



**ELECTRICAL SAFETY  
RULES FOR THE VESI  
DISTRIBUTION NETWORKS**

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# THE GREEN BOOK 2023

2023-10

INTRODUCTION

PART 1 - SAFETY, TRAINING &  
AUTHORISATIONS

PART 2 - WORK IN VICINITY OF  
ELECTRICAL APPARATUS & SAD

PART 3 - ACCESS FOR WORK ON  
OR NEAR HV ELECTRICAL APPARATUS

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# ISSUE SHEET



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## PREFACE

The Code of Practice on electrical safety for work on or near high voltage electrical apparatus (the Blue Book), covers the basic safety principles to be observed by all personnel working on or in the vicinity of HV electrical apparatus in Victoria.

The Green Book is the Electrical Safety Rules (the Rules) for the VESI Distribution Networks and incorporates the relevant Distribution related principles of the Blue Book.

Electricity Safety Management Schemes (ESMS's), submitted by Distribution Businesses as Major Electricity Companies (MEC's), are required under the Electricity Safety (Management) Regulations 2019, and state that MEC's shall provide "published technical standards" or, where there are departures, show that the level of safety is at least equal to, or greater than, those standards.

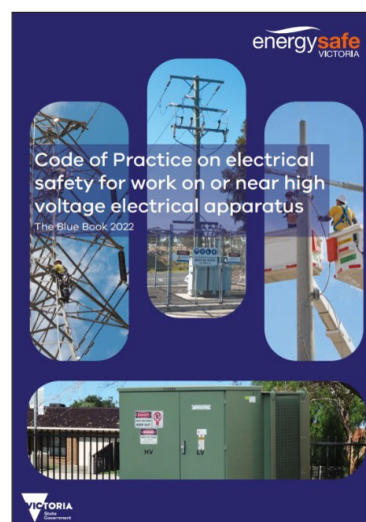
The Green Book, by incorporating the relevant Distribution components of the Blue Book, provides the means by which the MEC's comply with the published technical standards.

Each Distribution Network is responsible for elaborating on and supplementing these Green Book Rules to meet their own individual requirements.

The importance of understanding and adherence at all levels to these mandatory requirements continues to be emphasised by the circumstances of electrical incidents.

These Rules are regularly reviewed by the Green Book Committee to ensure that they reflect current work requirements and evolving technologies.

Suggestions or comments regarding possible amendments should be addressed to the Committee via [www.vesi.com.au](http://www.vesi.com.au).



## PURPOSE

The purpose of these Rules is to:

- Provide practical guidance in maintaining safe systems of work in relation to the control of risks associated with work on, near or in the vicinity of VESI Distribution Networks.
- Provide the means by which the MECs comply with the Blue Book as a published technical standard.

## SCOPE

These Rules define:

- Principles; and
- Electrical Safety Requirements

These Rules apply to all employees, contractors and sub-contractors of the Distribution Networks, working on, near or in the vicinity of electrical apparatus controlled by the Distribution Networks.

