design stage and not be physically performed until a specific excavation job risk assessment has been performed and signed off by the relevant electrical engineer.

5.6 Excavation Within Sub Transmission Reservations

Sub transmission easements and reservations are corridors of land set aside for overhead and electrical infrastructure operating at voltages of 66kV and above. In the Evoenergy network, sub transmission cables and conductors typically carry 132kV. There are restrictions on developments and activities that are allowed to take place within a sub transmission easement / reservation, these restrictions are designed to manage:

- Risks to public safety.
- Risk to electricity network assets.
- Risks to supply of electricity to customers.
- Risks to the environment.

All persons who intend to undertake activities in sub transmission reservations must comply with the Evoenergy ***Requirements for Work and Other Activities Within Sub Transmission Reservations*** procedure.

5.7 Exposing of Cables Through Non-Destructive Digging and Powered Excavation

Table 5. 2 MINIMUM APPROACH DISTANCE (mm) FOR EXCAVATION AROUND ENERGISED UNDERGROUND CABLES

MINIMUM APPROACH DISTANCE (mm) FOR EXCAVATION AROUND ENERGISED UNDERGROUND CABLES		NON-DESTRUCTIVE DIGGING		POWERED EXCAVATION	
		Ordinary Person	Authorised Person	Ordinary Person	Authorised Person
Nominal phase to phase voltage AC	LV up to and including 400 V (See earthing systems[2])	300[1]	Insulated contact[1]	500	300 or to marker tape/hardcover
	Earthed metallic screened HV – insulated cables up to and including 22 kV (See earthing systems[2])	300[1]	Insulated contact[1]	500	300 or to marker tape/hard cover
	66 kV[3] (See earthing systems[2])	2000	300	3000	300 or to marker tape/hard cover
	132 kV[3] (See earthing systems[2])	3000	1800	3000	1800

Note 1: Denotes – no picks, crow bars within 300mm of energised cables up to and including 22kV. Hydrovac excavation and hand digging to pothole down to the cable itself is permitted.

Note 2: Earthing system cabling is typical buried from 300mm to 450mm deep, Ordinary Person Safe Approach Distance 300. Authorised person: Insulated contact.

Note 3: All persons who intend to undertake activities in sub transmission reservations must comply with the Evoenergy Requirements for Work and Other Activities Within Sub Transmission Reservations procedure.

NDD Excavation must be conducted in accordance with TABLE 5.2 Minimum Approach Distance (mm) for Excavation around Energised Underground Cables. Before excavating parallel to existing cables, the cables must be uncovered at bends, joints and every 10-15 metres along trench line.

Contact Before You Dig Australia (BYDA and /or Evoenergy) for information on underground asset locations. Positive asset identification and location must be conducted prior to any excavations in the vicinity of energised underground cables.

5.7.1 Potholing

Potholing involves digging with hand tools or using hydro vacuum excavation to a pre-determined depth to verify if assets exist in the immediate location.

An authorised person may use insulated hand digging tools suitable for the voltage concerned or use vacuum pumping in the pot-holing process to locate the underground cable. Cables at voltages greater than 22kV must be de-energised before exposing through Hydro Vacuum Excavation NDD.

The potholing must establish the depth and location of Evoenergy's underground cables or conduits prior to commencing further excavation. The spacing of potholes must be close enough to identify all cables, conduits, and services and to establish the profile between potholes with high confidence.

Before excavating parallel to existing cables, the cables must be uncovered at bends, joints and every 10-15 metres along trench line.

A person must not physically handle/touch an underground cable unless the cable is proved de-energised. Underground cables must not be lifted or moved whilst energised.

5.7.2 Hydro vacuum excavation NDD

Hydro Vacuum Excavation (Hydrovac) NDD is a means of safely excavating the earth around buried utilities. When working in the vicinity of underground cables, the following requirements for Hydrovac NDD equipment apply:

- equipment must be suitably earthed or have a permanent static discharge path fitted, and
- fluid temperature must be less than 50 degrees Celsius., and
- fluid or air pressure must be less than 1500psi for a fixed nozzle and 2000psi for rotating nozzle, and
- Hydrovac nozzle must not come within 200mm of cable.

5.7.3 Hand digging

Always use a non-conductive (timber or fibreglass) handled shovel when hand digging around underground cables. When hand digging, orientate the shovel blade parallel to the cable rather than digging across the cable. Never push with the foot or apply bodyweight to the footstep of a shovel when digging within 300mm of energised cables.

Look out for sand, plastic strips or specially marked slabs when excavating, which signal the presence of underground cables.

Picks, mattocks, pry (crow) bars, sharp edged appliances, or any handheld impact tools such as pneumatic drills and electric jack hammers are not considered NDD and as such:

- must not to be used where they could encroach the minimum approach distance (mm) for excavation around energised underground cables as prescribed in Table 5.2, and
- must not be thrown or spiked into the ground in the vicinity of electricity cables.

5.7.4 Powered excavation

For excavation work, any powered equipment except that identified as NDD or non-conductive hand operated tools must adhere to the minimum approach distances for powered excavation. Hand operated/portable pneumatic or powered excavation, cutting and drilling tools (kanga and jack hammers) must not be used in close proximity to conduits and/or live cables as per TABLE 5.2 Minimum Approach Distance (mm) for Excavation around Energised Underground Cables.

Where powered excavation is being performed within the limits permitted by these Electrical Safety Rules, excavator buckets fitted with exposed teeth or ripper tines must not be used.

Where underground cables are installed in conduit, and that conduit, or an adjacent one needs to be cut into, a handheld plastic pipe saw should be used where practicable to do so.

When using powered tools to excavate, cut or drill beside or around direct-laid cables in rock, masonry or hard fill, a non-conductive barrier must be placed between the cable and the tool to protect cables.

Hand operated/portable pneumatic or powered excavation, cutting and drilling tools (kanga and jack hammers) must not be used in close proximity to conduits and/or live cables as per Table 5.2 Minimum Approach Distance (mm) For Excavation Around Energised Underground Cables.

When using powered tools to excavate, cut or drill beside or around direct-laid cables in rock, masonry or hard fill, a steel plate must be placed between the cable and the tool to protect cables.

Extreme care must be taken when digging above or close to the determined asset location.

Marker tape and tiles/pavers/plastic hard covers are commonly used as a location indicator for buried cables but may not always be present. If any location indicators are found use extreme caution, even if you are still outside of the relevant Safe Approach Distance.

5.8 Approach to Energised Insulated Cables

5.8.1 General

When work is performed near energised insulated cables, appropriate precautions must be taken to ensure that the insulation of the cables is not damaged.

Cables must not be moved whilst energised.

Insulated cables must not be directly stood upon.

In excavated cable trenches or cable joint pits if there are cables that are energised, as well as the de-energised cables that are to be worked on, those energised cables should be covered where practical by a minimum of 100mm of sand, or barriers installed for mechanical protection.

Potholing to confirm the locations of energised underground cables up to and including 22kV is allowed.

There must not be any contact with terminations, joints, or unscreened sections of cable.

5.8.2 Earthed metallic sheathed or screened High Voltage (HV) cable

Contact by appropriately authorised persons may be made to external surfaces of energised HV cables up to and including 22kV with earthed metallic sheaths or screens. The type of work being undertaken determines the appropriate level of authorisation.

5.9 Onsite Identification of Underground Cables (Including Out of Commission or Abandoned Cables)

Where it is necessary for a cable to be de-energised to enable access to the cable, the de-energised state must be confirmed onsite by positive identification and testing or by positive identification and the use of a spiking device.

Before working on cables remote from their exposed terminals it is essential that they be positively identified in accordance with ***Cable Identification Spiking and HV Cable Testing*** procedure.

An Access Authority for cable identification and spiking (only) is to be issued to the workers who will identify the cable. This authority must include control of any earths being with the crew conducting cable identification. Testing that would not be possible after spiking, such as insulation resistance baseline, may be performed at cable terminations under the cable identification permit.

If working on high voltage cables, System Control must be notified prior to the removal of any part of the earthing system. After informing System Control, authorised personnel can lift earths as required to apply signal generator.

Out of commission abandoned cables described in Clause 7.6.3 or positively identified cables, do not require an Electrical Access Authority for spiking. When spiking any abandoned or out of commission cables, a switching plan must be prepared on ADMS for notification purposes only. For reactive works, contact System Control prior to spiking.

Methods approved for the identification of cables are:

- tracing the cable visually throughout its entire length from one point of isolation where it can be proved de-energised to the point where the work is to be carried out.
- use of a signal generator and sensing device at the worksite.
- by fault location tests, carried out on the cable, which produce a positive indication at the point where the work will be done, or
- by testing exposed cores at the worksite of damaged cables with an approved test and continuity test.
- Once identified, a cable remote from exposed terminals must be proven de-energised for the purpose of access by:
- spiking cable at worksite, or
- testing exposed cores at the worksite of damaged cables with an approved test.

Labels or drawings must not be relied upon as a positive means of identification of cables.

5.9.1 Spiking of cables

When a cable is to be identified and spiked by a power operated spiking device, the following measures must be taken:

An electrical access permit is to be issued for cable spiking. Where reasonably practicable the electrical condition of the remote ends of the cable must be confirmed as isolated and earthed, and

- the relevant procedure must be followed (refer to Cable Identification Spiking and HV Cable Testing).
- The spiking tool or remote cutter must not be approached for 60 seconds after activation to allow for any auto-reclose function to complete its cycle.

Note: Providing the earth screen of the HV cable is connected elsewhere to an established earth, the use of an approved cable spiking device before contact is **made** with HV conductors satisfies the discharged and/or earthed requirement of Clause 8.1 Access for Work on or Near High Voltage Electrical Apparatus.

5.9.2 Situations where cables should not be spiked

Once identified, there are specific situations where cables should not be spiked:

- a communications cable.
- sheath repairs on a power or service cable.
- an insulation repair where the cable is not to be cut, or
- installation of a ‘tee’ joint by approved methods.
- low voltage single core and sheath repair only.

5.10 Work on Live Low Voltage Underground Cables

Work on exposed energised low voltage underground cables must only be performed by persons specifically trained in the principles and techniques required and who are competent to carry out the work.

A person must not work on exposed energised low voltage underground cables or terminations unless attended by a safety observer.

5.10.1 CONSAC and Paper Insulated Lead Covered (PILC) cables

Work that disturbs (see examples below) low voltage Concentric Neutral Solid Aluminium Conductor (CONSAC) or PILC cables terminations and joints, must not be undertaken while the cables are energised.

Covers, lids, etc. of equipment containing energised CONSAC or PILC cables can be removed, with caution, for operating work, testing and observation purposes only.

Examples of work that disturbs include, but are not limited to:

- bolting and unbolting lugs and connections on the cable.

- maneuvering cable cores.
- repairing cable cores.
- repairing/replacing/connecting service tails and flags.
- repairing/replacing service fuse carriers.
- replacing pillar bases, pits, and
- pole replacements that have CONSAC or PILC cables attached.

5.11 Information Provided at Cable Ends of Installed Underground Cables

Information should be attached to each end of disconnected cables, including newly installed, temporarily disconnected, or redundant cables where the cable ends are at a remote site. The information should include:

- location of the remote end.
- connected or disconnected status to equipment, and
- any special precautions.

Redundant or permanently disconnected cables must be communicated to the System Operator, recorded on appropriate maps or plans, short-circuited and capped.

5.12 Induced Voltages and Transferred Earth Potentials

In circumstances where the work involves direct contact with the metallic high voltage cable sheath or armoring and is not within the earth grid of a substation, one of the controls in Clause 5.12.1 or 5.12.2 must be implemented.

5.12.1 Equipotential “Bonded” Work Area

Controlling voltage differentials by creating an equipotential “bonded” work area is the preferred working environment as it limits voltage differentials. All conductive materials within the designated work area must be electrically connected to the metallic screen of the cable and the protective earth mat.

When disconnecting or creating an equipotential area, insulating gloves (with approved outer gloves) must be worn on EACH hand.

5.12.2 Insulated Work Area

Where an equipotential “bonded” or isolated and disconnected work area cannot be practically achieved then insulated conditions are to be established and maintained.

Where step and touch potentials exist, an insulated work area is established by lining the floor and walls of the cable pit with Evoenergy approved insulating material consisting of insulating barriers and insulating ground mats. Where multiple insulating barriers and ground mats are used nsure an overlap of 100mm.

All exposed metallic structures within reach in the work area must be covered with an Evoenergy approved insulating material while work is being carried out on un-earthed and bonded cables. Extreme care is to be taken not to come in contact with uninsulated metallic objects or earth potentials.

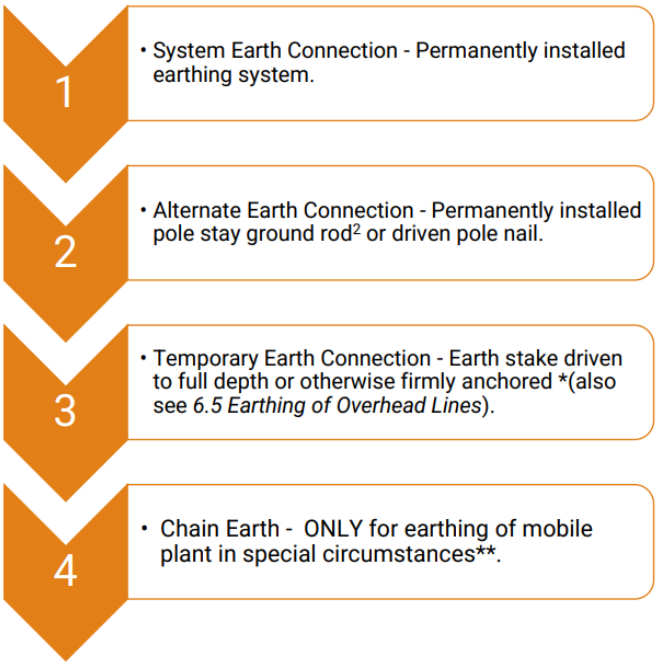
Workers must wear an approved insulating glove on each hand when installing insulating material.

6 Earthing Electrical Apparatus

6.1 Key Requirement

Earthing devices must be applied by an authorised person following a safe to earth confirmation and placed to ensure the safety of workers.

6.2 Earthing Hierarchy



Notes:

* Cannot be dislodged by hand.

** Where there is no permanent earth AND an electrode cannot be driven due to hard pavement or roadways, or there is a significant risk of hitting buried assets. After consultation with the PIC, an earth chain may be used.

1. Options 2 and 3 must only be used for a portable earthing device if option 1 is unavailable.
2. Ground stay wire must have stay insulator/s installed.

6.3 General

Only approved earthing devices must be used, and they must only be applied after the circuit or electrical apparatus is isolated and after confirmation by an approved 'Safe to Earth' method.

The normal state for permanent earth switches, where the mechanism is separate to that of the isolator and the mechanism is supplied lockable by the manufacturer, must be locked at all times except when in immediate use.

Fuses must not be included in earthing circuits.

Protection must be suppressed on circuit breakers if used for earthing.

In applying an earthing device, it must be connected to earth before it is applied to the conductors, and it must be removed from the conductors before it is disconnected from earth. So far, as is reasonably practicable conductors must be bonded via the earthing device.

Wherever reasonably practicable, an earth must be applied and removed by an approved device. When hand application or removal of an earth to switchgear is unavoidable:

- all phases must be discharged, and
- Another earth applied with an approved device must be maintained in contact with each conductor in turn while the hand applied earth is being attached or removed, refer to Clause 6.7 High Voltage (HV) Metal-Clad Switch Units.

When applying a portable earthing device that is not connected to a permanently installed station earthing system it must be regarded as liable to become energised until the circuit earthing is complete.

There are some situations where an electrical operator cannot comply with the clearances specified as safe approach distance, when applying earths to electrical apparatus during the preparation for access. In these situations, procedures may permit such approach only to that part of the electrical apparatus, which already has local isolation and earthing.

6.4 Earthing for Access to High Voltage Electrical Apparatus

Earths must be applied such that conductors within the work area are effectively earthed or have an earth placed between the work area and each point of supply, refer to Clause 8.4.3 for interconnected LV.

Wherever reasonably practicable earths must be placed at the site of the work.

Prior to access, earthing must be confirmed by an approved indication such as:

- sighting of an operational earth applied to exposed electrical apparatus, or
- an approved position indicator (semaphore), and/or operating handle/lever, showing a device to be in the earthed position.

Whilst making and breaking bridge connections, both sides of the bridge connection should be maintained at the same potential using hot line leads, hoppers, or jumpers.

6.4.1 Operational earths

In earthing electrical apparatus for access, earths applied by the electrical operator, as noted on the access authority, must be considered operational earths. The operational earths must be applied by or under direct supervision of an electrical operator and they must be applied before an electrical access authority is issued.

All operational earths must be recorded on the electrical access authority prior to issue and must be under the control of System Control. Operational earths must not be removed from electrical apparatus or otherwise altered under an access authority without permission from System Control. After permission is granted by System Control to modify earthing the recipient must notify all staff signed on to or affected by the access authority of the change in earthing conditions.

All earths applied on the underground network between a point of supply and the worksite must be regarded as Operational Earths.

6.4.2 Working earths

After access has been given to HV electrical apparatus, additional working earths must be applied as necessary to maximize workers safety and to visually indicate the isolated and ‘at earth potential’ condition of the electrical apparatus.

These working earths should be applied within the accessed area in the order of preference set out in Clause 6.1 Earthing Hierarchy.

All working earths applied during the currency of the access authority must be recorded on the access authority. Working earths are under the control of the recipient of the access authority. An operational earth, designated and/or used by workers as a working earth, must remain under the control of System Control.

The Recipient must ensure that:

all working earths are removed before relinquishment of the access authority.

all earths applied by work crews for testing purposes are removed before the relinquishment of the access authority, and

operational earths are not removed without permission from System Control before cancellation of the access authority.

For earthing requirements regarding mobile plant refer to Clause 2.5.3 Use of Mobile Plant.

6.4.3 System earths

If part of an earthing system is broken dangerous voltages may occur. When it is necessary to break a system earth, adequately rated bonds or jumpers must be installed before the break is made. System earths on electrical apparatus must not be removed while the apparatus is in service unless it is specifically known that this can be done safely. Workers must consult their supervisor when a system earth is found to be broken.

Refer to the Energised Low Voltage Works Manual.

6.5 Removal of Earth when Working Under an Electrical Access Authority

During work under an electrical access authority, the recipient must request permission from System Control for the removal of an earth for insulation resistance testing, reconductoring or other purposes, only if such action is considered necessary and safe, and provided:

- System Control grants permission and confirms that the removal of the earth will not affect any other electrical access authorities on issue.
- all workers likely to be affected by the removal of the earth are notified, and
- When known the proposed change must be noted under ‘special provisions’ on the electrical access authority.

Once the earth is removed, the recipient must notify System Control of the removal.

The removed earth must be replaced in the same, or another equally effective position, as soon as possible and the recipient must notify System Control that the earth has been restored.

Permission must be sought from System Control for removal of operational earths at completion of works prior to relinquishment of the access authority

6.6 Earthing of Overhead Lines

Where an overhead line can only be earthed using temporarily driven earth spikes, an operational earth must be applied at all points of isolation towards the work site. Work planning must consider protection against the hazards resulting from energisation and step and touch potentials, refer to Clause 6.1 Earthing Hierarchy.

Working earths when equipotential bonding is not required must be placed a minimum of 8m where reasonably practicable from the area where the work is being performed.

During the discharging and earthing of overhead lines, no workers other than the person applying the earth must approach within 8m of the earthing device, its connections or ladders, poles, or structures from which the earthing device is being applied.

The electrical operator in control of the switching activity must advise the workers when earthing operations are completed. After earthing is complete, to avoid step and touch potential, unnecessary approach to earths must be avoided. Where additional working earths are required, they must be applied so at least one set is visible from the worksite.

6.7 HV Metal-Clad Switch Units

For metal-clad switch units where it is not possible to directly earth conductors and circuits, the method of earthing must be specifically considered by the electrical operator responsible for the earthing and the person in control of the work, particularly in regard to the number and location of earths.

Hand applied spout earths must not be used if there are alternative earthing devices available to be used, refer to Clause 6.4 Earthing for Access to High Voltage (HV) Electrical Apparatus. If no alternative earthing device is available and handheld spout earths are to be applied to a cable circuit, the remote end of the cable must be earthed first and the busbar isolated. If handheld spout earths are to be applied to multi – busbar equipment all busbars must be isolated. Assistance must be provided by another electrical operator during the application of handheld spout earths.

The application of earthing devices to the isolated contacts in the spouts of metal-clad switchgear must be supervised by a person authorised to work on the network unless the devices are specifically approved for application by a single worker.

6.8 Gas Switch Without Earth Position

If a gas switch does not have an earth position and cannot be locked in the open position, the isolation can be regarded as satisfactory for the purpose of carrying out work provided that the switch position indicator shows that the switch is open, and a set of operational earths are installed immediately adjacent to the switch.

A switch that uses a vacuum interrupter alone is not an acceptable form of isolation. Where the switch has a local/remote function then the remote function must be disabled in accordance with Clause 8.3.1 Isolation and Earthing – General

6.9 Precautions Prior to Work Near Aerial Communication Cables

Communication cables have been installed on Evoenergy poles known as joint use poles. Caution is required because of the possibility of induced voltages associated with parallel HV lines and the catenary wire of the aerial communication cables and the possibility of transferring voltages on the catenary wire.

Catenary wires supporting communication cables present a hazard to a worksite. Depending on the installation arrangements of the catenary, the catenary could be either earthed and pose a risk when working on energised mains and apparatus or be effectively energised (through induction) and compromise an isolated worksite. Special precautions, such as matting, must be taken to cover catenary support wires to reduce the risk of inadvertent energisation of the catenary wire.

Any work involving the disconnection of the catenary wire from a permanent earth must not proceed until the catenary wire is earthed by means of Bonders/Temporary Bridge attached to both sides.

6.10 Erection or Dismantling of Overhead Conductors

When overhead lines (other than insulated LV service lines) or long lengths of metal busbars are being erected, dismantled, or replaced and there is any possibility of contact with, or induction from, adjacent energised conductors of any description, such conductors being moved must be earthed. They must be earthed by an approved device before work commences and must remain earthed until the work is completed. A conductor being erected must be earthed before it is lifted from the ground.

Consideration must be given to the use of appropriate restraining devices to control such conductors when they are being moved. Appropriate measures at over or undercrossing positions are:

- the application of approved earthing devices to the new bare conductors at the over/undercrossing location and, if reasonably practicable, attachment of an approved earthing device to new conductors adjacent to the future supply point, or
- construction of temporary physical barriers, such as timber structures, between the new and existing apparatus at the over/under crossing in accordance with approved procedures. Refer Conductor Stringing Procedure.

6.11 Equipotential and Personal Protective Bonding

6.11.1 General

Equipotential bonding is the practice of electrically connecting all exposed conductors or metallic items together so that they remain at the same electrical potential. This protects workers from dangerous differences in voltage, reducing the chance of electric shock.

A Personal Protective Bond is a high voltage bond to ensure all electrical apparatus and equipment being worked on is maintained at the same potential and provides an equipotential working zone.

Equipotential and Personal Protective Bonding is necessary when working on high voltage apparatus to ensure that shock hazards do not arise from the inadvertent contact between two points of different potential.

Equipotential and Personal Protective Bonding will be required if it is possible that a worker will be able to simultaneously make contact with the earthed line and other non-bonded conductive equipment.

Where reasonably practicable:

- All work on high voltage conductors must proceed under equipotential conditions.
- isolate the conductors from all possible sources of supply, or
- ensure there is no possible chance that a person can form a bridge between two points of different potential.

Note: In situations that do not allow to equipotential bond an open circuited conductor an approved insulating glove (with approved outer gloves) must be worn on EACH hand.

6.11.2 Underground

In circumstances where the work involves direct contact with the metallic HV cable sheath or armoring and is not within the earth grid of a substation, one of the controls in Clause 6.11.3 or 6.11.4 must be put in place.

6.11.3 Insulated working conditions

All exposed metal parts of cables or pipes or any other parts which may be earthed, and the joint-hole or confined space itself, must be covered with insulating material, suitable for the voltage concerned, while work proceeds on one conductor only.

6.11.4 Bonded earth mat conditions

An equipotential area must be created using wire mesh, all bonded together, covering the floor, walls, etc. All cable sheaths must be connected to the earth mat so that equipotential conditions are maintained. If not practical, the cable cores

7 Issue of Access Authorities and SCAP

7.1 General

Workers planning work on, near or in the vicinity of electrical apparatus, must consider the application of an appropriate access authority. Evoenergy's Work Request Procedure describes the process and requirements for the preparation, submission, and processing of ADMS work requests for network switching, access, and notifications.

Where access is required to de-energised electrical apparatus on a worksite under the control of an access authority, the access authority must be documented on the JRA (Job Risk Assessment) as a control measure and communicated to all persons during induction onto the worksite. All workers who will approach the electrical apparatus under the control of an electrical access authority must sign on to the electrical access authority and sign off prior to relinquishment.

The processes for the access authorities detailed in these electrical safety rules are outlined below in Clauses 7.2–7.7.

A checklist prior to signing onto any access authority is shown in Chart 7.1 Access Authority Sign-On Checklist.

For work on or near HV electrical apparatus, ***Section 8 Access for Work on or Near High Voltage Electrical Apparatus***, must be read in conjunction with this section. For access to LV electrical apparatus, ***Section 9 Access to Low Voltage Electrical Apparatus***, must be read in conjunction with this section.

Where there is provision for the isolation point to be locked, an approved electrical lock must be used until the access authority has been relinquished.

Checklist Prior To Signing Onto An Access Authority

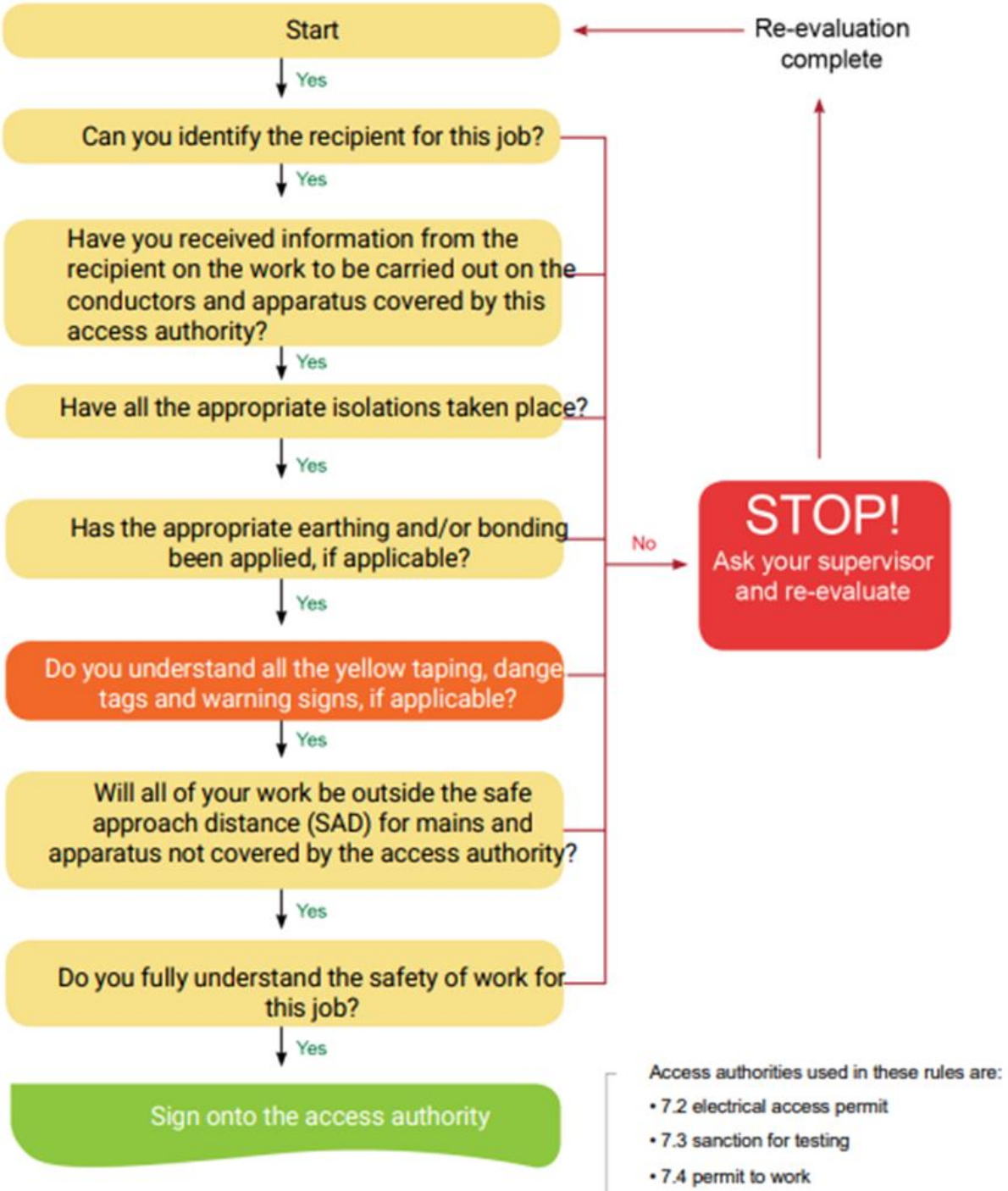


CHART 7.1 ACCESS AUTHORITY SIGN-ON CHECKLIST

Access authorities used in these rules are:

- 7.2 electrical access permit
- 7.3 sanction for testing
- 7.4 permit to work

7.2 Electrical Access Permit

7.2.1 Application for an electrical access permit

Electrical Access Permits must be issued by an electrical operator to a person authorised to Work On, for work to be performed on de-energised electrical apparatus. A switching request must be entered through ADMS for all pre-arranged de-energised work on Evoenergy's electricity network.

Before making an application for an electrical access permit, the applicant must establish that the proposed work has been properly planned and can be carried out safely. Consideration must be given to:

- work method.
- safety outcomes of the completed works.
- testing on restoration.
- work environment, and
- the skills and authorisations of the workers.

The electrical apparatus to be covered and its location must be accurately defined and the work to be undertaken adequately described.

An application must be completed for all pre-arranged de-energised work on Evoenergy's electricity network to initiate access requirements. All such applications must be submitted to System Control.

7.2.2 Multiple working parties under a common electrical access permit

Where an electrical access permit is issued along with any other access authority on the same electrical apparatus, or where separate parties are working under the terms of one access permit, there must be coordination by one Person in Control (PIC). The PIC must be the Recipient, be identified in the job risk assessment, and have an overall appreciation of all aspects of the work to be performed. Any changes made by any party performing the work must be conveyed to the PIC and disseminated to all members of the work groups to ensure that the actions of one worker must not endanger the safety of others.

7.2.3 Multiple ownership – protocol

Where the scope of electrical apparatus to be covered is owned by more than one organisation, a protocol must be established between those organisations for processing the application to coordinate the outage and issue of a SCAP to the private organisation's licensed electrician.

7.2.4 Issue, receipt, relinquishment, and cancellation of electrical access permits

An electrical access permit and a sanction for testing must not be on issue on the same electrical apparatus simultaneously. An electrical access permit must be issued in person by an electrical operator to the appropriately authorised Recipient and relinquished by the Recipient.

Relinquishment of an electrical access permit must be done through System Control by the Recipient at the completion of the work. Notification that the electrical access permit has been cancelled must be by accepted means directly to System Control by the electrical operator.

At the time of issue, the electrical operator must clearly describe and, where reasonably practicable, show the electrical apparatus covered by the electrical access permit and the precautions taken to the Recipient and the workers who will be approaching the electrical apparatus. It is the responsibility of the Recipient to ensure every worker has the appropriate authorisation and qualifications to carry out the work, clearly understands the conditions and extent of the electrical access permit before they sign onto the electrical access permit.

The electrical operator must also describe or point out the nearest points of supply and any nearby energised electrical apparatus.

Both the electrical operator and the Recipient must ensure that the condition of the electrical apparatus, covered by the electrical access permit, is safe for the proposed work.

All workers must satisfy themselves concerning the precautions taken, the location of the points of supply, and the proximity of any nearby energised electrical apparatus.

Any worker involved in the issue or receipt of an electrical access permit who is not satisfied with the conditions may apply to have additional precautions taken, either before the electrical access permit is issued or during the currency of the work.

After the issue of an electrical access permit additional workers may sign onto the electrical access permit, after appropriate instruction by the Recipient.

The person in control of the work must perform a job risk assessment and must involve all workers in that job risk assessment. Any precautions to be taken to eliminate hazards and prevent injury to any worker must be specified before work commences.

7.2.5 Workers and persons permitted to sign onto electrical access permits

Workers and persons permitted to sign onto an electrical access permit must be authorised persons or supervised workers. Where a supervised worker is required to sign onto an Electrical Access Permit, it is the responsibility of the Recipient to ensure that such workers are placed under the effective supervision of a Person authorised to Work On.

Persons authorised to Work On – Electrical Access Permits

The conditions under which an authorised person must sign onto an electrical access permit is that they:

- understand the electrical apparatus covered and the limits of the electrical access permit.
- are satisfied with the precautions taken.
- are aware of the nearest energised electrical apparatus.

Persons authorised to Work Near – Electrical Access Permits

The conditions under which a person authorised to work near must sign onto an electrical access permit is that the person:

- Understands instructions given on what approach is permitted to the electrical apparatus.
- Understands instructions given on what activity is permitted to be taken in relation to the electrical apparatus.
- Agrees to work under the effective supervision of a nominated person authorised to Work On.

Ordinary Person - Supervised Workers – Electrical Access Permits

An Ordinary Person must remain outside of the work area controlled by an Electrical Access Permit unless signing on as a Supervised Worker. The conditions under which a Supervised Worker must sign onto an electrical access permit is that the person:

- Understands instructions given on what approach is permitted to the electrical apparatus.
- Understands instructions given on what activity is permitted to be taken in relation to the electrical apparatus.
- Agrees to work under the effective supervision of a nominated person authorised to Work On.

7.2.6 Responsibilities of an authorised electrical operator

- Obtain approval from System Control prior to performing any switching on the Evoenergy network.
- Correctly identify the electrical switching apparatus before the apparatus is operated.
- Report any switching performed in error, or anomaly encountered, immediately to System Control.
- Confirm that earthing is performed in accordance with these Electrical Safety Rules.
- Ensure placement and removal of low voltage bonders are recorded on the Electrical Access Permit.
- Fully describe to the Recipient and workers the limits of and the precautions taken for the Electrical Access Permit.
- Ensure all workers at time of issue:
  - understand the limits of the Electrical Access Permit,
  - are satisfied with the precautions taken,
  - are aware of the nearest live electrical apparatus and
  - confirm that the workers are satisfied with those conditions.
- Ensure assets are fit for purpose prior to cancellation of Electrical Access Permit and restoration of supply.

- Notify System Control upon cancellation of the Electrical Access Permit and confirm that electrical apparatus is fit for purpose prior to restoration of supply.

7.2.7 Responsibilities of recipient

- Be informed of and understand the limits of access to the apparatus and the control measures applicable.
- Ensure placement and removal of working earths and bonders are recorded on the Electrical Access Permit.
- Be conversant with the work to be undertaken, the appropriate electrical procedures and electrical work practices to be used by the work party.
- Ensure that all members of the work party approaching electrical apparatus sign on the Electrical Access Permit and sign off prior to relinquishment.
- Ensure all additional workers post issue:
  - understand the limits of the Electrical Access Permit,
  - are satisfied with the precautions taken,
  - are aware of the nearest live electrical apparatus and
  - confirm that the workers are satisfied with those conditions.
- Advise System Control of any lost or damaged Electrical Access Permit.
- Confirm electrical apparatus is fit for purpose prior to relinquishment of the Electrical Access Permit.

7.2.8 Responsibilities of persons authorised to work on

- Sign on the Electrical Access Permit to indicate they acknowledge the requirements of the Electrical Access Permit.
- Be informed of, and understand, the limits of access to the apparatus and the control measures applicable.
- Be informed of, understand, and comply with the safety directions and warnings given.
- Ensure placement and removal of overhead working earths at the worksite are conducted in consultation with the Recipient and recorded on the Electrical Access Permit.
- Ensure they are currently authorised and competent to perform the task required.
- Be conversant with the work to be done.
- Prior to departure from the worksite, sign off the Electrical Access Permit or provide advice to the Recipient otherwise. Seek approval from the Recipient for changes in precautions during the work.
- Ensure assets are fit for purpose prior to the cancellation of the Electrical Access Permit and restoration of supply

7.2.9 Responsibilities of a persons authorised to work near and supervised workers

- Sign on the Electrical Access Permit under the effective supervision of a person authorised to Work On.
- To indicate they acknowledge the requirements of the Electrical Access Permit.
- Be informed of, and understand, the limits of access to the apparatus and the control measures applicable.
- Be informed of, understand, and comply with the safety directions and warnings given.
- Prior to departure from the worksite, sign off the Electrical Access Permit or provide advice to the Recipient otherwise.

7.2.10 Rejection of a person signing onto an electrical access permit

A worker must recommend the exclusion from an electrical access permit of any other worker who at any time is considered to be unsafe. Such instances must be reported promptly to the person in control of the work and relevant Supervisor.

7.2.11 Absence of an earth on electrical apparatus under electrical access permit

Wherever reasonably practicable, electrical apparatus must be earthed before the issue of an electrical access permit. Where an earth has not been applied to electrical apparatus prior to the issue of an electrical access permit the recipient must arrange for discharging and/or earthing of the electrical apparatus before any worker touches the HV conductors. This clause would apply to isolated and racked out apparatus under maintenance.

7.2.12 Recipient working alone

An electrical access permit may be issued to an authorised recipient who may work alone under the terms of an electrical access permit in accordance with procedures provided that:

- there is no exposed energised electrical apparatus near the recipient, and there is no possibility of the recipient making contact under any circumstances, or
- warning notices are placed, and suitable barriers are erected to prevent the recipient inadvertently infringing the normal safe approach distance to energised electrical apparatus.

7.2.13 Issuer also the recipient

An issuer of an electrical access permit may also be the Recipient. This would only be the case when the work to be performed would be by a single worker or that no one else onsite is authorised to Work On.

7.2.14 Temporary cessation of work or absence of workers from worksite

It must be the duty of each worker (recipient) signed onto an electrical access permit to sign off the electrical access permit before leaving the worksite.

Following a cessation of work, or when workers have been temporarily absent from the worksite, each worker, before signing back onto the electrical access permit must report to the recipient.

The Recipient must confirm the condition of the electrical apparatus under the electrical access permit and any nearby energised electrical apparatus. The workers must not approach the electrical apparatus within the limits specified in Clause 2.2.2 Safe Approach Distances until they have re-signed onto the electrical access permit.

If the Recipient and all workers leave the worksite the electrical access permit must be relinquished. The exception to this rule is where System Control has approved the access permit to be carried over an extended period prior to the permit being issued.

Where an electrical access permit is for use over several days each worker must sign off at the end of each work period, but the permit may be kept open with System Control approval. At the start of the next work period the recipient must:

- contact System Control to confirm that the isolation has not changed as noted in permit details, and
- visually check earths and isolation points.

After the completion of a job risk assessment, if there has been no change each worker can sign back onto the electrical access permit and commence work.