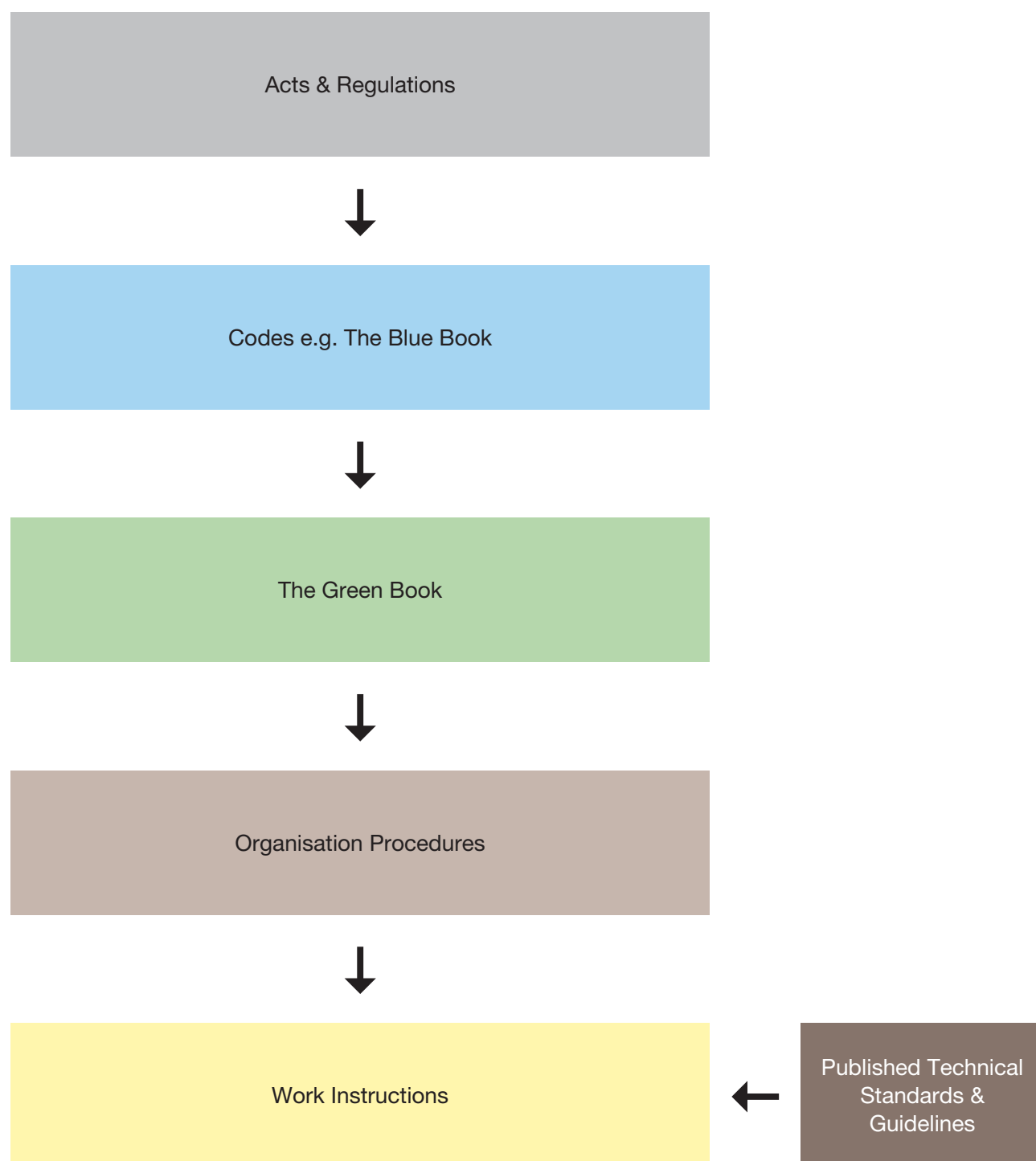
These Rules are also applicable to electrical apparatus that is not electrically connected and where the required level of isolation cannot be confirmed prior to work commencing, for example on abandoned underground cables.

These Rules set a minimum standard and may be enhanced by organisational procedures which may utilise other industry standards.

In order to change the minimum standard of these Rules, a Distribution Network shall:

- 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.
- Ensure any variations that diminish the minimum standard are endorsed by a responsible officer, that the Green Book Committee is informed and that Energy Safe Victoria is advised of the outcomes and reasons for variation(s) prior to implementing the variation(s).

# HIERARCHY OF DOCUMENTATION FOR ELECTRICAL SAFETY



## DEFINITIONS

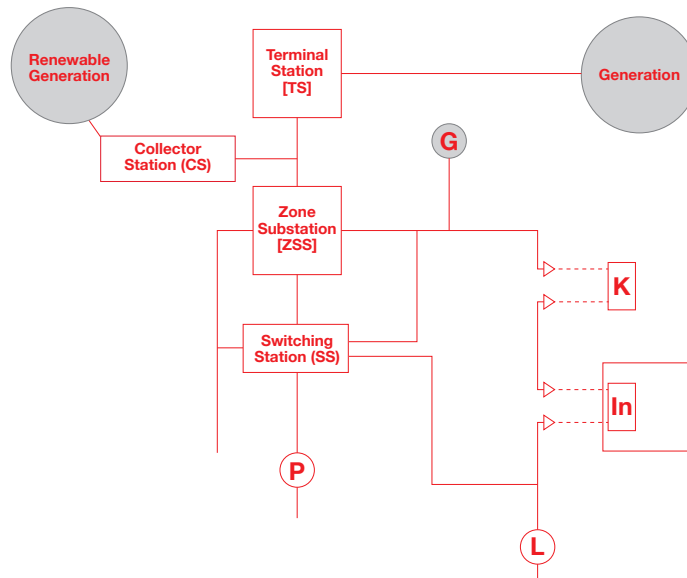
1. **Access Authority** means any form of authorisation which allows access to, work on or near, or testing of electrical apparatus. Examples used in these Rules are:
  - **Electrical Access Permit** means a form of authorisation which allows access to, and work upon, electrical apparatus.
  - **Sanction for Testing** means a form of authorisation to allow energisation of electrical apparatus for testing purposes.
  - **Permit to Work** Adjacent to Network Assets means a document providing written permission to persons, other than employees or contractors of the Distribution Network, to work near or in the vicinity of the Distribution Network's electrical apparatus.
2. **Adjacent** means an area that is within Safe Approach Distances or near or in the vicinity of the Distribution Network's electrical apparatus.
3. **Alive** see Live.
4. **Appliance** means any instrument or device designed for the use near or in direct contact with HV live conductors.
5. **Approved** means having appropriate organisation endorsement in writing for a specific function.
6. **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 the organisation, to perform the duty concerned. Authorities in these Rules are:
  - **Authorised Applicant** means an approved person who has been assessed as competent against an approved training standard to make application for specified types of Access Authorities.
  - **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 HV electrical apparatus.
  - **Authorised to Enter** means an approved person who has been assessed as competent against an approved training standard to enter enclosures.
  - **Authorised Recipient** means an approved person who has been assessed as competent against an approved training standard to receive an Electrical Access Permit.
  - **Authorised Tester** means an Authorised Recipient who has been assessed as competent against an approved training standard, and is approved to receive Sanction for Testing.
  - **Authority to Receive Electrical Access Permits** means a form of authorisation held by an Authorised Recipient.
  - **Authority to Receive Sanctions for Testing** means a form of authorisation held by an Authorised Tester.
  - **Authority to Work in the Vicinity of Electrical Apparatus** is a form used for VESI employees where applicable to allow work in the vicinity of electrical apparatus.
7. **Beyond Reach** means the distance beyond the reach of any part of the person's body or any conducting or unapproved object touching any part of the person's body.
8. **Bonded** means connected together in such a manner as to ensure that all connected parts are maintained at the same potential.
9. **Cable** means an insulated conductor or two or more such conductors laid together, whether with or without fillings, reinforcements, or protective coverings.
10. **Circuit Breaker** means a device capable of making, carrying, and breaking currents under normal and abnormal circuit conditions, such as short circuit.
11. **CMEN** means Common Multiple Earth Neutral, a variation of the MEN system whereby the HV earths are bonded to the LV neutral earth system. The system uses the LV system earth resistance obtained by the interconnection of multiple LV substations and faster clearing time to limit the step and touch voltages in the vicinity of earthed structures following the occurrence of a fault.

12. **Competent** means having the skills, knowledge and attributes a person needs to complete a task.
13. **Conductor** means a wire, cable or form of metal designed for carrying electrical current.
14. **Connected** means joined together by a conductor capable of carrying electrical current for its required function or purpose by either physically clamping or bolting conductors together or closing a circuit breaker, switch or similar device.
15. **Dead** means isolated and at earth potential.
16. **De-energised** means not connected to any source of electrical supply but not necessarily isolated.
17. **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.
18. **Distribution Network (Distribution Business)** means the owner, controller or operator of a VESI electricity Distribution Network.
19. **Earthed** means directly electrically connected to the general mass of earth so as to ensure and maintain the effective dissipation of electrical energy.
20. **Earthing Device** means an approved device used for the earthing of conductors.
21. **Effective supervision**, in relation to work, means:
  - being present at the site of the work to the extent necessary to ensure that the work is being correctly performed and carried out in accordance with (as each worksite requires) these Safety Rules, the Regulations, approved procedures; and
  - being aware of the details of the work being performed and giving detailed instructions and directions with respect to the work.
22. **Electrical Apparatus** means any HV or LV electrical equipment, including overhead lines and underground cables, the conductors of which are live or can be made live.
23. **Emergency** means a sudden urgent unplanned occurrence or occasion requiring immediate action where life or property is at risk.
24. **Enclosure** means any secured area containing exposed electrical apparatus.
25. **Energised** means connected to a source of electrical supply.
26. **ESI** means Electricity Supply Industry.
27. **Exclusion Zone** means an area around the electrical apparatus into which no part of the person, mobile plant or object (other than approved insulated objects) may encroach.
28. **Exposed Conductor** means an electrical conductor which is live or can be made live, approach to which is not prevented by a barrier of rigid material or by insulation that is adequate under a relevant Australian Standard specification for the voltage concerned.
29. **High Voltage or 'HV'** means a nominal voltage exceeding 1000 volts a.c. or exceeding 1500 volts d.c.
30. **High Voltage Customer** means any user of electricity (excluding the VESI) directly connected at high voltage to the Transmission or Distribution Networks.
31. **Instructed Person** means a person effectively supervised by an Authorised Person to enable them to avoid the dangers that electricity may create.
32. **Insulated Mobile Plant** means mobile plant approved and tested for carrying out work on or near electrical apparatus.
33. **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.
34. **Insulating Stick** means a stick approved and tested for carrying out operating and live work on live electrical apparatus.
35. **Isolated** means not connected to any 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 purposes.