7.2.15 Transfer of an electrical access permit

Where the Recipient is unable to continue work or needs to leave the worksite, the electrical access permit may be transferred to a new Recipient.

The transfer may only be carried out if:

- both workers are present onsite.
- The new Recipient is a person authorised to Work On the network.
- The original Recipient ensures that the worker to whom the electrical access permit is to be transferred is fully aware of and clearly understands all safety aspects of the permit and works prior to the transfer, and
- the work crew is notified.

An electrical access permit may only be transferred once. If more than one transfer is required, then the permit must be cancelled and a new permit issued.

Once the electrical access permit has been transferred, System Control must be notified of the change of the Recipient.

If the intended new Recipient has already signed onto the electrical access permit as a worker, that worker must sign off before becoming the new Recipient.

7.2.16 Working on multi-circuit overhead lines

Where more than one HV circuit is carried on a pole or structure and work under an electrical access permit is to be performed on isolated and earthed circuits, while others remain energised, the Recipient must ensure that each worker is informed of and can identify the energised circuits and the relevant safe approach distances.

When conductor/s (other than a service line) are being erected, replaced or dismantled on any pole or structure which already carries energised conductors, the live components must have insulating covers placed around them, and conductor/s being worked on must be earthed until secured in their final positions and/or completely dismantled, refer to Clause 6.8 Erection or Dismantling of Overhead Conductors.

7.2.17 Change of electrical access permit conditions

Continuity of earthing must be maintained while work is performed upon electrical apparatus under an Access Permit (refer to Earthing Construction Manual Volume 6). Continuity of earthing of overhead lines must not be rendered ineffective by disconnection or by cutting conductor/s unless replacement earths are attached.

The conditions of isolation specified on an electrical access permit must not be changed until the electrical access permit is relinquished and then cancelled. The only exception being the removal of an earth as allowed under Clause 6.4 Removal of Earth when Working under an Electrical Access Authority.

A new electrical access permit may be issued after the changes in isolation are complete.

7.2.18 Relinquishment and Cancellation of an Electrical Access Permit

Workers Signing off an Electrical Access Permit

It must be the duty of each worker that has signed onto an electrical access permit to sign off before the electrical access permit is relinquished.

Responsibilities of the Recipient when Relinquishing an Electrical Access Permit

When an electrical access permit is to be relinquished, the Recipient must:

- ensure that all workers signed onto the electrical access permit have ceased work covered by the electrical access permit and have signed off.
- ensure that all tools and equipment are clear and will remain clear of the electrical apparatus and that the workers having signed off are aware that they must remain clear.
- sign off that the apparatus and conductors are serviceable and safe to re-energise.
- sign off the electrical access permit to indicate that the electrical access permit has been relinquished.

Absence of a Worker at Relinquishment

Signing off an electrical access permit on behalf of another worker is not permitted. Where a worker leaves the worksite without signing off an electrical access permit, all practical steps should be taken to obtain their signature. If the worker is unable to sign off the electrical access permit due to injury, illness or other legitimate reasons, System Control may obtain authority from the appropriate Supervisor for the cancellation on behalf of the absent worker. An appropriately authorised person must sign off on behalf of the unavailable worker.

Lost or Destroyed Electrical Access Permit

If an electrical access permit is lost or destroyed, work must cease until an electrical operator attends to site, confirms the isolation and earthing (if applicable), and issues a new electrical access permit.

Responsibilities of the Electrical Operator when Cancelling an Electrical Access Permit

The electrical operator must:

- confirm that the Recipient has relinquished the permit.
- confirm that all workers have signed off.
- verify with the Recipient the condition of the apparatus.

- check the suitability of the apparatus for service.
- check the configuration of the apparatus in preparation for service.

Electrical access permits must be cancelled by an electrical operator in consultation with System Control by accepted means.

7.2.19 Exceptions for Issuing an Electrical Access Permit

The exceptions for issuing and accepting electrical access permits are:

An emergency when there is an immediate risk to a person's life or property. The work must be carried out under the supervision of a person authorised to Work On the network who makes sure that the necessary procedures for isolating, proving de-energised, earthing, and short circuiting, the mains and apparatus are carried out in accordance with these rules.

- Work is performed outside of the minimum safe approach distances.
- Work is conducted to the requirements of the Live High Voltage Line Manual and the Live HV Network Access, or the Energised Low Voltage Works Manual and the Recording of Live Work in the Vicinity or Near the LV Network.
- LV service conductors less than or equal to 50mm² and not requiring isolation of LV mains.

7.3 Sanction For Testing

7.3.1 General

A sanction for testing must be issued when, for the purpose of testing, it is necessary to work on electrical apparatus in such a manner that the prescribed procedure relating to an electrical access authority must be waived. This would be done in order that the electrical apparatus may be made energised from either normal or test sources at HV or at a voltage or current considered hazardous by the authorised applicant.

A sanction for testing and any electrical access permit or permit to work must not be on issue on the same electrical apparatus simultaneously. Only one sanction for testing must be on issue on the same electrical apparatus at any time.

A sanction for testing must be issued onsite by an electrical operator and relinquished by the tester in charge. Notification that the sanction for testing has been relinquished must be by accepted means to System Control by the tester in charge.

7.3.2 Application for a Sanction for Testing

Application of test voltages >2500V must require a sanction for testing authority unless the apparatus is 'out of commission.'

Only an authorised applicant who can establish that the work is properly planned and can be done safely must make an application for a sanction for testing. The electrical apparatus and the condition in which it is required must be accurately defined and the proposed tests adequately described.

This application can be a verbal request for cable fault locating and network restoration after emergency electrical apparatus repairs.

The requester must have a full understanding of the scope of work being undertaken and the application must consider the following:

- Before applying for Sanction for Testing, the requestor must establish that the proposed work has been properly planned and can be done safely.
- The electrical apparatus to be tested and its location must be accurately defined and the task to be undertaken adequately described in the application.
- Testing must be done according to Safe Work Method Statements providing controls to avoid exposure to hazardous voltages and currents.
- Only one Sanction for Testing must be on issue on the same electrical apparatus at any time.
- Where the scope of electrical apparatus to be covered is owned or operated by more than one organisation, a protocol must be established between those organisations for processing the application and testing requirements.

7.3.3 Workers Permitted to Sign on to Sanction for Testing

Persons permitted to sign onto a Sanction for Testing must be authorised Testers, authorised Electrical Operators, and persons authorised to Work On or Near.

In the case of authorised Electrical Operators and persons authorised to Work On or Near, it must be the responsibility of the Tester in Charge or the authorised tester responsible at remote locations to ensure that such workers are placed in the charge of an authorised person, who may be the Tester in Charge.

The conditions under which an authorised Tester must sign on to a Sanction for Testing are the authorised Tester:

- Understands the electrical apparatus covered and the limits of the Sanction for Testing, and
- Is satisfied with the precautions taken, and
- Is aware of the nearest adjacent live electrical apparatus.

The conditions under which an authorised Electrical Operator or a person authorised to Work On must sign on to a Sanction for Testing are that the authorised Electrical Operator or person authorised to Work On:

- Understands instructions given by the authorised Tester in Charge on what approach is permitted to the electrical apparatus, and
- Understands instructions given by the authorised Tester in Charge regarding the work activity permitted to be undertaken in relation to the electrical apparatus, and
- Aware of the nearest adjacent live electrical apparatus, and
- Agrees to the general supervision by a nominated authorised Tester.

The conditions under which a person authorised to Work Near must sign-on to a Sanction for Testing are that the person:

- Understands instructions given by the authorised Tester in Charge regarding the limit of approach to the electrical apparatus, and
- Understands instructions given by the authorised Tester in Charge regarding the work activity permitted to be undertaken in relation to the electrical apparatus, and
- Is made aware of the nearest adjacent live electrical apparatus, and
- Agrees to the direct supervision by a nominated worker authorised to Work On.

7.3.4 Responsibilities of Tester in Charge

The Tester in Charge must ensure that those members of the work party, who will be making contact or approaching within the prescribed Safe Approach Distances of electrical apparatus under test (including any of the test connections) must sign on the Sanction for Testing.

The Tester in Charge must ensure that the members of the work party are suitably experienced and trained or instructed for the work required of them and that adequate precautions are taken for the safety of all persons.

At the conclusion of the testing, the tester in charge must ensure that the electrical apparatus under test that has become electrically charged during test is fully discharged and left in a safe condition.

When a Sanction for Testing is to be relinquished for cancellation, the Tester in Charge must:

- Ensure that all workers signed on the Sanction for Testing have ceased work covered by the Sanction for Testing, have signed off and are aware that they must remain clear.
- Ensure that all test equipment is clear and will remain clear of the electrical apparatus.
- Sign off the Sanction for Testing to indicate that the Sanction for Testing can be cancelled.
- Advise System Control of the condition of the electrical apparatus at all related locations.

7.3.5 Authorised Tester Responsible at the Remote Location

Where testing works are to be undertaken at a remote end coordinated under a Sanction for Testing, an authorised Tester at the remote location must:

- Assume the same responsibilities as specified for the Tester in Charge.
- Be under the direction of the Tester in Charge.

- Advise the Tester in Charge of changes to the condition of the electrical apparatus at the remote location.

7.3.6 Rejection of a worker under a Sanction for Testing

A worker must recommend the exclusion from a sanction for testing of any other person who at any time is considered to be unsafe. Such instances must be reported promptly to the person in control of the work and relevant Supervisor.

7.3.7 Absence of an earth on electrical apparatus under Sanction for Testing

Wherever reasonably practicable HV electrical apparatus must be proved de-energised and earthed before the issue of a sanction for testing. This is to allow pre-test preparation work to be carried out.

The tester in charge must have control of any earths applied. The earths must be reapplied at the completion of testing.

Where an earth has not been applied to electrical apparatus prior to the issue of a sanction for testing, the tester must arrange for discharging and/or earthing of the electrical apparatus before any worker touches the HV apparatus and/or conductors.

7.3.8 Issuer also an Authorised Tester in Charge

An issuer of a sanction for testing may be the tester in charge. The issuer of a sanction for testing may also sign onto the sanction for testing form (access authority) as a worker.

7.3.9 Temporary Cessation of Work or Absence of Workers

It must be the duty of each worker signed onto a sanction for testing to sign off the sanction for testing before leaving the worksite.

Following a cessation of work, or when workers have been temporarily absent from the worksite, each worker, before signing back onto the sanction for testing must report to the Tester in Charge. The Tester in Charge must confirm the condition of the electrical apparatus under Sanction for Testing including remote locations and any adjacent electrical apparatus.

The workers must not approach the electrical apparatus within the limits specified in Clause 2.2.2 Safe Approach Distances, until they have re-signed onto the sanction for testing.

Where a sanction for testing is for use over several days each worker must sign off at the end of each work period, but the permit may be kept open with System Control approval.

At the start of the next work period the Tester in Charge must:

- contact System Control to confirm that the isolation has not changed as noted in the sanction for testing, and
- earths and isolation points are checked and confirmed by an authorised person as a witness at each location.

7.3.10 Transfer of a Sanction for Testing

Where, in unforeseen circumstances, the tester in charge is unable to continue work or must leave the worksite, the Sanction for Testing may be transferred to another authorised tester.

The transfer may only be carried out if:

- both workers are present onsite.
- the new Tester in Charge is an authorised tester, and
- the original Tester in Charge ensures that the worker to whom the Sanction for Testing is to be transferred is fully aware of all safety aspects of the Sanction for Testing and work prior to the transfer.

Once the Sanction for Testing has been transferred, System Control must be notified of the change of the Tester in Charge. If the intended new tester in charge has already signed onto the sanction for testing as a worker, that worker must sign off before becoming the new Tester in Charge.

7.3.11 Relinquishment and Cancellation of Sanctions for Testing

7.3.11.1 Responsibilities of the Tester in Charge when Relinquishing a Sanction for Testing

At the conclusion of the testing, the tester in charge must ensure that the electrical apparatus under test that has become electrically charged during test is fully discharged and left in a safe condition.

When a sanction for testing is to be relinquished, the tester in charge must:

- ensure that all workers signed onto the sanction for testing have ceased work covered by the sanction for testing and have signed off.
- ensure that all equipment is clear of the electrical apparatus and that workers having signed off are aware that they must remain clear,
- sign off the sanction for testing as the tester in charge to indicate that it has been relinquished.
- advise System Control of the condition of the electrical apparatus.

7.3.11.2 Responsibilities of the Electrical Operator when Cancelling a Sanction for Testing

Sanction for testing must be cancelled with System Control by an electrical operator. The electrical operator must:

- confirm that the recipient has relinquished the permit.
- confirm that all workers have signed off.
- verify with the recipient the condition of the apparatus.
- check the suitability of the apparatus for service.
- check the configuration of the apparatus in preparation for service.

7.4 Permit To Work

A Permit to Work does not provide access to Evoenergy's network. A Permit to Work ensures that the network has been de-energised and adequate precautions taken where it has been identified through a site-specific Job Risk Assessment that there is a reasonable possibility of a person, either directly or through any conducting medium (for example via mobile plant or insufficiently insulated or covered tools or equipment), coming within the relevant safe approach distances. Also see Section 9 Access to Low Voltage (LV) Electrical Apparatus.

7.4.1 Application for a Permit to Work

A written application in accordance with the Evoenergy Work Request Procedure must be completed for all pre-arranged de-energised work near to the Evoenergy's electricity network to initiate the Permit to Work.

Before making an application for a permit to work, the applicant must establish that the proposed work has been properly planned and can be carried out safely. Consideration must be given to:

- work method.
- work environment.
- the skills and authorisations of the workers.

The electrical apparatus to be covered and its location must be accurately defined and the work to be undertaken adequately described.

7.4.2 Multiple Working Parties

Where a permit to work is issued along with any other access authority (for example another permit to work, electrical access permit) on the same electrical apparatus, or where separate parties are working under the terms of one permit to work, there must be coordination in planning and performing the work to ensure that the actions of one worker must not endanger the safety of others. Refer to Clause 7.2.2 Multiple Working Parties Under a Common Electrical Access Permit.

Overall coordination of the access authority issues must be the responsibility of System Control.

7.4.3 Issue, receipt, relinquishment, and cancellation of permits to work

A permit to work and a sanction for testing must not be on issue on the same electrical apparatus simultaneously.

A permit to work must be issued by an electrical operator to the recipient in person and relinquished by the recipient. Notification that the permit to work has been cancelled must be by accepted means to System Control by the electrical operator.

Recipients of a Permit to Work must be suitably trained in the Electrical Safety Rules and appropriately authorised. An appropriately authorised person to receive a Permit to Work can be a Person authorised to Work On or Near, and an authorised third-party worker.

At the time of issue, the electrical operator must clearly describe and, where reasonably practicable, show the electrical apparatus covered by the permit to work and the precautions taken to the recipient.

It is the responsibility of the recipient to ensure every worker clearly understands the conditions and extent of the permit to work before they sign onto the permit to work.

The electrical operator must also describe or point out the nearest points of supply and any nearby energised electrical apparatus.

Prior to the issue of a permit to work near or in the vicinity of deenergised HV conductors, one set of operational earths must be applied within the isolation area to prove de-energised.

For work other than vegetation management work near LV conductors, the application of bonders must be in accordance with the Earthing Construction Manual Volume 4 -LV Portable Earthing and Bonding prior to the issue of a permit to work. For vegetation management work using insulated tools refer to 7.4.11 Work by Authorised Vegetation Management Workers Requiring the isolation of Overhead Conductors.

Both the electrical operator and the recipient must ensure that the condition of the electrical apparatus, covered by the permit to work, is safe for the proposed work.

All workers must satisfy themselves concerning the precautions taken, the location of the points of supply, and the proximity of any nearby energised electrical apparatus.

Any worker involved in the issue of or receipt of a permit to work who is not satisfied with the conditions may apply to have additional precautions taken, either before the permit to work is issued or during the currency of the work.

Subsequent to the issue of a permit to work, additional workers may sign onto the permit to work, after appropriate instruction by the recipient.

The person in control of the work must perform a job risk assessment and must involve all workers in that risk assessment. Any precautions taken to eliminate hazards and prevent injury to any worker must be specified before work commences. A job risk assessment form must be completed in accordance with the Job Risk Assessment Procedure.

7.4.4 Persons Permitted to Sign onto Permits to Work

If an Ordinary Person is required to sign onto the permit to work as a Supervised Worker, it must be the responsibility of the Recipient to ensure that such persons are effectively supervised by an appropriately authorised person who can receive a permit to work.

7.4.5 Persons authorised to Work On or Near – Permit to Work

The conditions under which an authorised person must sign onto a permit to work are that the worker:

- understands the electrical apparatus covered and the limits of the permit to work.
- is satisfied with the precautions taken.
- is aware of the nearest energised electrical apparatus.
- have technical knowledge or relevant trade experience to perform the task concerned.

7.4.5.1 Ordinary Person / Supervised Worker – Permit to Work

The conditions under which an Ordinary Person must sign onto a permit to work is they:

- Understands instructions provided by the Recipient on what approach is permitted to the electrical apparatus and the hazard controls of the worksite.
- agrees that no work is to be undertaken in relation to the electrical apparatus.
- agrees to the effective supervision by the recipient or a nominated appropriately authorised person.
- agrees to follow any instructions given at all times.

7.4.6 Rejection of a Worker Signing onto a Permit to Work

A worker must recommend the exclusion from a permit to work of any other worker who at any time is considered to be unsafe. Such instances must be reported promptly to the recipient and the person in control of the work.

7.4.7 Temporary Cessation of Work or Absence of Workers from Worksite

It must be the duty of each worker who signed onto a permit to work to sign off the permit to work before leaving the worksite.

Following a cessation of work, or when workers have been temporarily absent from the worksite, each worker, before signing back onto the permit to work must report to the recipient. The recipient must confirm the condition of the electrical apparatus under permit to work and the nearby electrical apparatus. The workers must not approach the electrical apparatus until they have re-signed onto the permit to work

If the recipient and all workers leave the worksite the permit to work must be relinquished.

7.4.8 Transfer of a Permit to Work

Permits to work must not be transferred. If the recipient is unable to continue work, or needs to leave the worksite, the permit to work must be relinquished.

7.4.9 Relinquishment and Cancellation of a Permit to Work

Persons Signing Off a Permit to Work

It must be the duty of each worker that has signed onto a permit to work to sign off before the permit to work is relinquished.

Responsibilities of the Recipient when Relinquishing a Permit to Work

When a permit to work is to be relinquished, the recipient must:

- ensure that all workers signed on to the permit to work have ceased work covered by the
- permit to work and have signed off.
- ensure that all tools and equipment are clear and will remain clear of the electrical apparatus
- and that the workers who have signed off are aware that they must remain clear.
- sign off the permit to work to indicate that the permit to work has been relinquished.
- advise the electrical operator or appropriately authorised person of any condition of the electrical apparatus which could affect its operation.

Absence of a person at Relinquishment

Signing off a permit to work on behalf of another worker is not permitted. Where a worker leaves the worksite without signing off a permit to work, all practical steps should be taken to obtain their signature. If the worker is unable to sign off the permit to work due to injury, illness or other legitimate reason, System Control may obtain authority from the appropriate supervisor for the cancellation on behalf of the absent worker. An appropriately authorised person must sign off on behalf of the unavailable worker.

Lost or Destroyed Permit to Work

If a permit to work is lost or destroyed, work will cease until a new permit to work is issued.

Responsibilities of the Electrical Operator when Cancelling a Permit to Work

The system control authorised person must:

- confirm that the recipient has relinquished the permit.

- confirm that all workers have signed off.
- verify with the recipient the condition of the apparatus.
- check the suitability of the apparatus for service, and
- check the configuration of the apparatus in preparation for service. Permits to Work must be cancelled with System Control by a system control authorised person.