36. **Isolator** means a device which, for reasons of safety, provides in the open position, breaks of a length appropriate to the voltage and the insulating medium.
37. **Job Safety Analysis** or **JSA** means a site specific assessment by the work party of hazards associated with performing a task which includes documenting the controls for the identified hazards.
38. **Live** means energised or subject to hazardous induced or capacitive voltages.
39. **Live Work** means all work performed on components of electrical apparatus not isolated, proved de-energised and earthed.
40. **Low Voltage** or **LV** means nominal voltage exceeding 50 volts a.c./120 volts d.c. but not exceeding 1000 volts a.c./1500 volts d.c.
41. **Low Voltage Isolation and Bonding Statement** or **LVIBS** means a form of authorisation which allows access to, and work upon, low voltage electrical apparatus.
42. **Major Electricity Company (MEC)** means:
  - a. a distribution company, or
  - b. a transmission company,
 but does not include a distribution company or a transmission company, or a class of distribution company or transmission company, declared under section 3A of the Electricity Safety Act 1998 not to be a major electricity company.
43. **MEN** means Multiple Earth Neutral, an earthing system where the LV neutral conductor is permanently connected to earth at the distribution substation, the customer premises and any other point throughout the neutral system as required.
44. **Metal Clad Switchgear** means an integrated switching assembly where all live parts are enclosed within an earthed metal compartment.
45. **Milliteslas (mT)** means a unit of magnetic flux density 1,000 times smaller than the SI Unit; the Tesla.
46. **Mobile Plant** means cranes, elevating work platforms, tip trucks or similar plant, any equipment fitted with a jib or boom and any device capable of raising or lowering a load. Mobile plant can only be considered as a vehicle when in the normal travelling mode and not in the working mode when determining Safe Approach Distances. **Aerial Vehicles including drones** are excluded from this definition of mobile plant.
47. **Near** means a situation where there is a reasonable possibility of a person either directly or through any conducting medium (e.g., via mobile plant) coming within the relevant Safe Approach Distances.
48. **Network Asset** means any asset that is owned or operated by a Distribution Network for the purposes of generating, transmitting, distributing, or supplying electricity.
49. **Network Controller – (also Network Coordinator)** means a person who is suitably trained to direct or be responsible for directing switching of a MEC electricity Network, including co-ordination and direction of all switching and permit issue/cancel on and associated with the MEC Electricity Network, whilst also considering the integrity of the network.
50. **No Go Zone Rules** means the documented guidelines prescribed and published by WorkSafe Victoria, which are available for non-electrical workers to perform activities near protected infrastructure.  
No Go Zone Rules for MEC distribution infrastructure do not apply to VESI Distribution Network employees/contractors who work to Safe Approach Distance.
51. **Nominal Voltage** means the AC (phase to phase RMS) or DC voltage by which a system of supply is designated.
52. **Not Electrically Connected** means 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 made live by normal operating means and identified in accordance with approved procedures.
53. **Operating Authority** means an appropriate representative of an organisation, who is responsible for the control of electrical apparatus concerned.
54. **Operating Stick** see *insulating stick*.



55. **Ordinary Person** means a person working for a Distribution Network without sufficient training or experience to enable them to avoid the dangers which electrical apparatus may create.
56. **Organisation** means a business, enterprise, company, or corporation.
57. **Out of Commission** means the condition of electrical apparatus which is not electrically connected and declared to be so in writing to the Operating Authority responsible for the electrical apparatus.
58. **Personal Protective Equipment (PPE)** means 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.
59. **Practicable see Reasonably Practicable.**
60. **Procedure** means the documentation of a systematic series of actions (or activities) directed to achieve a desired result.
61. **Recipient** means a person who has signed on an Access Authority.
62. **Recipient in Charge** means an Authorised Recipient to whom an Access Authority has been issued and who is in charge of all Recipients signed on that Access Authority.
63. **Reasonably Practicable** means having regard to:
  - a. the likelihood of the hazard or risk concerned eventuating; and
  - b. the degree of harm that would result if the hazard or risk eventuated; and
  - c. what the person concerned knows, or ought to reasonably know, about the hazard or risk and any ways of eliminating or reducing the hazard or risk; and
  - d. the availability and suitability of ways to eliminate or reduce the hazard or risk; and
  - e. the cost of eliminating or reducing the hazard or risk.
64. **Risk Assessment** means an organisation's documented formal analysis of hazards associated with work on, near or in the vicinity of electrical apparatus are identified, assessed and controlled.
65. **Rules** means these Electrical Safety Rules also known as the Green Book.
66. **Safe Approach Distance (SAD)** means the minimum distance in air that shall be maintained by a person, 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 EAP or HV live work.
67. **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.
68. **Shall** is to be interpreted as "mandatory".
69. **Should** is to be interpreted as "advisory or discretionary".
70. **Station** means any enclosed or fenced location in which HV supply is generated, converted, controlled, or transformed.
71. **Substation** means a distribution transformer arrangement (other than a Zone Substation) where the secondary voltage is low voltage.