7.4.10 Permit To Work Issued to Non-Evoenergy Personnel

When a work request is received for isolation of electrical conductors or apparatus, then the isolation and issue of a permit to work must be in accordance with these Electrical Safety Rules.

The permit to work must be issued to a worker who is appropriately authorised to receive a permit to work. If the person is not appropriately authorised to receive a permit to work, then the permit to work must be issued to an Evoenergy employee who is authorised to receive a permit to work. The person must sign onto the permit to work following the procedures as outlined in Clause 7.4 Permit to Work.

Prior to the issue of a permit to work near or in the vicinity of deenergised HV conductors, one set of operational earths must be applied within the isolation area to prove de-energised in accordance with Clause 7.4 3 Issue, Receipt, Relinquish and Cancellation of Permits to Work.

For work other than vegetation management work near LV conductors, the application of bonders must be in accordance with the Earthing Construction Manual Volume 4 -LV Portable Earthing and Bonding prior to the issue of a permit to work.

For vegetation management work using insulated tools refer to 7.4.11 Work by Authorised Vegetation Management Workers Requiring the isolation of Overhead Conductors.

7.4.11 Work by authorised Vegetation Management Workers requiring the Isolation of Overhead Conductors.

When an authorised Vegetation Management Worker requires the isolation of overhead lines to safely clear vegetation from those lines, then the isolation and the issue of a permit to work must be in accordance with these Electrical Safety Rules refer Clause 7.4 Permit to Work.

Prior to the issue of a permit to work in the vicinity of HV conductors, one set of operational earths must be applied within the isolation area (not necessarily visible from the worksite) to prove de-energised refer Clause 7.4.3 Issue, Receipt, Relinquishment and Cancellation of Permits to Work.

The use of approved and tested insulated equipment is required by an authorised Vegetation Management Worker when clearing vegetation under the conditions of a permit to work.

For vegetation management work with insulated tools near LV conductors, the application of bonders is not required for the issue of a permit to work.

7.5 Statement Of Condition of Apparatus and Plant (SCAP)

The SCAP is a statement that covers the condition of Evoenergy's apparatus or plant and does not itself authorise work on or near the apparatus or plant. The SCAP must only be used to isolate Evoenergy's electricity network to provide a private licensed electrician safe access to conduct works on their private network.

A SCAP must only be issued by an appropriately authorised person to a licensed electrician. A SCAP must not be issued to any employee or contractor of Evoenergy.

The SCAP does not apply to another supply authority which maintains a 24-hour control room. The conditions of isolation must remain unchanged until the SCAP is cancelled.

7.5.1 Application for a SCAP

The ***Statement of Condition of Apparatus and Plant*** procedure describes the acceptable circumstances for the application of a SCAP and details the process steps required to issue a SCAP.

Before making an application for a SCAP, the licensed electrician must establish that the proposed work has been properly planned and can be carried out safely. Consideration must be given to:

- safe work methods.
- all hazards, risks, and controls.

- the work environment, and
- the skills and authorisations of the workers.

7.5.2 The Issue and Acceptance of a SCAP

A SCAP and another access authority must not be on issue on the same plant or apparatus simultaneously. A SCAP must be issued by an Evoenergy authorised person in person. The authorised person must contact System Control for a clearance number before the plant or apparatus is isolated. Before the SCAP is issued, testing to prove de-energised must be in the presence of the licensed electrician. At the time of issue, the authorised person must clearly describe and, where reasonably practicable, show the plant or apparatus covered by the SCAP to the licensed electrician.

The authorised person must also describe and indicate the nearest points of supply and any nearby energised electrical apparatus.

The licensed electrician must acknowledge that they understand the condition of the plant or apparatus by signing the SCAP form and accepting the SCAP. It is the responsibility of the licensed electrician to ensure every worker clearly understands the conditions of the plant or apparatus before they begin work.

Once issued, Evoenergy will not change the condition of the electrical plant or apparatus recorded on the SCAP form until such time as the SCAP has been returned by the licensed electrician.

7.5.3 Return and Cancellation of a SCAP

When a SCAP is returned, the licensed electrician must:

- ensure that all tools and equipment are clear and will remain clear of the plant or electrical apparatus.
- ensure that all work has ceased and that all workers are informed of the return of the SCAP.
- sign off to indicate that the SCAP is ready to return to the authorised person who issued it.
- understand that the condition of the plant or apparatus can now change without further notice, and
- advise the authorised person of any condition of the plant or apparatus which could affect its operation.

Before a SCAP is cancelled by the authorised person. The authorised person must:

- confirm that the licensed electrician has returned the signed SCAP.
- confirm that the licensed electrician understands that the condition of the plant or apparatus can now change without further notice.
- conduct a job risk assessment for the worksite and proposed work.
- verify the condition of the plant or apparatus with the licensed electrician.
- contact System Control to confirm cancellation of the SCAP, and
- re-energise the licensed electrician’s installation from the electricity network.

7.5.4 Lost or damaged SCAP

If a SCAP is lost or destroyed, work will cease until a new SCAP is issued.

7.5.5 Transfer of a SCAP

SCAP’s must not be transferred. If the licensed electrician is unable to continue work, the SCAP must be relinquished.

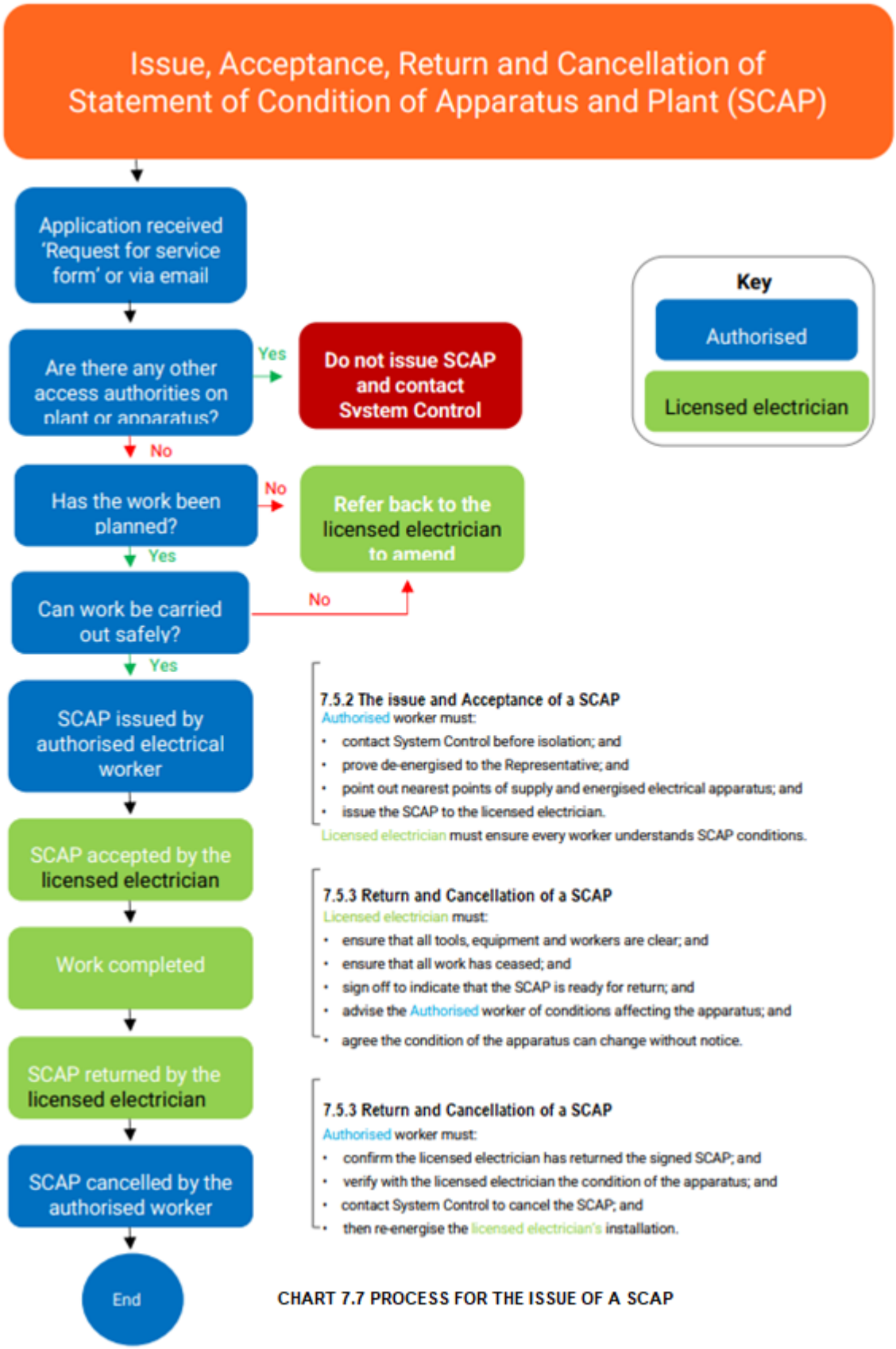


CHART 7.7 PROCESS FOR THE ISSUE OF A SCAP

7.6 Electrical Apparatus Out of Commission

7.6.1 Declaring Electrical Apparatus Out of Commission

An out of commission written declaration identifying the apparatus and the points of disconnection must be submitted to System Control identifying associated control circuits, compressed air supplies, etc.

For electrical assets to be classified as out of commission, they must be deemed No Electrically Connected to the network and meet **ALL** of the following criteria:

- Not available for service
- ADMS reflects the altered status of the network
- Not under operational control of System Control

7.6.2 Access to Out of Commission Electrical Apparatus

Electrical apparatus which is declared out of commission may be approached and worked upon without the issue of an access authority. When not immediately obvious a confirmation of apparatus status must be sought from System Control.

Access to Out of Commission Electrical Apparatus must not be applied to any structures with multiple circuits unless all sources of supply are disconnected from the network by disconnection points and deemed Not Electrically Connected (e.g., twin circuit HV poles or a combination of circuits on a pole).

Although the electrical apparatus is not electrically connected due regard must be given to the possibility of inadvertent energisation from other electrical apparatus, induction, lightning, static charges, or other means.

7.6.3 Work on abandoned Cables

For work by external persons on abandoned cables owned by Evoenergy, the use of appropriate identification processes must be followed during the proposed works. If it is necessary to ‘spike’ abandoned cables onsite to prove they are de-energised this must be done by Evoenergy in accordance with the Cable Identification Spiking and HV Cable Testing procedure.

7.7 Barriers And Signs

All barriers and signs must conform to Australian Standards AS 1319:1994.

7.7.1 General

Appropriate barriers must be installed where necessary to indicate areas containing energised electrical apparatus and the degree of hazard.

Appropriate signs must be installed where necessary to identify:

- electrical apparatus covered by an access authority, or
- adjacent energised electrical apparatus and related hazard.

Barriers must not be altered or crossed except by authorised switchers in consultation with the recipient, refer to Clause 7.7 Barriers and Signs for Electrical Access Authorities.

7.7.2 Hazards which are likely to be life threatening

Situations where there is an immediate and probable risk of contact with energised electrical apparatus must be defined by the use of appropriate 'danger' barriers and/or signs. For example:

- areas where safe approach distance cannot be maintained, or
- areas in which HV testing is in progress.

7.7.3 Hazards which are NOT likely to be life threatening

For the purpose of general identification of those areas where warning is necessary, warning barriers and/or signs must be used for example between work areas and adjacent areas containing energised HV electrical apparatus that do not present an electrical hazard to normal pedestrian movement.

7.7.4 Descriptions of barriers and signs

Energised sign	Approved danger sign having the word 'Energised' printed in white upon a red background
Danger Barrier and/or sign	A barrier and/or sign of suitable material preferably coloured red and white, or alternatively red, to indicate the presence of danger.
Under sanction for testing sign	A danger sign of appropriate dimensions having the words 'Danger High Voltage Testing in Progress' printed in red on a white background.
Warning barrier and/or sign	A barrier and/or sign of suitable material, preferably coloured yellow, or alternatively yellow and black, to indicate the need for a warning.
Yellow tape barrier	A barrier of suitable material coloured yellow, to indicate a dividing line between energised electrical apparatus and the electrical apparatus on which it is safe to perform work under an access authority.

7.7.5 Barriers and signs for electrical access authorities

Prior to the issue of an electrical access authority, barriers and/or signs must be erected where reasonably practicable:

- to make it clearly evident, which electrical apparatus is under an electrical access authority, and which is not, and
- to guard against mistaken or inadvertent contact with other electrical apparatus.

Note: In particular instances where identification is positive, such as on some HV overhead lines and underground cables, and providing appropriate safeguards have been taken, procedures may dispense with the use of barriers and/or signs.

Yellow tape barriers are used to define a safe area for work and indicate the dividing line between energised electrical apparatus and the electrical apparatus on which it is safe to perform work under an access authority.

Workers working in a yellow tape area must not pass over, under or interfere with such tape. After discussion with the recipient, other staff (Supervisors or technical staff) may ‘pass through’ the tape, for the purposes of inspection of other electrical apparatus not directly associated with the work under the access authority. When this occurs, the recipient must ensure the positioning of the tape must be maintained to safeguard the interests of others.

Only an Authorised Electrical Operator will erect, remove, or alter the position of yellow tape barriers.

Additional barriers and signs may be erected after the issue of the electrical access authority by agreement between the Electrical Operator and the Recipient. The provision and positioning of barriers must take into account all likely and unlikely approaches to the work area.

7.7.6 Designated work areas

Yellow tape barriers shall only:

- be used in conjunction with an Access Authority; and
- be erected or altered by an authorised Electrical Operator.

When applied for the purpose of HV testing, the yellow taped barrier must be supplemented by the signage indicating “**DANGER HIGH VOLTAGE TEST IN PROGRESS**.” This sign must be placed at the entrance to the work area.

While testing is underway the entrance must be closed with yellow tape by the Tester in Charge.

Structures that support live HV equipment must not be used to support the yellow tape barrier unless inside the Switch Room.

There are many different substation layouts constructed on the network and to produce a guide for each possible scenario for work in these would not be practical. However, before erecting a yellow tape barrier, the authorised Electrical Operator must give consideration to the extent of the area governed by the Access Authority, for example, where it is proposed to form the opening in the yellow tape barrier, what equipment will remain alive adjacent to the work area and if any special equipment or plant will have to enter during the course of the work.

In rare situations the nature of the substation configuration and switchgear arrangements make it extremely difficult to accurately tape the Access Authority area.

Wherever possible these scenarios are to be identified during job planning and scoping, and they are to include a diagram illustrating the preferred taping arrangements. Where a diagram is not provided, or arrangement is not practical to implement, the authorised Electrical Operator (issuer) and the Access Authority Recipient must agree on site to the most practical method of taping for that situation.

Once agreement has been reached the Access Authority ‘Special Provisions’ are to be noted with the following comment: “Site constraints inhibit yellow tape, limitations discussed and agreed between issuer and recipient”

7.7.7 Yellow tape barrier methods

Two different methods of demarcation taping may be employed. They are the:

- Yellow Tape in Method to define the Access Authority work area inside
- Yellow tape Out Method to define the Access Authority work area outside.

7.7.7.1 Yellow tape in method

A yellow tape barrier is erected around the equipment covered by the Access Authority and inside the taped area becomes the Access Authority work area. Accordingly, any electrical equipment located within or above the yellow taped Access Authority work area must be safe to work on unless specifically excluded in the Special Provisions section of the Access Authority Form.

While carrying out the work under the Access Authority, workers must be capable of maintaining the appropriate safe approach distances to any exposed electrical equipment, either outside the yellow tape barrier or excluded from the Access Authority work area via a warning note in the Special Provisions section of the Access Authority Form.

Entrance to yellow tape area

Where yellow tape barriers are erected, an opening in the yellow tape shall form an entrance to the yellow tape area.

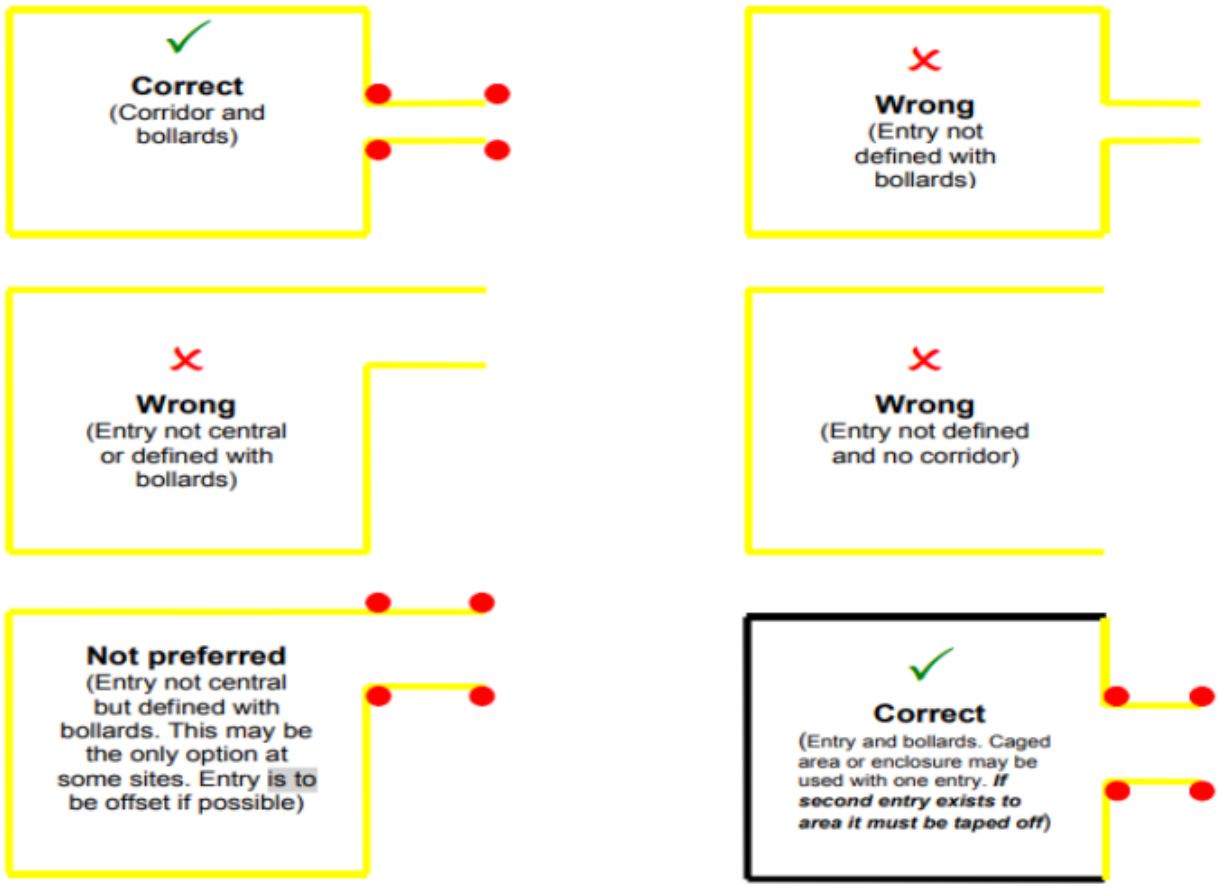


Figure 4. Entries to Access Authority areas in outdoor switchyards

To apply the barrier-in method an Electrical Operator must erect yellow tape around the apparatus covered by the Access Permit(s) to which the tape barrier applies.

The inside of the taped area then defines the safe work area. The barrier-in method must include:

- a single entrance corridor (with a nominal width of 1 to 1.5 metres and length of 1 to 2 metres).
- entrance clearly marked with four approved red high visibility bollards (except when used on indoor metal-clad switchgear, where two bollards are permitted); and
- taped entry corridors which join the main taped work area at right angles with the taped entry located in the centre of a taped boundary side where practicable.