**TS, CS, ZSS, SS** - station types  
(all are enclosures)

**P** pole type substation  
(is **not** an enclosure)

**G** ground type substation  
(is an enclosure)

**K** kiosk type substation  
(is an enclosure)

**In** indoor type substation  
(is an enclosure)

**L** line voltage regulator  
(pole mounted is **not** an enclosure)  
(ground mounted is an enclosure)

72. **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.
73. **Tester in Charge** means an Authorised Tester to whom a Sanction for Testing has been issued and who is in charge of all members of the work party signed on that Sanction for Testing.
74. **Unplanned** means an unexpected occurrence or occasion (fault) where life or property is not at immediate risk
75. **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).
76. **Vicinity** means a situation 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.
77. **Victorian Electricity Supply Industry (VESI)** means the industry body whose members are the organisations which are licensed under the Electricity Industry Act 2000 to participate in the transmission, distribution, and supply of electricity in Victoria.
78. **Written (in Writing)** means recorded on paper or in electronic form.



## ABBREVIATIONS

<b>ARPANSA</b>	Australian Radiation Protection and Nuclear Safety Agency
<b>CES</b>	Certificate of Electrical Safety
<b>CMEN</b>	Common Multiple Earthed Neutral
<b>EAP</b>	Electrical Access Permit
<b>ENA</b>	Energy Networks Association
<b>ESI</b>	Electricity Supply Industry
<b>EWP</b>	Elevating Work Platform
<b>HV</b>	High Voltage
<b>JSA</b>	Job Safety Analysis
<b>kV/m</b>	kilovolt per metre (kV/m) = 1000 volts per metre
<b>LVIBS</b>	Low Voltage Isolation and Bonding Statement
<b>LV</b>	Low Voltage
<b>MEN</b>	Multiple Earthed Neutral
<b>NENS</b>	National Electricity Network Safety
<b>NHMRC</b>	National Health and Medical Research Council
<b>PPE</b>	Personal Protective Equipment
<b>RIC</b>	Recipient in Charge
<b>SAD</b>	Safe Approach Distance
<b>SCAP</b>	Statement of Condition of Apparatus
<b>SFT</b>	Sanction for Testing
<b>SILV</b>	Statement of Isolation LV
<b>SWER</b>	Single Wire Earth Return
<b>VESI</b>	Victorian Electricity Supply Industry
<b>VSCAP</b>	Verbal Statement of Condition of Apparatus

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# SAFETY, TRAINING & AUTHORISATIONS

## PART 1

INTRODUCTION

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### PRINCIPLE

- *Persons shall be assessed as competent and where required authorised for the role they are undertaking.*

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## 1.1 General Safety

### 1.1.1 Hazard Identification, Risk Assessment and Control

#### 1.1.1.1 Organisational Risk Assessment

An organisation's safe system of work shall include appropriate risk management processes to ensure hazards associated with work near electrical apparatus are identified, assessed and controlled.

#### 1.1.1.2 Field Based Risk Assessment

Prior to working on or adjacent to any electrical apparatus, the persons performing the work shall identify, assess and control the associated hazards and risks using Job Safety Analysis (JSA) methodology.

The JSA shall be regularly reviewed to ensure workplace compliance.

### 1.1.2 First Aid

Persons who are required to perform work as an Approved/Authorised Person shall be given appropriate first aid training prior to undertaking associated task, and thereafter subject to annual competency assessment in accordance with relevant National Competency Standard Units.

### 1.1.3 Victim Rescue

Persons shall be trained in victim rescue techniques appropriate to the job function being performed.

Before performing victim rescue on or near live exposed conductors, the rescuer shall consider all hazards and methods to control the hazards to ensure the rescue can be performed safely. Such controls may include de-energisation of the circuit, the use of insulated sticks and maintaining SAD during the rescue.