In a small number of situations, the layout of the equipment inside the station may not allow the corridor to be in the center or achieve a right-angle return. In this case, the entry may be readjusted, but it still must be clearly defined by the use of four or more high visibility bollards.

Where yellow tape stands are used to support yellow tape, they must be:

- positioned no greater than 4m apart; and
- weighted down to prevent them being blown over or inadvertently knocked down.

Note: *Due to the layout of the equipment within the high voltage outdoor area or the type of work to be performed, the Barrier Out Method may be used, where all live equipment is taped out. This is shown in Figure 7.*

Indoor metal-clad switchgear

If the barrier-in method is used to identify the safe work area for indoor metal-clad HV switchgear, the entry/exit point may be created using only two entry/exit bollards as shown in Figure 5 below.

Figure 5. Example of switchgear under Access Authority with the Yellow Tape-In Method defining the entry area. Refer to Clause 7.7.4 Descriptions of barriers and signs for correct signage.

7.7.7.2 Yellow tape out method

With the Yellow Tape Out Method, an Electrical Operator must erect a yellow tape barrier in such a way as to provide access to the apparatus which is covered by the Access Permit to which the tape barrier applies and prevent access to all adjacent live apparatus in the station.

Since access is prevented to all adjacent live apparatus, high visibility bollards are not required at the entrance.

Figure 6. An example of the Yellow Tape-Out Method used on indoor metal-clad switchgear

A yellow tape barrier is erected between the equipment covered by the Access Authority and all other energised equipment in the substation. Other access to the energised equipment in the indoor substation or outdoor yard is to be taped off also. Accordingly, any electrical equipment located within or above the yellow taped work area must be safe to work on unless specifically excluded by the Access Authority via a Warning note in the Special Provisions section of the Access Authority Form.

While carrying out the work under the Access Authority, workers must be capable of maintaining the appropriate Safe Approach Distances to any exposed electrical equipment either outside the yellow tape barrier or excluded from the Work Area via a Warning note in the Special Provisions section of the Access Authority Form.

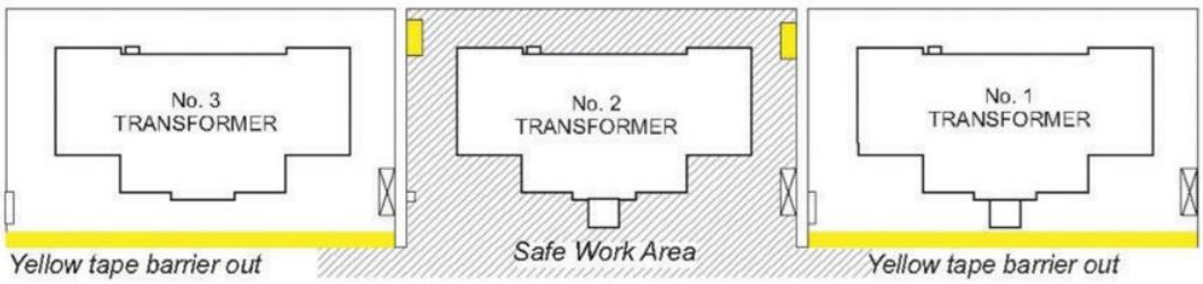


Figure 7. Examples and diagram illustrating correct entry to a safe work area barrier out.

7.7.8 Barriers and signs for sanction for testing

Prior to the issue of a sanction for testing, barriers and signs must be erected:

- to make it clearly evident which electrical apparatus is under sanction for testing, and which is not, and
- to guard against mistaken or inadvertent contact with other electrical apparatus, or equipment under test.

The above must be achieved with the use of appropriate signs and barriers including danger barriers, energised signs and under sanction for testing signs. In positioning signs and barriers consideration must be given to all approaches to the work area.

The electrical operator issuing the sanction for testing must erect the initial yellow tape barriers. They are used to indicate the dividing line between energised electrical apparatus and the electrical apparatus on which it is safe to perform work. Only electrical operators must erect and remove yellow tape barriers.

Danger barriers must be used so as to indicate that equipment under sanction for testing presents an immediate and probable risk of contact with energised electrical apparatus.

The tester in charge must erect danger barriers and ‘Danger High Voltage Testing in Progress’ signs after the issue of the sanction for testing. The provision and positioning of barriers and signs must take into account all likely and unlikely approaches to the work area including remote locations, for example remote ends of cables under test.

Only workers who have signed onto the sanction for testing are permitted to enter the designated test area.

In particular instances where identification is positive, such as on some HV overhead lines and underground cables, and providing appropriate safeguards have been taken, procedures may dispense with the use of barriers and/or signs.

Figure 8. EXAMPLES OF VARIOUS HV APPARATUS WHICH IS TAPED AND/OR DANGER TAGGED TO CONTROL ACCESS TO VARIOUS PARTS OF THE APPARATUS

8 Access for Work On or Near High Voltage Electrical Apparatus

8.1 Principle

All high voltage (HV) electrical apparatus must be considered energised until:

- isolated, tested and proved de-energised, earthed, and short circuited,
- an appropriate safe access system has been applied to allow work to be carried out on or near the HV electrical apparatus, and
- Job Risk Assessments are completed for the types of work to be carried out on or near the HV electrical apparatus.

8.2 General

Access for work on or near high voltage electrical apparatus must be carried out in accordance with Network Access and as per Chart 8.1 General Workflow for High Voltage (HV) Access.

No worker is permitted to touch the HV conductors of any electrical apparatus unless:

- the worker has been acknowledged as an authorised recipient of an electrical access authority or has signed onto an access authority covering that electrical apparatus and the HV conductors have been discharged and/or earthed at the worksite, and the electrical access authority is available for reference at the worksite.
- the worker is a recipient of an electrical access authority covering the conductors of a HV cable and the de-energised state of the cable at the worksite is confirmed in accordance with Section 5 Guidance When Working On or Near Underground Cables, and the electrical access authority is available for reference at the worksite.
- in the case of a rackable circuit breaker or rackable voltage transformer, the electrical apparatus is removed from its rack or cubicle position and placed in a designated maintenance position.
- the worker is working under the terms of a sanction for testing on that electrical apparatus.
- that electrical apparatus has been declared out of commission in accordance with Clause 7.6 Electrical Apparatus out of Commission, or
- The worker is performing Energised HV Line Work in accordance with Live High Voltage Line Manual and Live HV Network Access.

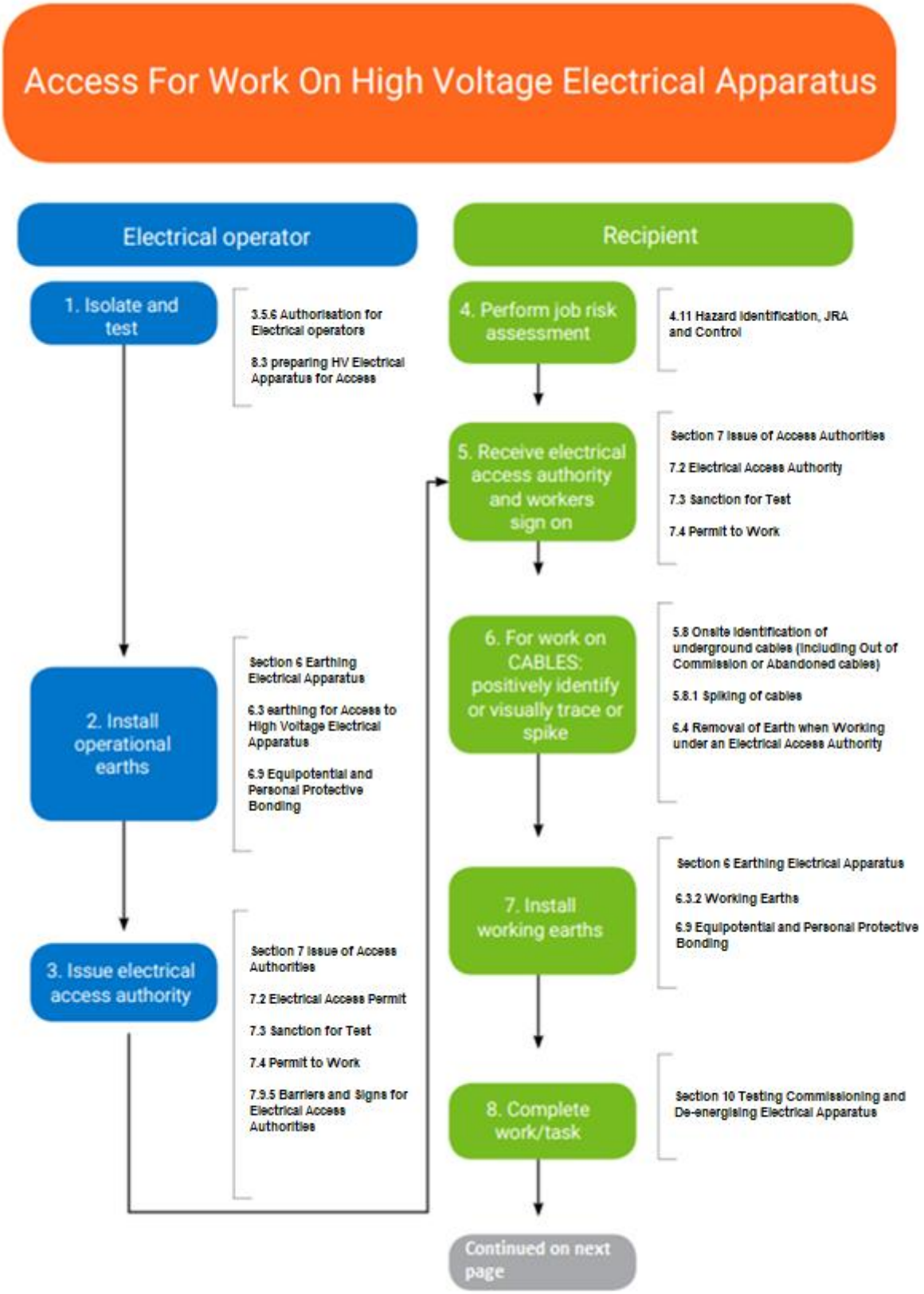
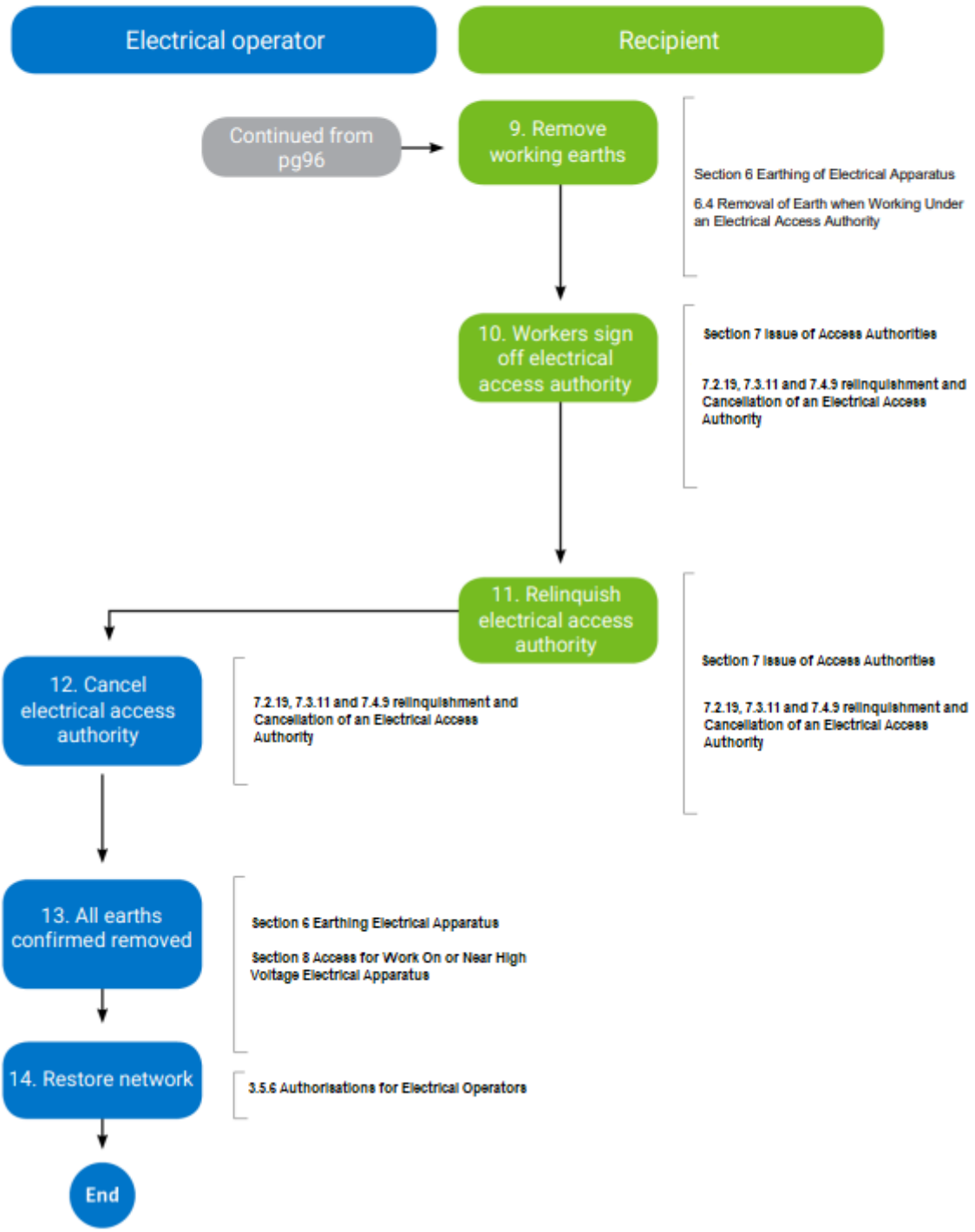


Chart 8.1 General Workflow for High Voltage (HV) Access

Access For Work On High Voltage Electrical Apparatus



8.3 Work On or Near De-Energised High Voltage (HV) Electrical Apparatus

Before work on or near de-energised HV electrical apparatus can begin, an electrical operator must have carried out all of the following in accordance with procedures:

- clearly identified the HV electrical apparatus.
- isolated the electrical apparatus from all possible sources of supply.
- secured the isolation to prevent unauthorised operation by applying danger tags to all points of isolation and applying approved locking devices if there is provision.
- proved de-energised the electrical apparatus – if test equipment is used it must be proved to be in good working order immediately before and after use.
- install or directly supervise the installation of the operational earths and short circuited the electrical apparatus.
- clearly identified the safe area for work, and
- issued an electrical access authority.
- Danger tags, which have been installed by the electrical operator, must only be removed by an electrical operator under the direction of System Control.

8.4 Preparing High Voltage (HV) Electrical Apparatus for Access

8.4.1 Isolation and Earthing – General

HV electrical apparatus should not be regarded as being safe for the issue of an access authority until it has been isolated and operational earths applied. Isolation points must be identified, and danger tagged and secured by locks fitted by an electrical operator.

Consideration must be given to the isolation of sources of supply from LV or secondary circuits including generation sources (for example voltage transformers, transformer back-feeds, motor generator sets, photovoltaic cells, lightning, and induction). Precautions such as isolating a source of supply through an open link switch or fuse link and applying a danger tag are acceptable if application of bonders is not reasonably practicable or safe to do so.

For remote controlled electrical apparatus, workers must confirm that the ‘remote/local’ switch is in the local position, or that the remote control has been made inoperative by other approved means, before starting work on the electrical apparatus.

As appropriate remote-switching points should be danger tagged and/or SCADA tagged. These include the System Control SCADA system and zone substation mimic panels.

Isolation for access must either be visible, or an approved test undertaken to confirm that the electrical apparatus is de-energised. Such isolation may not eliminate the effects of electrical or magnetic induction.

Earths must be applied as in Clause 6.4 Earthing for Access to High Voltage (HV) Electrical Apparatus.

8.4.2 Isolation of High Voltage (HV) Electrical Apparatus for Access

8.4.2.1 Interconnected Low Voltage

Access to HV electrical apparatus connected to substations with interconnected LV must be based on the following concepts:

Where the HV electrical apparatus being isolated and earthed is capable of being energised from LV electrical apparatus by direct switching or bridge connections, that LV electrical apparatus must be considered as a source of supply. Isolation from that LV electrical apparatus is part of the access procedure, and each isolation point must be danger tagged and recorded on the access authority.

- Bonding of conductors between the work area and the LV source.
- If bonding is not reasonably practicable then an isolation with two points (a double break) in series must be made:
  - to have an open link switch, or
  - open circuit breaker, or
  - open fuse link, and
  - a danger tag applied.

- A racked-out circuit breaker and danger tag applied is a double break.
- Working with insulated contact only.

8.4.3 Embedded generation

In order to protect workers against inadvertent back feed from embedded generating units or alternative sources of energy such as photovoltaic cells, the following factors must be considered whilst planning for and preparing electrical apparatus for access:

- the danger of activation of both HV and LV assets from temporarily connected motor-generator sets or alternative sources of energy such as photovoltaic cells, or
- embedded generating units may be connected at any time and at any place during the progress of work, or
- the impracticability of isolation to completely eliminate such a risk, or
- the application of earths, short circuits, and bonds, as appropriate on all sides of the work location will minimise the effect of inadvertent back feeding.

Typical examples given in this clause might not cover all possible sources of supply such as back feeds. Note: Only approved means of bonding is to be used where reasonably practicable, and isolation of embedded generation systems (Total system capacity less than or equal to 15 kVA single-phase / 30 kVA 3-phase) is not required outside of the bonded worksite.

8.4.4 Isolation by non-withdrawable switch

Where the only means of isolating HV electrical apparatus from a source of supply is by a switch, which cannot be withdrawn and in which the actual disconnection is not visible, the isolation must be regarded as satisfactory for the purpose of carrying out work provided that the switch position indicator shows that the switch is in the earthed position and the switch is locked manually. The locking device must only be removed by the operator.

If the switch is a gas switch that does not have an earth position and cannot be locked in the open position, the isolation must be regarded as satisfactory for the purpose of carrying out work provided that the switch position indicator shows that the switch is open, and a set of operational earths is installed immediately adjacent to the switch.

A switch that uses a vacuum interrupter alone is not an acceptable form of isolation.

Where the switch has a local/remote function then the remote function must be disabled in accordance with Clause 8.4.1 Isolation and Earthing – General.

8.4.5 Isolation for test purposes

Isolation of HV electrical apparatus by making the break in the circuit under oil, SF6 gas, vacuum or air is not suitable for the application of HV for test purposes or for insulation resistance testing (> 2500V).

Nor is it a satisfactory form of isolation if work is to be carried out with the earth and short circuit removed at this point of isolation. A second break in the electrical circuit, in a different switching chamber, is required.

This is commonly called a double break. The double break is required in separate switchgear units.

Where isolation of HV electrical apparatus is to be provided for the application of HV for test purposes, and such isolation requires the removal of switchgear panels to enable the connection of test leads to the circuit to be tested, there must be an earthed metal screen or barrier between the test circuit and any energised busbars within that switchgear.

8.4.6 Isolation for cable termination work

Where cable termination work is to be performed on HV electrical apparatus, which requires the removal of cable box panels, there must be an earthed metal screen or barrier between the cable circuit terminals and any energised busbars within that switchgear.

8.4.7 Apparatus without an earthed metal sheath

HV electrical apparatus which has been insulated with tape, rubber, plastic, or other insulation, but has not been covered with an earthed metal sheath or screen is not effectively insulated and must be treated as exposed.

8.4.8 High Voltage (HV) metal-clad switchgear and associated electrical apparatus

For the purpose of issuing an access authority, a circuit breaker or a voltage transformer may be regarded as isolated and at earth potential when it is racked out and appropriate precautions taken to prevent re-energisation, refer to Clause 8.2 General.