Victim rescue assessment and/or instruction shall be undertaken by relevant personnel in accordance with Electricity Supply Industry (ESI) National Competency Standard Units.

For details on victim rescue training requirements, refer to the *VESI Skills and Training Guideline* at [www.vesi.com.au](http://www.vesi.com.au).

### 1.1.4 Communications

All communications relating to the operation of, or access to, electrical apparatus shall be clear and definite. Electrical apparatus shall be referred to by name and sufficient detail to give positive identification. Verbal instructions and statements shall be confirmed by repeating back to avoid misunderstanding, refer to Clause 3.1.3.

### 1.1.5 Forms

Guidance for minimum requirements on forms is published at [www.vesi.com.au](http://www.vesi.com.au).

### 1.1.6 Use and Testing of Operating and High Voltage Live Equipment

All sticks, gloves, sleeves, mats, protective barriers or covers, earthing trucks, portable earthing devices, insulating platforms, insulated elevating work platforms (EWP) or other equipment used for operating HV electrical apparatus or performing HV live work shall meet a defined specification or be approved for the particular application.

Visual inspection shall be made for physical damage or contamination immediately prior to use.

All equipment, including protective equipment used on HV electrical apparatus and which requires regular testing to prove the effectiveness of its insulation shall be tested in accordance with the organisational procedures.

HV live work equipment test intervals shall align with the VESI Minimum Rules for Carrying Out High Voltage Live Work in Victoria.

Operating equipment shall be tested at specific intervals as per approved procedures. More frequent testing may be required depending on usage and the work environment. Equipment shall be marked to show the date of the next routine test.

Equipment shall not be used after the marked test date until it has been re-tested and passed. For EWPs test intervals refer Clause 2.1.4.1.

Gloves, sleeves, mats and protective barriers or covers used for operating HV electrical apparatus or for performing HV live work shall not be relied upon as the sole means of protection.

### 1.1.7 Insulating Sticks

Insulating sticks shall have a length which provides appropriate insulation from live parts and enables a person using the stick to maintain the applicable SAD, refer Section 2.3.

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

Only Authorised Persons or persons trained in the use of insulating sticks shall use insulating sticks on live electrical apparatus.

### 1.1.8 Labelling of Electrical Apparatus

For the purposes of identification and description, electrical apparatus shall, wherever practicable, be clearly labelled.

### 1.1.9 Ladders

Conductive ladders (including wire reinforced) shall not be used on, near or in the vicinity of, exposed live electrical apparatus.

### 1.1.10 Personal Protective Equipment (PPE)

#### 1.1.10.1 General

All persons performing work who may be exposed to possible electric shock, arc flash or other injury from electrical apparatus shall use approved PPE.

All protective equipment and apparel shall comply with relevant Australian Standards and guidelines.

Additional PPE shall be used in accordance with the type of work and the risks involved.

### 1.1.10.2 Persons Performing Work On or Near Electrical Apparatus

Persons performing work on, near or in the vicinity of electrical apparatus shall utilise the following approved PPE:

- Safety headwear
- Safety footwear
- Ankle to wrist natural fibre or arc flash protective clothing
- Insulated gloves for live work
- Face/eye protection for live work

### 1.1.10.3 Persons Visiting Station Environments

Persons visiting station environments that have no direct involvement in any work at that site and where required their movements are confined to normal access ways, e.g., roads, paths, and stairs shall utilise the following approved PPE:

- Safety headwear
- Fully enclosed footwear
- Ankle to wrist cover

## 1.1.11 Tapes and other Measuring Devices

Only non-conducting tapes, rulers and other measuring devices shall be used near live electrical apparatus.

Conductive tapes, rulers and other measuring devices shall not be used near exposed live electrical apparatus unless for use in accordance with organisational procedures.

## 1.1.12 Use of Safety Observers

### 1.1.12.1 Live Work General

Unless working in accordance with Section 4.2.1 or undertaking a HV operating task, a Safety Observer shall be appointed where it is prescribed by organisational procedures, or it is considered after a JSA that a person might inadvertently infringe the SAD.

Under no circumstances shall the Safety Observer be diverted to another task while the possibility of infringing the SAD 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 shall be maintained between the Safety Observer and the worker/s being observed.

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

- Be trained and competent in the task being observed and the relevant rescue techniques.
- 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.
- Monitor the work and warn against potential infringement of SAD.

For live HV work refer to the *VESI Minimum Rules for Carrying out HV Live Work in Victoria*.

#### 1.1.12.2 Mobile Plant

A Safety Observer shall be appointed where it is prescribed by organisational procedures, or it is considered after a JSA that mobile plant might inadvertently infringe the SAD.

Under no circumstances shall the Safety Observer be diverted to another task while the possibility of infringing the SAD 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 shall be maintained between the Safety Observer and the plant operator.

Before any person can act as a Safety Observer of mobile plant in proximity of electrical apparatus, they shall:

- Be an ESI Worker trained 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 SAD.

For live HV work refer to the *VESI Minimum Rules for Carrying out HV Live Work in Victoria*

#### 1.1.13 Fit State for Work

Personnel shall be in a fit and safe condition to commence work. Alcohol, drugs, prescription medication, fatigue, mental alertness and physical condition of a person may impede their ability to work safely in an electrical environment.

Persons who are required to work on, near or in the vicinity of electrical apparatus shall not consume or be under the influence of alcohol or drugs that diminish work skills during work hours. This shall be taken to include meal or rest breaks.

Appropriate policies shall be implemented by organisations.

#### 1.1.14 Portable Electric Tools and Equipment

Portable electric tools and equipment, and extension leads should be approved, used, repaired and tested as detailed in organisational procedures.

Electric power tools with trailing leads, shall be treated as being at earth potential. Precautions shall be taken to ensure that the trailing lead is secured and does not contact exposed live conductors.

#### 1.1.15 Design, Construction and Commissioning

Organisational procedures for design, construction and commissioning of electrical assets shall ensure that the safe access procedures in these Rules can be achieved.



## 1.2 Work within Electric and Magnetic Fields

### 1.2.1 General

Electric and Magnetic Fields (EMFs) may be present in workplaces.

Where EMFs are of high intensity, actions need to be undertaken in order to protect persons from any adverse effects including:

- the irritating micro-shocks, due to electric discharge effects of strong electric fields; and
- the possible biological effects associated with extremely strong electric and magnetic fields.

Persons fitted with implant or body-worn medical devices, including cardiac pacemakers, metallic implants, insulin pumps or of their pregnancy, should consult their doctors and the relevant organisational officer for information on possible electromagnetic interference with the medical devices prior to entering areas of strong electric and magnetic fields.

Advisory occupational exposure limits provided in ICNIRP Guidelines and IEEE C95.1 Standard are listed in the following sections 1.2.2 and 1.2.3.

Organisations should establish appropriate exposure limits in accordance with industry guidelines e.g., Energy Network Australia (ENA) EMF Management Handbook.

### 1.2.2 50Hz Electric Fields

Advisory occupational exposure limits for electric fields based on abovementioned guidelines are as follows:

Unrestricted	Less than 10kV/m
Maximum Permissible Exposure	20kV/m
Alternative Controls	Greater than 20kV/m

For work situations with field strengths greater than 20kV/m, alternative controls shall be used. Such controls include:

- restricted access,
- wearing appropriately earthed or bonded conducting suits,
- the screening and earthing of vehicles,
- the screening of work platforms and access ways, and
- de-energising adjacent electrical apparatus.

The person responsible for planning the work shall include in the work instructions details of any appropriate measures to be taken.

### 1.2.3 Magnetic Fields

Advisory occupational exposure to magnetic fields are as follows:

50 Hz Magnetic Fields	
General Exposure	1 milliTesla (10,000 milliGauss)
Exposure to head and torso	2.71 milliTesla (27,100 milliGauss)
Exposure to arms and legs	75.8 milliTesla (758,000 milliGauss)

### Static or Direct Current (DC) Magnetic Fields

The 2009 International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines for limits A, B & C (see notes below) of occupational exposure to static or DC magnetic fields are as follows:

Head and Trunk	2000 milliTesla
Limbs	8000 milliTesla

#### CAUTION

- A.** Because of potential indirect adverse effects, ICNIRP recognises that practical policies need to be implemented to prevent inadvertent harmful exposure of persons with implanted electronic medical devices and implants containing ferromagnetic material. This requirement may lead to much lower restriction levels such as 0.5 milliTesla.
- B.** For specific work applications, exposure up to 8000 milliTesla can be justified if the environment is controlled and appropriate work practices are implemented to control movement-induced effects.
- C.** When magnetic flux densities exceed 5 milliTesla (static or DC magnetic fields) precautions should be taken to prevent hazards from flying metallic objects.

## 1.3 Training

### 1.3.1 General

An organisation's safe system of work shall include reference to appropriate training, competency and authorisations for all persons working on or near electrical apparatus.

A person's competency and/or authorisation shall be current for the task being performed.

Persons holding authorisations shall be competency assessed at a nominal three-yearly interval and where appropriate training given to restore competency.