For work on busbar circuits in equipment and adjacent to live parts, an existing earthed metallic barrier must separate the work from the live parts. The barrier must mitigate the risk of electric shock and arc-flash. If the barrier does not exist, or mitigates the risks, adjacent equipment must be de-energised.

The proposed means of access within metal-clad chambers must be described to the electrical operator by the recipient and both must agree on the extent of access and that such access is safe.

When access is required within spout bushings the contacts must be confirmed as de-energised by an approved test. The circuit must also be earthed elsewhere, or other precautions taken to ensure that the spout contacts cannot become energised by induction or other means.

When it is not reasonably practicable to earth metal-clad circuits a job risk assessment must be conducted to determine the special precautions, including discharging, to ensure that the conductors can be regarded as isolated and earthed. The isolation and identification of the unearthed circuit must be checked by more than one electrical operator.

8.5 Suppression of Auto-Reclose on HV Feeders

The auto-reclose function on HV overhead feeders must be suppressed:

- when any HV switching operations are in progress.
- on total fire ban days.
- when glove and barrier and/or stick electrical workers are carrying out work on energised HV electrical apparatus and/or conductors, or
- when authorised vegetation management workers are cutting vegetation in the vicinity of energised HV overhead electrical apparatus and/or conductors in accordance with Clause 2.4.2 Safe Approach Distance – Vegetation Clearing – General.
- When excavation works are being carried out in close proximity to HV UG cables.

8.6 High Voltage Live Work

- High Voltage Live Work must only be undertaken after first performing a switching needs assessment to determine whether the work should be conducted under isolated and earthed conditions or whether the work can be performed under energised conditions by appropriately trained, skilled and authorised persons.
- The safe approach distances for glove and barrier workers are shown in Table 8.1 Safe Approach Distance (mm) to Energised Conductors for authorised Glove and Barrier Workers.
- Before energised work is undertaken a job risk assessment must confirm that the work can be performed safely.
- Work on or near exposed energised HV conductors must be performed by an authorised glove and barrier worker in accordance with **Live High Voltage Line Manual** and **Live HV Network Access**.

A written application using the work request form must be completed for all pre-arranged live line access requirements. All such applications must be submitted to System Control.

- The auto-reclose function on HV overhead feeders must be suppressed when glove and barrier and/or stick work is carried out on energised HV electrical apparatus and/or conductors.

8.7 HV Live Line Work Safe Approach Distances

Table 8.6 Safe Approach Distance (mm) To Energised Conductors For authorised HV Live Line Worker		
11kV – 22kV	**Stick**	**Glove and Barrier**
HV Live Worker	400	Contact with gloves and sleeves. 50 (11kV) 100 (22kV) between the uninsulated part of the body and the live apparatus.
HV Live Worker MEWP Insulated Section	250	250 from uninsulated conductors or contact with insulating covers
HV Live Worker MEWP and mobile plant uninsulated section (to uninsulated conductor)	700	700
Live line mobile MEWP and mobile plant uninsulated section (to insulated conductor)	400	400
Mobile plant load (for example pole) double insulated where the load is insulated, and the conductors are insulated	400	Inadvertent contact
Insulated lifting equipment (insulated to twice the voltage)	Contact	Contact
Uninsulated lifting equipment (to insulated conductor)	400	400
Uninsulated lifting equipment (to uninsulated conductor)	700	700
Phase-to-phase distance (distance to be maintained between phases when moving conductors)	450	450
Tool insulation distance (hand sticks)	450	450

Notes

1. When using an Insulated Mobile Elevating Work Platform (MEWP) or insulated platform between circuits:
   - a minimum of 250mm clearance must be maintained between the basket of the MEWP and the lower circuit, this includes aerial earths, catenary cable, pay television and any other conductive mediums, or
   - when insulating barriers rated for the higher voltage are fitted to the lower circuit contact can be made with the covers.
2. If MEWPs are utilised for energised HV work:
   - when one is used only one phase at a time may be worked, or
   - when two MEWPs are used two phases may be worked simultaneously provided a minimum separation of 2m between the baskets and the booms of the MEWPs is maintained, or
   - when two MEWPs are used on the same phase the minimum separation of 2m is not required, or
   - no physical contact between workers must be made, or
   - Tools or equipment must not be passed between baskets while working in close proximity. Care must be taken to ensure that the work of one person does not compromise the clearance for isolation of another.
3. Mobile plant being used must be operated under the direction of an authorised live line worker.

8.7.1 Special Approach – Mobile Plant

When working under glove and barrier procedures, special safe approach distance may be applied where a safety observer is used. Conductors and loads must be suitably insulated, and every effort made to avoid inadvertent contact with the conductors as per Live High Voltage Works Manual.

The person in control of the work must, through all workers engaged in the work, ensure compliance with the special approach distances for mobile plant/lifting equipment and the following general requirements for all the work situations covered in these rules, including:

- pole structures carrying energised circuits must be checked to ensure that they are in a safe condition prior to the commencement of any work,
- suppression of auto-reclose,
- a safety observer must be appointed,
- for all work, either specific work instructions must be issued or alternatively, Evoenergy's procedures must apply, and
- an appropriate job risk assessment must be undertaken before work is performed.

Pole structures may be lifted between exposed energised LV conductors under direct supervision of the person in control.

8.8 Glove and Barrier and/or Stick Work and Access Authority

Glove and barrier and/or stick work and work under an access authority must not be performed concurrently on a structure.

If it is necessary to change between glove and barrier and/or stick work and to work under an access authority, a clear transition point must exist. All workers must be aware that the change process is occurring and act accordingly.

At all times access authority isolations must remain unchanged.

No glove and barrier and/or stick work must be carried out concurrently at over/under crossings of apparatus under access authority as the gap between the over/under crossing could be compromised.

8.9 Minimum Requirements for Live Line Work

The minimum requirements for undertaking live line work must include:

- The workers performing live line work, and the appointed safety observers, must be authorised glove and barrier workers.
- the appointment of a safety observer where their sole duty must be to observe the work being undertaken.
- that the workers performing live line work must wear and use appropriate rated and tested devices and PPCE, and
- The work must be performed in accordance with Live High Voltage Line Manual and Live HV Network Access.

When undertaking live line work, the job risk assessment must consider as a minimum:

- The electrical apparatus' condition, for example, the soundness of structures/conductors on either side of the structure to be worked on or the integrity of the insulators.
- proximity of other electrical apparatus, for example potential second points of contact and drop zone considerations.
- proximity of earthed equipment and structures.
- protection and control settings, for example auto reclose suppression.
- work environment, for example heat, light, or weather conditions.
- estimated conductor weights and loadings, both electrical and mechanical, and
- working from multiple mobile elevating work platforms (MEWP).

8.10 Energised High Voltage (HV) Work Methods

8.10.1 High Voltage (HV) Energised-Line (Hot Stick) Work

An authorised glove and barrier and/or stick worker may access energised HV conductors using insulating sticks at the safe approach distances as shown in Table 8.1 Safe Approach Distance (mm) to Energised Conductors for authorised Glove and Barrier Workers.

8.10.2 Glove and Barrier Energised-Line Work

An authorised glove and barrier and/or stick worker may make insulated contact with an energised HV conductor up to and including 33kV when fully insulated from earth and other phases using approved and tested personal protective equipment and insulating devices.

Glove and barrier work must never be performed directly from a structure.

8.11 Use And Testing of Operating and Energised-Line Equipment

All sticks, gloves, sleeves, mats, protective barriers or covers, earthing devices, insulating platforms, insulated elevating work platforms or other equipment used for operating HV electrical apparatus or performing energised-line work must be specifically approved for the particular application.

Test intervals should not exceed 12 months. More frequent testing may be required depending on usage and the work environment. Equipment must be marked to show the date of the next routine test. Equipment must not be used after the marked test date and tagged out as per Lock Out Tag Out Procedure until retested.

Gloves, sleeves, mats, and protective barriers or covers used for operating HV electrical apparatus or for performing glove and barrier work must not be relied upon as the sole means of insulation.

There must be at all times two forms of insulation.

9 Access to Low Voltage Electrical Apparatus

9.1 Principle

All low voltage (LV) electrical apparatus must be regarded as energised until:

- isolated, tested and proved de-energised.
- appropriate safe procedures of work are established for work on the LV electrical apparatus.
- job risk assessments are completed for the types of work to be carried out on or near the LV electrical apparatus.

9.2 General

Access for work on low voltage electrical apparatus must be as outlined in Chart 9.1 General Workflow of Low Voltage (LV) Access.

Workers required to work on or near LV electrical apparatus must be appropriately trained and authorised in accordance with Clause 3.5 Authorisation framework, and Clause 4.16 Perform Rescue.

System Control must be informed of all work intended on the LV electricity network both energised and de-energised.

Prior to an LV switching operation the available information regarding circuit conditions must be taken into account.

All conductors must be assumed to be energised until tested. This includes new conductors which may have never been energised.

After switching, the correct operation of the electrical apparatus must be confirmed.

Network and service cables that have a fault identified are to be de-energised and danger tagged until repaired.

9.3 Temporary Supply of Electricity

All connections to obtain temporary LV supply must be made only through approved devices issued for the purpose.

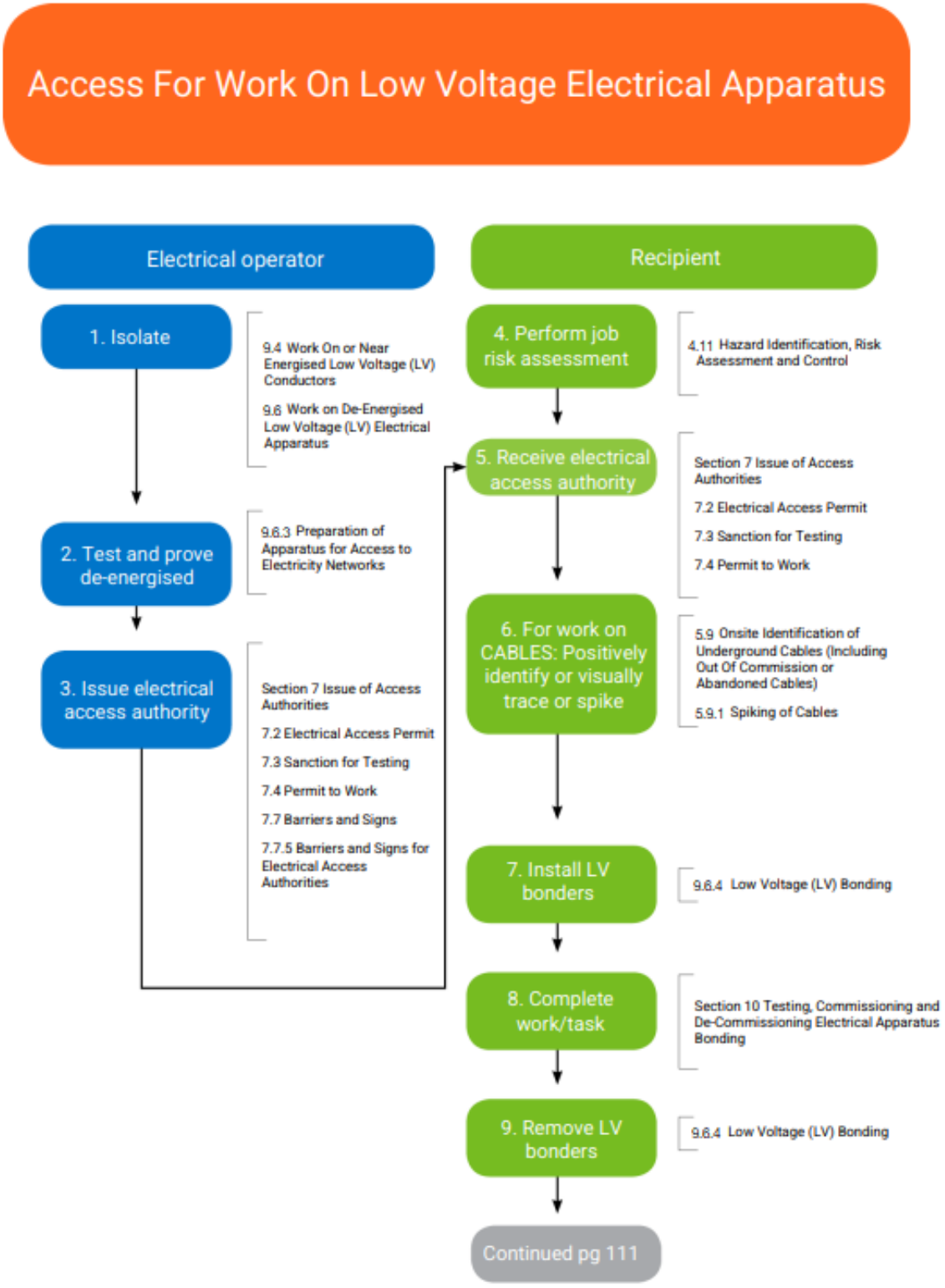


CHART 9.1 GENERAL WORKFLOW OF LOW VOLTAGE (LV) ACCESS

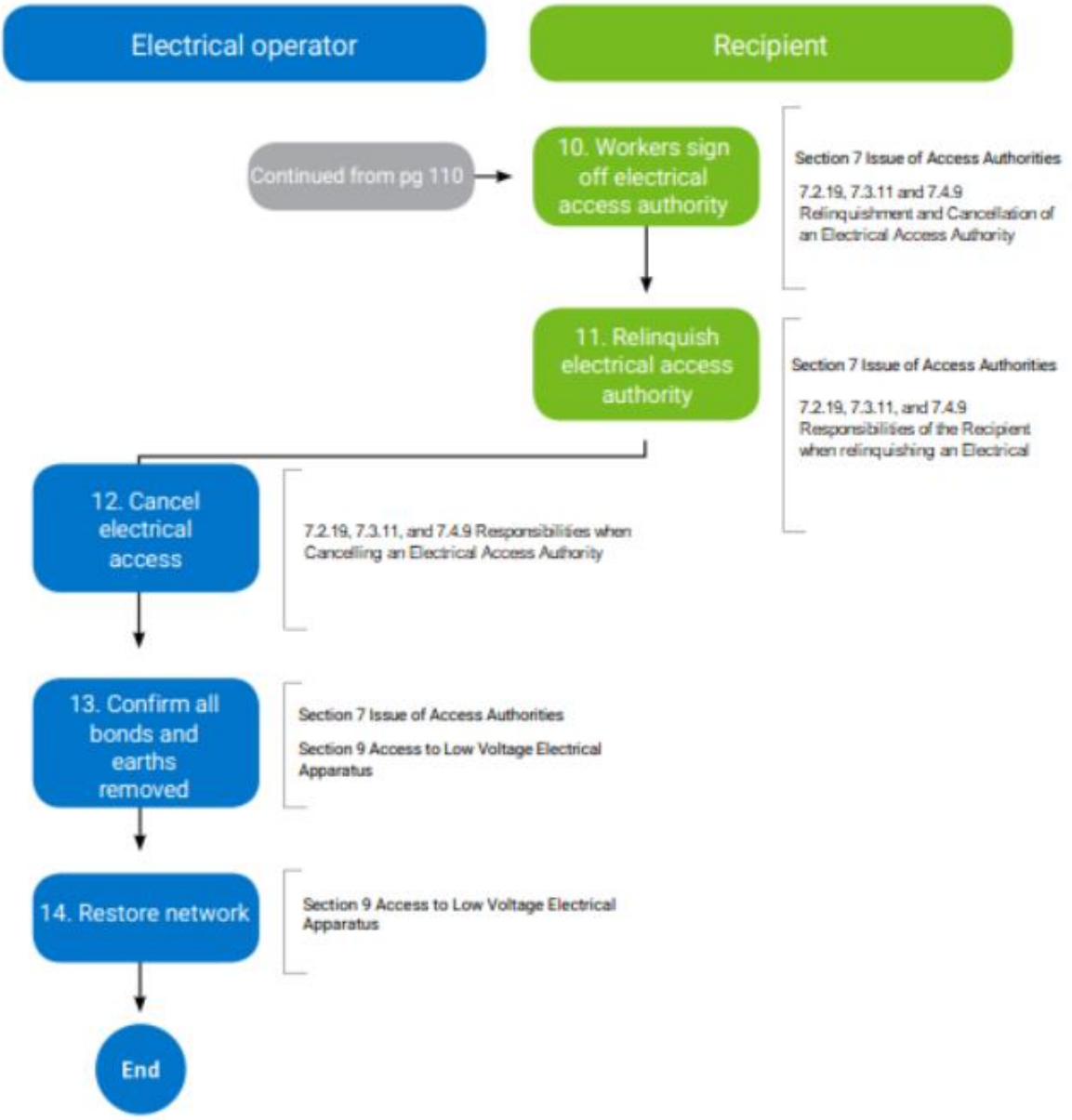


CHART 9.1 GENERAL WORKFLOW OF LOW VOLTAGE (LV) ACCESS

9.4 Work On Or Near Energised Low Voltage (LV) Conductors

9.4.1 General

When work is to be carried out on or near energised LV electrical apparatus, approved precautions or energised working techniques must be taken to prevent simultaneous contact with conductors or conducting objects at different potential unless all conductors are de-energised.

Energised work should only be undertaken after first performing a switching needs assessment to determine whether the work should be done under isolated conditions or whether the work can be performed under energised conditions by appropriately trained, skilled and persons authorised to Work On in accordance with Energised Low Voltage Works Manual.

Before working on or near energised LV conductors, a job risk assessment must be conducted to assist in the identification and control of hazards to ensure that the work can be performed safely. The job risk assessment must consider as a minimum:

- the condition of the electrical apparatus, for example the soundness of structures, conductors, and insulators.
- proximity of other electrical apparatus, for example potential second points of contact.
- proximity of earthed equipment and structures including communications cables/catenary, equipment and carriers, pillars and pits, public lighting, and fittings.
- work environment for example heat, light, weather conditions.
- use of appropriately rated clothing and equipment, and
- the use of insulated barriers, mats and covers.

When insulating gloves are required, they must be worn on both hands with mechanical protection (outer gloves) and visually inspected prior to each use to ensure the integrity of the glove, for example checking for small holes that compromise the integrity of the glove and such the safety of the worker.

In wet weather conditions leakage currents may flow in equipment and structures supporting energised LV circuits. Temporary insulation, insulating gloves and other suitable personal protective clothing must be used when working on, or within reach, of such equipment and structures.

Each worker must ensure that they are aware of the:

- requirements of the work instruction.
- work to be done by the workers.
- work they are to perform.
- PPCE, tools and equipment.
- precautions to be taken, and
- work method/s to be used.

A safety observer must be used when a worker is working on or near energised exposed LV electrical apparatus in accordance with Clause 4.24 Use of Safety Observers.

9.4.2 Insulation/Covering of Conductive and Earthed Structures

All conductive and earthed structures/objects within reach, including exposed conductors (except the conductor being worked on), must be shielded by approved covers.

- Conductive and earthed structures/objects include:
- conductive poles for example concrete, steel and stobie poles.
- installed earthing metal components on wooden poles.
- stays, operating pipes, earthing down leads.
- catenary wires of communications cables.

- streetlight conductors and switch circuits, streetlight fittings and brackets.
- fittings in mini-pillars/link-pillars or underground pillars and pits, and
- POAs/POEs and riser brackets.
- Actions to be considered are:
- without requiring a deliberate movement or overreach.
- by accident.
- while changing position.
- while making movements in the ordinary course of work, or
- while fastening or unfastening a body belt/harness.

Approved covers include electrical workers rubber mats and other tested insulating devices. Covers must be used liberally, secured in place, and repositioned as necessary throughout the job.

Workers need to pass between energised LV conductors spaced less than 1200mm apart, the conductors must be insulated (either permanently or temporarily) whenever they are in reach.

Where it is not reasonably practicable to cover any conductor or conducting object (for example in mini-pillars, link-pillars, underground pillars, or pits), special precautions must be taken to prevent contact with the conductor or object by the use of barriers.

LV electrical apparatus covered by tape, rubber, plastic, or fabric, including cables and service wires exposed to ultraviolet (UV) deterioration, must be regarded as exposed conductor.

9.5 Notification Of Work On De-Energised Low Voltage (LV) Electrical Apparatus

Before making an application for planned LV access the person in control of the work must establish that the proposed work has been properly planned and can be carried out safely. Consideration must be given to:

- work method.
- work environment.
- the skills and authorisations of the workers.
- how to energise and test after completion of work, and
- Safety outcomes of completed work.

The electrical apparatus to be covered and its location must be accurately defined, and the work to be undertaken adequately described.

9.6 Work On De-Energised Low Voltage (LV) Electrical Apparatus

9.6.1 General

Where work is to be done on LV electrical apparatus under de-energised conditions an Electrical Access Authority must be issued. Figure 9.1 Low Voltage (LV) Network Topography and Permit Requirements and Chart 9.1 General Workflow for Service Access must be followed.

All LV service conductors less than or equal to 50mm2 and not requiring isolation of LV mains may be excluded from the requirement for an Electrical Access Authority. Refer to 9.6.2 Access to Services. System Control must be notified prior to, and at the completion of work.

When connecting de-energised electrical apparatus to an energised LV source of supply, the neutral conductor must be connected first before the final connection to the source of supply.

When disconnection is being made, the connections at the source of supply must be disconnected first. The neutral conductor must be disconnected last.

All LV uninsulated conductors and electrical apparatus must be regarded as energised until isolated, tested and proved de-energised by electrical workers using approved testing devices before commencement of work.

LV bonders must be applied where reasonably practicable by the recipient or by persons authorised to Work On under their supervision in accordance with Clause 9.6.4 Low Voltage (LV) Bonding.

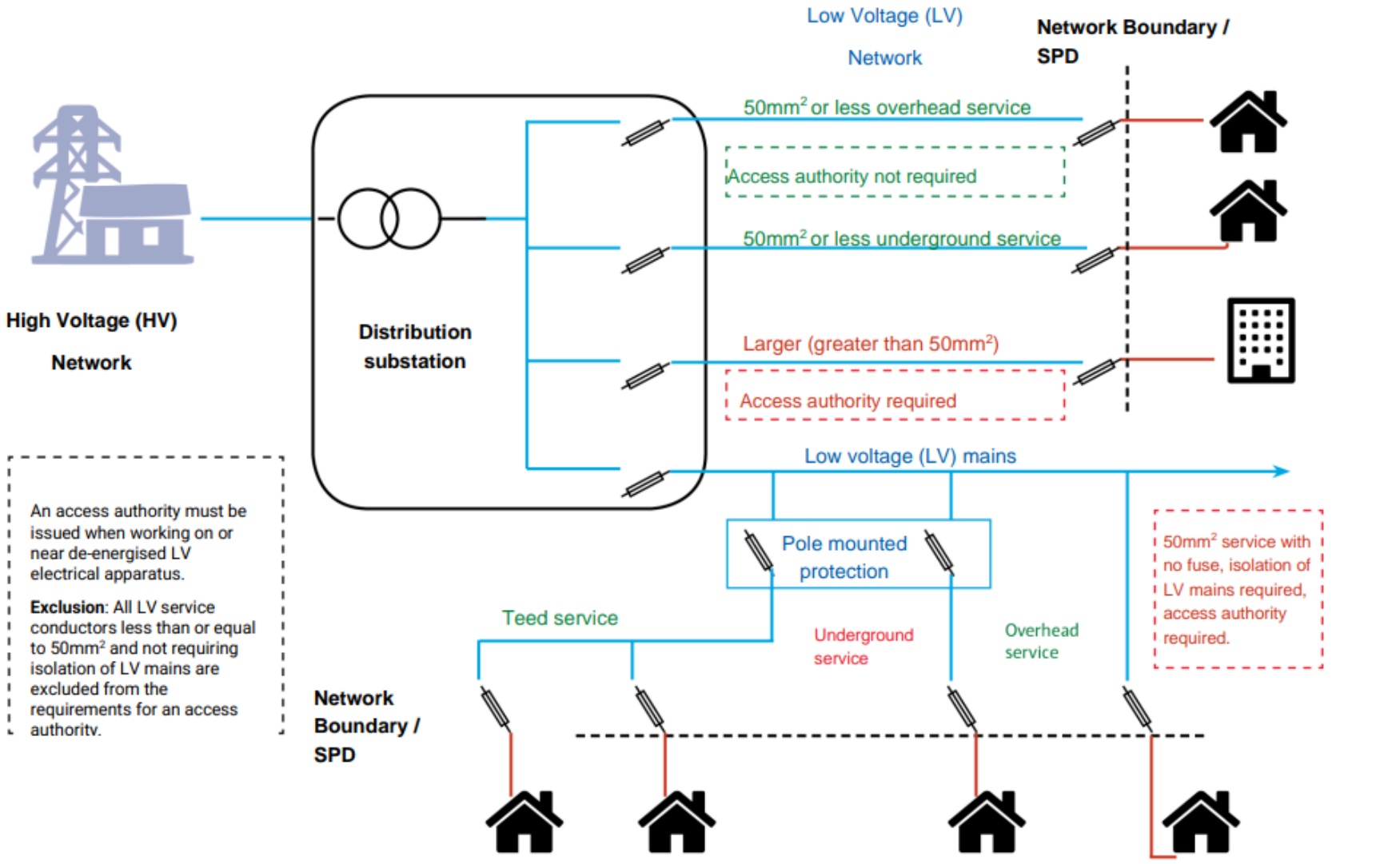


FIGURE 9.1 LOW VOLTAGE (LV) NETWORK TOPOGRAPHY AND PERMIT REQUIREMENT

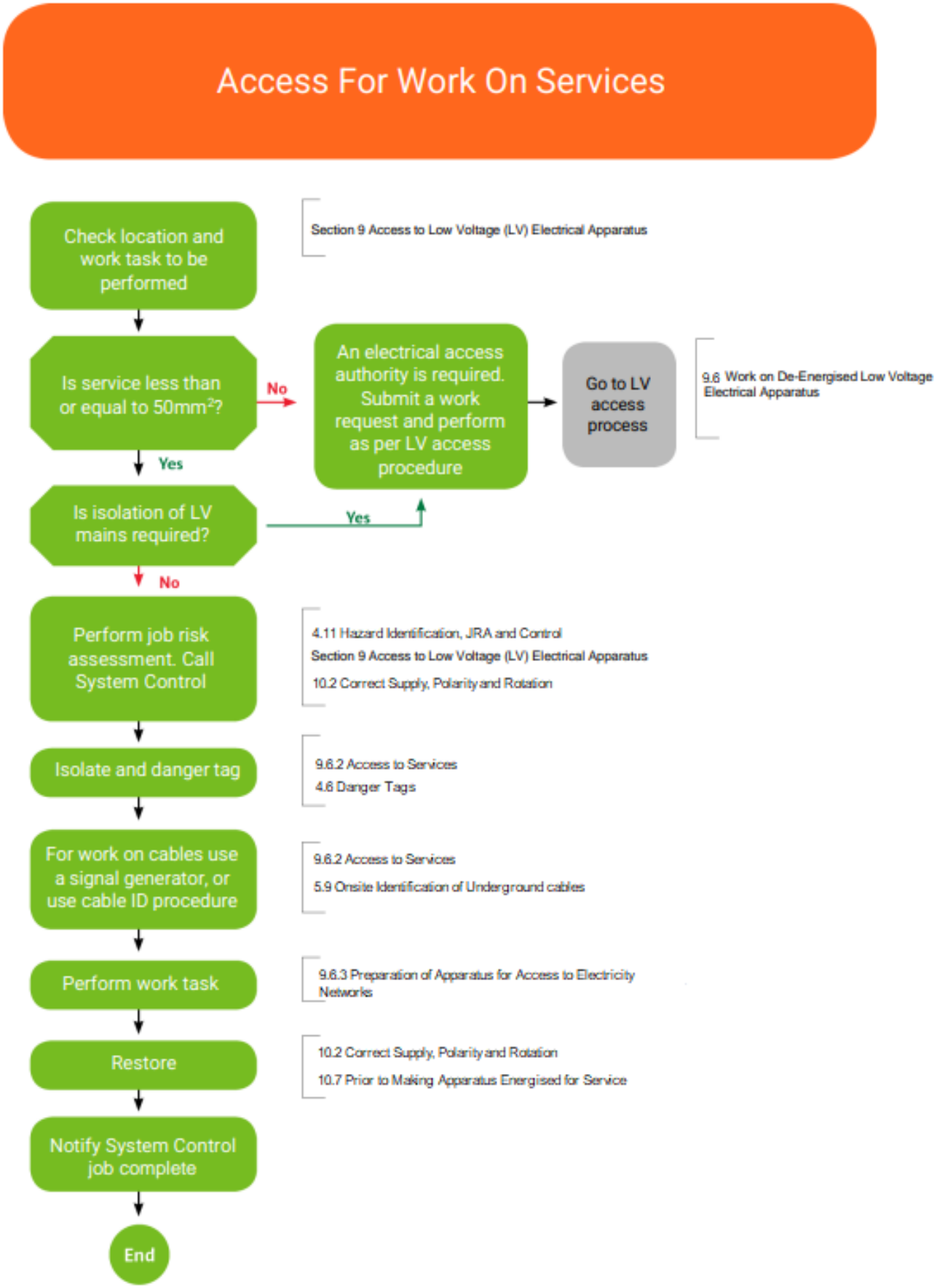


CHART 9.2 GENERAL WORKFLOW FOR SERVICE ACCESS

9.6.2 Access to Services

Where work is to be performed on services and an electrical access authority is not required, the point of isolation must be danger tagged or appropriately flagged.

Service cable identification may be performed by use of a signal generator or other approved test as described in Clause 5.2 on Underground Network, Service or Supervisory (SCADA) Cables.

9.6.3 Preparation of Apparatus for Access to Electricity Networks

Before work on or near de-energised LV electrical apparatus can begin, an electrical operator must have carried out all of the following in accordance with procedures:

- clearly identified the LV electrical apparatus.
- isolated the electrical apparatus from all possible sources of supply, including embedded generating units and customer power factor correction capacitors, and (Note: Isolation of small, embedded generation systems with a total system capacity less than or equal to 15 kVA single-phase / 30 kVA 3-phase) is not required outside of the bonded worksite).
- secured the isolation to prevent unauthorised operation by applying danger tags to all points of isolation and applying approved locking devices where reasonably practicable to do so.
- tested and proved that the electrical apparatus is de-energised.
- clearly identified the safe work area using appropriate barriers and/or signs, refer to Clause 7.7 Barriers and Signs, and
- issued an electrical access authority.

Danger tags, which have been installed by an Electrical Operator, must only be removed by an Electrical Operator under the direction of System Control.

The procedure for Access Authorities for work or testing on LV electrical apparatus must be as detailed in Clause 7.2 Electrical Access Permit and Clause 7.3 Sanction for Testing.

The principles outlined in Clause 7.6.2 Electrical Apparatus out of Commission, and Clause 7.7 Barriers and Signs also apply to LV work.

Electrical apparatus must be tested and proved de-energised by means of an approved testing device. The test equipment must be proved to be in good working order immediately before and after use.

When newly constructed conductors reach a state whereby, they are electrically connected, access to those conductors must only be under an Electrical Access Permit or applying approved energised LV Energised Low Voltage Works Manual.

De-energised LV cables must be identified at the worksite and proved de-energised in accordance with procedures, refer to Clause 5.2 Working on Underground Network, Service or Supervisory Cables (SCADA).

Precautions against induced and transfer voltages must be in accordance with Clause 5.5 Inducted Voltages and Transferred Earth Potentials

9.6.4 Low Voltage (LV) Bonding

Consideration must be given to protection from other sources of supply such as embedded generating units, photovoltaic cells, lightning, induction etc.

Where reasonably practicable, the application of bonders at the worksite will minimise the effect of inadvertent energisation from alternative energy sources. Only approved means of bonding must be used in accordance with the **Earthing Construction Manual Volume 4 - LV Portable Earthing and Bonding** by an appropriately trained worker as deemed by Evoenergy.

Before the appropriately trained worker makes contact with bare conductors of the electricity network, which have been isolated for the purpose of facilitating work under de-energised conditions, they must complete prove de-energised test in accordance with **Low Voltage Cable and Apparatus Testing Manual** and where reasonably practicable, the conductors (all phases plus neutral) must then be bonded at the worksite in accordance with the

Earthing Construction Manual Volume 4 - LV Portable Earthing And Bonding.

Where reasonably practicable, the bonders should be applied after the access authority is issued. Either the electrical operator or the appropriately trained workers can apply the initial bond. The electrical operator must ensure the placement and removal of low voltage bonders on ground mounted assets are accurately recorded on the Electrical Access Permit for the information of the recipient. The recipient of the access authority must ensure that all bonders are removed by an appropriately trained worker before relinquishment of the access authority in accordance with the Earthing Construction Manual Volume 4 - LV Portable Earthing and Bonding.

In cases where bonding is not reasonably practicable, conductors and apparatus must be treated as energised and only insulated contact can be made. This must be noted in the job risk assessment.

10 Testing, Commissioning and Decommissioning Electrical Apparatus

10.1 Principle

Electrical apparatus must not be placed into service until it has been cleared for service.

10.2 Correct Supply, Polarity and Rotation

Before an installation neutral is connected to the electricity network supply neutral, both must be identified and confirmed by test.

Electrical apparatus and/or conductors must be visually identified before connections to the supply system are made. Service polarity, phase rotation and neutral continuity testing must be carried out in accordance with **Evoenergy Low Voltage Cable and Apparatus Testing Manual** to ensure that the conductors have been correctly identified and connected.

The hazards of a transposed active and neutral supply connection (for example reversed polarity) and/or a high impedance supply neutral will cause the installation neutral and earthing system, including earthed metal parts of equipment to become energised.

10.2.1 Connecting and Disconnecting the Neutral Conductor

The neutral conductor must be connected before any active conductor is connected.

(REMEMBER - “first to make last to break!”)

The neutral conductor must be disconnected after all active conductors have been disconnected.

10.3 Use of Testing Devices

10.3.1 Tong or Clip-On Testing Devices

Tong or clip-on testing devices are generally used on LV conductors.

Specially designed tong testing devices provided for the purpose may be used on exposed HV electrical apparatus.

In either case a worker must not use tong or clip-on testing devices unless they have been instructed in the precautions to be observed in their use. If possible, the testing devices must be applied to the conductors where insulated parts exist rather than to an exposed part of the conductor.

In particular the worker must:

- not regard the insulation on the handles of the testing device as sufficient protection. The use of insulating gloves and/or mats as applicable must be taken where it is necessary to apply the testing device to an exposed conductor, and
- When the testing device is applied to an exposed conductor, take care to prevent the testing device from making contact with other exposed conductors or conducting materials. Suitable insulating screens must be used where necessary.

10.3.2 Application of Test Voltages

10.3.2.1 Voltage Less than or equal to 2500V

Services

Application of test voltages on services can be conducted without an access authority on condition that the worker must neither use insulation resistance testing on, nor apply low voltages for test purposes to, any electrical apparatus unless they have warned all workers working on the electrical apparatus of the proposed test. They must have received assurances that everyone will stand clear of such electrical apparatus during the test. On completion of the test the electrical apparatus must be discharged.

Electricity Network

Application of test voltages on electrical apparatus must require an electrical access permit unless the apparatus is 'out of commission.'

A recipient of the electrical access permit must neither use insulation resistance testing on, nor apply low voltages for test purposes to, any electrical apparatus unless they have warned all workers working on the electrical apparatus of the proposed test. They must have received assurances that everyone will stand clear of such electrical apparatus during the test. On completion of the test the electrical apparatus must be discharged.

10.3.2.2 Voltages greater than 2500V

Electricity Network and Services

Application of test voltages >2500V must require a sanction for testing authority unless the apparatus is 'out of commission.'

The tester in charge of test voltages >2500V must ensure that appropriate controls are in place to prevent a person from being exposed to any part of the electrical apparatus under test. Danger High Voltage Testing in Progress signs must be displayed where such electrical apparatus could become exposed and accessible to workers. They must have received assurances that everyone will stand clear of such electrical apparatus during the test. On completion of the test the electrical apparatus must be discharged and earthed.

Isolation for tests >2500V including cable fault location and insulation resistance testing must not be regarded as satisfactory in reliance upon a single break under oil, air, gas, or vacuum, refer to Clause 8.4.6 Isolation for Test Purposes.

Note: Application of test voltages on electrical apparatus not electrically connected to the electricity network, for example in a workshop or a yard environment, can be completed without an access authority but the person in control must ensure that barriers are installed, warning notices are displayed and must have received assurances that everyone will stand clear of such electrical apparatus during the test and on completion the electrical apparatus is discharged.

10.4 Clearance for Service

System Control must not consider new, changed or previously out of commission electrical apparatus as being available for service until it has been handed over from the constructing or maintaining authority by written notification.

The appropriate notification to System Control must be by means of the Electrical Network Alteration Advice (ENAA) form in accordance with the ***Connection and Modification of Network Elements*** procedure.

In cases of electrical apparatus replacing like apparatus at the same location, the appropriate procedure for handing over from the constructing or maintaining authority must include oral advice to System Control.

Associated with advice to System Control must be the completion of, and reporting on all required pre-commissioning and commissioning tests.

10.5 Connections To Electrical Apparatus

Before any electrical connection of new, changed or previously out of commission electrical apparatus can be energised, either by direct switching or by energising other electrical apparatus, the person in control of the work must:

- notify System Control of the intention to make such connection.
- warn all workers associated with the work, and any others likely to be affected, that no further work on the electrical apparatus is permitted, and
- arrange for the issue of an electrical access permit or sanction for testing on the appropriate electrical apparatus to enable the connection to be made.

10.6 Work On Pilot Cables

Workers working on pilot cables must be insulated to 15kV isolation from the local earth, within zone substations. Pilot cables must be treated as 'energised' LV until all cores being worked on are proved de-energised at the worksite. Precautions against induced and transfer voltages must be in accordance with Clause 5.12 Induced Voltages and Transferred Earth Potentials.

10.7 Prior to Making Apparatus Energised for Service

Before making any electrical apparatus energised, System Control through the electrical operator or submitted commissioning clearance documentation must ensure that:

- in case of new electrical apparatus, all the necessary Electrical Network Alteration Advice forms are in the possession of System Control and the electrical operator.
- any electrical access authority, or other document restricting the electrical apparatus to a deenergised state have been cancelled.
- The results of any pre-commissioning tests required to be carried out on the electrical apparatus (for example earth test, insulation resistance test, rotation/phasing) are satisfactory and recorded.
- The following cables must be insulation resistance tested prior to energisation in accordance with the Low Voltage and/or High Voltage Cable and Apparatus Testing Manual:
  - all new cables,
  - cables associated with fault conditions,
  - cables out of service for more than seven (7) days, excluding 132kV cables and cables wholly within Zone substations, Chamber Substations or other Evoenergy controlled spaces.
- all new or repaired HV cables between the zone substation and the first switching point must be HV tested prior to energisation in accordance with the High Voltage Cables and Apparatus Testing Manual
- all earths are removed.
- A visual inspection shows that to all appearances the electrical apparatus is ready for service.
- the labelling and numbering of all the electrical apparatus to be energised has been completed.
- the network configuration (for example HV feeder circuits, substation transformers, LV circuits) are isolated to prevent unintentional energisation of electrical apparatus and switching points are open to allow progressive and stage energisation of circuits (for example not to energise an entire suburb development with one operation).
- 'Warning energised' signs are attached to electrical apparatus where appropriate, and
- backfilling or appropriate fencing with a minimum of 100mm of sand covering of underground cables and joints is completed prior to energisation.

11 Work in Electrical Stations

11.1 Principle

On entry or exit to any electrical station all workers must adhere to correct entry and safe working practices in the electrical station.

11.2 Entry of Electrical Stations

No worker must enter an electrical station or enclosure containing HV electrical apparatus unless:

- The worker is authorised to enter electrical stations to perform work on or near the network.
- the worker is authorised to enter electrical stations and has approval to carry out non-electrical network specific tasks within their training and qualifications, or
- a Supervised Worker has been instructed and is directly supervised at all times by a person authorised to Enter Electrical Stations and the work is within their training and qualifications, and
- all persons and/or workers are aware of the hazard, risks, and controls for the electrical station, including safe approach distances. All persons must make themselves aware of any emergency procedures, warning signs or other relevant information that is displayed in the electrical station.
- All persons and/or workers must sign onto a job risk assessment and follow the conditions of any access authority. All consideration must be made to any special requirements of indoor, basement and underground stations.

When entering electrical stations where alternative exits are provided, the person authorised to enter electrical stations must ensure that these exits can easily be opened and that there are no obstructions.

Upon entering and leaving a zone substation, System Control must be notified by the person authorised to enter electrical stations and must ensure that all vehicle and entrance gates and doors are closed after.

Prior to any mobile plant entering an electrical station, System Control must be notified in accordance with the **Work Request procedure**.

All workers upon entering and while inside an electrical station or any other building or enclosure containing HV electrical apparatus must wear protective clothing appropriate to the work being conducted, as detailed in Clause **Error! Reference source not found.** Personal Protective Clothing and Equipment (PPCE).

All workers must ensure that all doors and gates are secured upon exit.

11.3 Safe Approach Distances – Authorised Entry to Electrical Stations

A person authorised to Enter Electrical Stations is a person who has been assessed as competent against the Evoenergy Electrical Station Entry training to enter electrical enclosures unsupervised.

An authorisation for Electrical Station Entry does not overrule any other authorisation requirements relating to work. Persons who hold an authorisation for electrical station entry may not hold any other authorisation type. When this is the case, the safe approach distances of an Ordinary Person must be maintained.

Note: Safe Approach Distances in this instance do not apply to equipment that is enclosed and at earth potential e.g., RMU switch gear at an indoor substation.

11.4 General Working Practices

The following work practices must be followed when working in electrical stations:

System Control must be notified where Mobile Plant will be operating inside electrical stations in accordance with the Work Request procedure.

- Doors, panels or covers enclosing energised equipment must be kept closed except when work is being performed inside that enclosure and the correct item of electrical apparatus is located and identified.

- Materials must not be allowed to block points of egress, doorways, obstruct passageways, hinder normal operations, work, or access to fire extinguishers, deluge showers, first aid kits, and telephones, and control switches or any operating equipment.
- Long objects such as ladders, conduits, earthing rods, portable earthing devices, etc., must be handled with care in the vicinity of energised exposed conductors. Where reasonably practicable, long objects must be carried by two people, holding the objects below shoulder height in a horizontal position and as close as practical to the ends of the object, so as to maintain maximum control.
- When mobile plant is operated within the confines of an electrical station, the possibility of inadvertent contact with energised conductors must be considered in accordance with Clause 2.5.3 Use of Mobile Plant.
- When mobile plant is being used within the confines of an electrical station, the mobile plant must be fitted with a trailing earth cable attached to a suitable connection point and connected to the earth grid of the electrical station that is capable of carrying the maximum prospective earth fault current in that station.
- Excavation within an electrical station must not be commenced until the location of all underground cables, earthing conductors, ducts, conduits, pits, or other underground infrastructure in the vicinity of the proposed excavation have been positively identified and marked.
- The integrity of any earthing conductors or other earthing system must be maintained during any excavation by bonding or other acceptable means.
- In the event that a circuit breaker is inadvertently tripped, the network operator should be immediately notified. No attempt must be made to operate the tripped circuit breaker without approval from the System Control.
- Climbing on structures to gain access to equipment which is under access authority conditions is not permitted. Appropriate ladders, elevating work platforms, scaffolding and or other approved work platforms must be used, and
- Where work is to be carried out on or near HV electrical station busbars, a minimum of one set of earthing and short-circuiting equipment must be applied directly to the de-energised busbar or bus section that is being worked on. When the busbar or bus section is divided into sections, each section must be short-circuited and earthed before being divided.
- See also Clause 4.5 Danger of Materials Which Can Conduct Electricity.

System Control must be notified prior to entering the electrical station about any work that will affect access, operability, or security of the electrical station as per the Work Request Procedure.

Figure 9. EXAMPLE OF OPERATIONAL EARTHS IN ZONE SUBSTATION

11.5 Hazards Within Electrical Stations

Persons entering electrical stations must make themselves aware of any special hazards that exist and place into effect reasonable control measures to manage those hazards. Protective devices or interlock systems must not be interfered with, bypassed, or made inoperative except in accordance with the Protection and Control Field Manual.

11.5.1 Electrical Induction

Suitable precautions must be taken by persons to avoid the dangers of induction when carrying out work on isolated electrical apparatus that is located near energised conductors. Additional working earths, short circuits and bonds must be applied where necessary to ensure equipotential conditions are maintained under all conditions.

11.5.2 Earth Potential Rise

Equipment that may be subjected to earth potential rise must be insulated, isolated, bonded, or other approved measures taken to reduce the risk to a satisfactory level.

11.5.3 Chemical Hazards

Where chemical hazards exist, signs (either temporary or permanent) must be erected warning of the dangers present. Instructions for persons responding to the hazards must be prominently displayed.

Extreme care must be exercised to reduce the possibility of injury occurring following the decomposition of products which may occur as a result of faults and explosions or from the residues of chemicals, such as polychlorinated biphenyls (PCBs) and Sulphur Hexafluoride (SF6).

11.5.4 Confined Spaces

At Evoenergy, some spaces have been assessed as confined spaces, regardless of any work that is required to be undertaken within them. Such places can be found on the **Evoenergy Confined Space Register**. The **Confined Space/Contaminated Atmosphere SWMS** must be followed when an area within an electrical station has been identified as a confined space.

11.5.5 Stored Energy

Equipment prepared for work which is capable of storing some form of energy, such as circuit breaker operating mechanisms, must be fully discharged or otherwise disabled in a manner approved prior to work commencing unless otherwise specifically requested by the workers.

Gas cylinders must be transported and secured upright to prevent rocking.

Where capacitors or capacitive charge may exist, work must not commence until the equipment has been isolated, earthed, and short-circuited and the equipment should be regarded as energised until discharged.

11.5.6 Battery Rooms

A person working in the battery room of a zone substation, or on batteries in a distribution substation must be appropriately trained and authorised, wear approved protective clothing, including safety glasses and always work in accordance with Energised Low Voltage Works Manual.

Because of the hazards associated with batteries and the potential risk of explosion, smoking or the use of an exposed flame in a battery room, or any enclosure where vented batteries are installed, is strictly prohibited. Persons working in battery rooms must ensure that the rooms are adequately ventilated by means of natural or forced ventilation if provided.

Battery leads must not be connected/disconnected as this may generate sparks. Leads must be disconnected only when no current is flowing in the battery circuit. Connections should not be made if they result in current flow (i.e., operating isolating devices in the first instance). Precautions must be in place to ensure that arcing caused by the sparking caused by power tools or by short circuiting with conductive materials does not occur.

Eye wash facilities must be provided in the immediate vicinity of battery rooms where a voltage greater than 60V DC is part of an electrical station.

Work on batteries must be conducted with insulated tools.

11.5.7 Pilot, Signaling, Telephone and Optic Cables

When working on any signaling type cable, all workers must make use of the insulation provided by wooden cubicles, insulating barriers or screens, isolating transformers, or other isolating devices.

Work on protection equipment connected to overhead pilot cables may be carried out with the overhead HV mains energised provided that the protection equipment is electrically isolated from the overhead pilots by isolating transformers, interposing relays, or other suitable devices.

Before jointing work is conducted on either overhead or underground pilot cables, they should first be disconnected from all sources of supply. In all cases, work must proceed on pilot cables treating them as energised LV apparatus.

When work is required to be carried out on pilot cable end terminations (except as specified above), this may be done with other cores of the pilot cable energised at normal operating potential, provided that all precautions are taken as for energised LV work until the cores or terminals being worked on have been identified and proved de-energised. All cores or terminals that are not to be worked on must be treated as though they are energised.

All fibre optic cables must be treated as active and bare ends should not be viewed directly unless it can be confirmed that the fibre is not connected. Further precautions should be taken to avoid exposure to glass fibre

splinters entering the body. Fusion splicers use an electric arc to make splices and should not be used around flammable gases or where explosive gases could accumulate.

11.5.8 Current and Voltage Circuits

Before working on the secondary circuits of current transformers including protection and revenue metering, the worker must ensure that all necessary precautions are taken to prove that secondary conductors are at earth potential and to prevent an open circuited secondary situation.

Before working on voltage circuits and where reasonably practicable, the circuit must be isolated by removing the fuse cartridges for permanently fused voltage circuits or opening the voltage links in the test block.

> Testing to prove de-energised must be conducted before commencing work.

11.5.9 Voltage and Auxiliary Transformers

Before working on voltage transformers (other than draw out type transformers), isolation, earthing and short-circuiting of the HV windings and isolation of all secondary windings must be carried out.

If the HV conductors to which the voltage and auxiliary transformers are connected are isolated, earthed, and short circuited, the voltage transformer may remain connected to the HV conductors provided that the LV windings are isolated, and danger tagged.

For capacitive voltage transformers or similar equipment, do not apply earths immediately after isolation. Allow a minimum period of five minutes to discharge before applying any earths.

11.5.10 Fire Protection Systems

When persons are carrying out work in electrical stations with fixed fire protection systems, suitable control measures must be taken to ensure the safety of workers and equipment. Precautions may include the isolation, or the making ‘non-auto’ of fire detection and extinguishing systems.

Persons should also check for the existence of remote fire control gas injection systems (such as bulk injection carbon dioxide) to ensure that operation cannot occur during occupancy.

On exiting an electrical station, fire detection and extinguishing systems made ‘non-auto’ prior to work commencing, must be reset for normal automatic operation.

Figure 10. EXAMPLE OF VEHICLE EARTHING IN A ZONE SUBSTATION

12 Metering

12.1 Principle

For work on metering installations, workers must be appropriately trained or authorised. The basic safe work principles set out in Section 9 – Access to Low Voltage (LV) Electrical Apparatus apply.

12.2 General

A job risk assessment must be conducted to assist in the identification and control of hazards to ensure that the work can be performed safely.

The job risk assessment must consider as a minimum the:

- condition of the electrical apparatus, for example wiring, meters and terminals, and
- proximity of other electrical apparatus, for example potential second points of contact, and
- proximity of earthed equipment and structures, and
- work environment, for example heat, light, weather conditions, and
- use of personal protective apparel and insulated/covered tools, and
- use of insulated barriers and covers, and
- potential presence of asbestos.

Subject to the outcomes of the job risk assessment and procedures, revenue metering activities may be performed by workers working alone.

12.3 Metering – Changes to Existing Installations

Only authorised persons can change metering equipment. Refer to Clause 3.7.5 Network Boundary Authorisation for third party authorisations.

12.4 Metering – Work On Energised Equipment

Only authorised persons are permitted to work on energised metering equipment for testing or investigative purposes. Test equipment must only be connected/disconnected from energised metering equipment terminals when it can be done safely, and the actions of connection/disconnection do not involve the making or breaking of customer load.

Workers about to work on or within reach of energised circuits must:

- be appropriately trained and authorised for the purpose of work, and
- undertake a hazard identification and risk assessment, and
- use appropriate PPE including insulating gloves, and
- only use insulated/covered tools, and
- apply an approved insulating sheath over any exposed conductor that is removed from its terminal.

12.5 Metering – Work On Transformer Operated Equipment

Work on transformer operational equipment must only be performed by authorised persons.

12.5.1 Earthed secondary system

Current circuits

The following applies to all current transformer circuits, including protection and revenue metering.

Before working on the secondary circuits of current transformers, the Worker must ensure that all of the following necessary precautions are taken:

- complete a hazard identification and job risk assessment having regard to the surrounding conditions and the movement of other people in the area.
- prove that secondary conductors are at earth potential.
- prevent an open circuited secondary situation.

Voltage circuits

Before working on voltage circuits on a meter panel the circuit must be isolated by:

- removing the fuse cartridges for permanently fused voltage circuits, or
- opening the voltage links in the meter test block AND testing to prove de-energised before commencing work.

Voltage circuits connected on the supply side of a meter panel must be isolated and tested to prove de-energised before work commences on them.

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13 Version Control

Revision number	Details	Approved
1.0	VESI Greenbook, Ian Macara, Victoria Parkinson, Maher/Wilson, and others. Previous editions 2009 – 2013 now superseded.	Group Manager Strategy and Operations
2.0	June 2014 Complete review Work Practices created to take ownership of Blue Book and tasked with complete review	Group Manager Strategy and Operations
3.0	2015 Legal disclaimer Amendments made by Legal and Secretariat Division	Group Manager Strategy and Operations
4.0	April 2015 Review Work Practices review - review and update	Group Manager Strategy and Operations
5.0	May 2016 Review Work Practices review - review and update	Group Manager Strategy and Operations
6.0	Dec 2016 Minor amendments 2.6.1 and 4.8 IMS Version 2	Group Manager Strategy and Operations
7.0	Nov 2017 Complete Review Branding review from ActewAGL Distribution to Evoenergy	Group Manager Strategy and Operations
8.0	June 2018 Complete Review incorporating changes from the ESR register and Transfer to 201 Style. No longer ‘Blue Book.’	Group Manager Strategy and Operations
9.0	Sept 2019 Complete Review ESR issues register Feedback review updates new definitions, clearances changes in tables, additional notes for clarification, SCAP further defined and aligned with other access authority requirements, training table updated, minor administrative updates	Group Manager Strategy and Operations
10.0	May 2021 Complete Review ESR issues register Feedback review updates, new definitions, additional notes for clarification, SCAP further defined and aligned with other access authority requirements, training table updated, minor administrative update, Rearrangement of sections, Section 13 removed, and detail disbursed through section 7, PPE terminology changed to PPCE, Adjustment to basic authorisation terminology	Group Manager Strategy and Operations
11.0	Feb 2025 Complete Review incorporating changes from the ESR feedback form including additional information in Section 3 for the clarification of internal and third-party authorisation types. Supervised Worker modified to enable ordinary person to perform supervised work under an Access Permit. Section 4 reordered into alphabetical order. Safety Observer split into Energised Work and Mobile Plant in line with VESI Greenbook. Consolidation of underground cables and excavation rules to Section 5. Removal of references to a Permit to Work (energised) throughout document. Removal of Table 7.1. Addition of Yellow Tape - In method into Section 7.	Group Manager Strategy and Operations

14 Document control

Document owner	Document custodian	Published date	Review date
Group Manager Strategy and Operations	Manager Works Practices and Operational Learning	20/03/2025	20/3/2030

Appendix A Evoenergy Policies and Procedures List

The following is a list of Evoenergy documents referred to in these safety rules. This list is not exhaustive and is subject to withdrawal, revision, or addition at any time.

- Accreditation and Authorisation Procedure.
- Apprentice Training Management Procedure.
- Civil Works Manual.
- Confined Space Procedure.
- Connection And Modification of Network Elements.
- Earthing Construction Manual.
- Energised Low Voltage Works Manual.
- Evoenergy Approved Power and Hand Tools Linesperson / Switcher / Electrical Fitter.
- Evoenergy Risk Assessment Tables.
- Evoenergy Service and Installation Rules.
- Evoenergy SWMS – Suite.
- High Voltage Cable and Apparatus Testing Manual.
- Instructions for Safe to Climb Test.
- Job Risk Assessment Procedure.
- Learning Services Competency and Training Procedure.
- Lock Out / Tag Out Procedure.
- Live High Voltage Line Manual.
- Live HV Network Access.
- Low Voltage Cable and Apparatus Testing Manual.
- Network Switching.
- Personal Protective Clothing and Equipment Manual.
- Preparation And Checking of Switching Plans.
- Primary And Secondary Assets Commissioning Work Instruction.
- Protection and Control Field Manual.
- Servicing Manual.
- Recording Of Live Work On or Near the LV Distribution Network.
- Requirements For Work and Other Activities Within Sub Transmission Reservations.
- Statement of Condition of Apparatus or Plant (SCAP Procedure).
- Temporary Traffic Management Work Instruction.
- Tools Equipment Testing and Inspection.
- Zone Substations Primary Systems Field Manual.
- Work Request Procedure.

Appendix B External Reference Documents

The list of documents in this appendix is not exhaustive and is for guidance only. Other relevant documents and standards may be applicable. Acts and Regulations current to the time of review.

Legislation

- Electrical Safety Act 1971.
- Electrical Safety Regulation 2004.
- Utilities Technical Regulation Act 2014.
- Utilities (Management of Electricity Network Assets Code) Determination 2013.
- Utility Networks (Public Safety) Regulation 2001.
- Utilities (Technical Regulation) (Electricity Powerline Vegetation Management Code) Approval 2018
- Work Health and Safety Act 2011.
- Work Health and Safety Regulation 2011.

Industry guidelines

- Access Canberra Framework: Building, Planning and Construction Regulatory Services.
- Energy Networks Association Guidelines:

ENA DOC 001-2019	National Electricity Network Safety Code
ENA NENS 03-2006	National Guidelines for Safe Access to Electrical and Mechanical Apparatus
ENA NENS 04-2006	National Guidelines for Safe Approach Distances to Electrical and Mechanical Apparatus
ENA Doc 007-2006	Specification for Pole Mounting Distribution Transformers
ENA Doc 008-2006	National Guidelines on Electrical Safety for Emergency Service Personnel
ENA NENS 09-2014	National Guideline for The Selection, Use and Maintenance of Personal Protective Equipment for Electric Arc Hazards
ENA Doc 012-2006	Cross-Arm Supply and Performance Specification
ENA EMF 2016	ENA EMF Management Handbook
ENA Doc 017-2008	ENA Industry Guideline for The Inspection, Assessment and Maintenance of Overhead Power Lines
ENA Doc 023-2009	ENA Guidelines for Safe Vegetation Management Works Near Overhead Lines
ENA Doc 031-2011	ENA National Guideline for Mobile Plant Earthing
ENA Doc 042-2018	National Guidelines for Manual Reclosing of High Voltage Electrical Apparatus Following a Fault Operation (Manual Reclose Guidelines)
ENA Doc 044-2020	Guideline for Energised Low Voltage Work
ENA DOC 052-2024	National Guidelines for Remotely Piloted Aircraft Systems Operations on Electricity Networks

Australian standards

AS 2865-2009	Confined spaces
AS/NZS 3000:2018	Electrical installations (wiring rules)
AS/NZS 4501.1	Occupational protective clothing
AS 5804.1:2010	High voltage energised working – General
AS 5804.4-2010	High-voltage energised working – Barehand work
AS 5804.2:2010	High-voltage energised working – Glove and barrier work
AS 5804.3-2010	High-voltage energised working – Stick work
AS/NZS 1891.1:2020	Personal equipment for work at height
AS/NZS 3760:2022	In-service safety inspection and testing of electrical equipment and RCDs
AS/NZS 4801:2001	Occupational health and safety management systems – specification with guidance for use
AS/NZS 4836:2023	Safe working on or near low-voltage and extra-low voltage electrical installations and equipment
AS 1319:1994	Safety signs for the occupational environment (Reconfirmed 2018)
HB 87-1997 (CJC 1)	Joint use of poles, The placement on poles of power lines and paired cable telecommunications lines