Training will consist of identified learning outcomes which will be knowledge, skill (task), and attitude based and where appropriate, reflect National Competency Standards.

Where a national or state competency standard does not exist, an organisation may develop a training and assessment standard in consultation with a Registered Training Organisation

A person who is not authorised may perform a task that normally requires authorisation or approval, (e.g., HV live work, HV operating) when that task is performed under a training program, and the person is effectively supervised by a person with the relevant authorisation.

Due to the proprietary and specialist nature of each MEC's network access system compared to the standard legacy paper-based systems, an MEC may choose to waive three-yearly competency assessments for Authority to Make Application. Such waiver shall be made in accordance with the rules to vary the safety requirements as specified in the scope of the Green Book.

### 1.3.2 Learning Outcomes

Learning outcomes shall meet those described in VESI, State and National Training Standards. Refer to training standards published in the VESI Skills and Training Guideline at [www.vesi.com.au](http://www.vesi.com.au).

Where learning outcomes are established at the VESI level, the course descriptors shall include learning outcomes and assessment criteria.

### 1.3.3 Approved Training Providers

Organisations shall approve training providers as meeting the requirements published in the *VESI Skills and Training Guideline* at [www.vesi.com.au](http://www.vesi.com.au).

Training providers shall document:

- Assessment methods.
- Process for recognition of prior learning.

### 1.3.4 Mobile Plant Operators

Operators of mobile plant shall be provided with information, instruction, or training to operate the plant in the electrical environment.

The information, instruction or training shall include a description of the hazards of movement of mobile plant in proximity to live overhead conductors and detail precautionary measures which may be taken to ensure safe operation.

### 1.3.5 Training Records

Organisations shall maintain systems for recording of all training and authorisations.

## 1.4 Network Authorities

### 1.4.1 Network Authority Types

Authority types covered by these Rules are:

- Receive Access Permits
- High Voltage Switching
- Enter Enclosures
- Make Application for
- Receive Sanction for Test

### 1.4.2 Withdrawal or Suspension of a Network Authority

An authority may be withdrawn, suspended, altered, or reviewed when it is apparent the person concerned:

- Has an expired authority.
- Requires additional training or are assessed as not competent.
- Is unable to perform activities within the scope of the authority due to any circumstance.
- Is subject to, or as the outcome of an investigation.

### 1.4.3 Work on Live High Voltage Overhead Lines

HV live work shall be performed only by Lineworkers who have been assessed as competent to the National Competency Standards unless in accordance with 1.3.1.

### 1.4.4 Work on Live Low Voltage Electrical Apparatus

Work on live LV electrical apparatus shall be performed only by workers:

- Who have been assessed as competent as per the *VESI Skills and Training Guidelines* for task performed; or
- An electrical apprentice/trainee working under a training program and effectively supervised. Refer to relevant Apprentice Supervision Guidelines available on [www.vesi.com.au](http://www.vesi.com.au).

A person may be trained and authorised to undertake a restricted electrical measurement, test and adjustment activity.

Electrically trained persons who, have previously held a delegated authority to work on live LV electrical apparatus and have been away from live LV work for one year or more shall be assessed in accordance with VESI training standards.

### 1.4.5 Work on Customer's Installations

AS/NZS 3000 work on customer's electrical installations shall be performed only by persons licensed by Energy Safe Victoria unless an Order in Council is given by Energy Safe Victoria to allow the activity.

# WORK IN THE VICINITY OF ELECTRICAL APPARATUS & SAFE APPROACH DISTANCES

## PART 2

INTRODUCTION

PART 1 - SAFETY, TRAINING & AUTHORISATIONS

PART 2 - WORK IN VICINITY OF ELECTRICAL APPARATUS & SAD

PART 3 - ACCESS FOR WORK ON OR NEAR HV ELECTRICAL APPARATUS

PART 4 - LV ELECTRICAL APPARATUS

PART 5 - WORK BY PERSONS NOT UNDER CONTROL OF DIST. NETWORK

### PRINCIPLES

Part 2 addresses the following Principles:

- *Work in the vicinity of electrical apparatus shall be carried out in a safe manner.*
- *Control measures taken shall be consistent with the risk and work performed.*
- *Persons shall observe appropriate Safe Approach Distances when working, or operating vehicles or mobile plant, on or near electrical apparatus.*

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## 2.1 Work in the Vicinity of Electrical Apparatus

### 2.1.1 General

For all work being carried out in the vicinity of electrical apparatus by VESI workers, training and/or written work instructions shall be available and followed or alternatively, organisational procedures and/or established work practices shall apply.

For all work by persons not under the control of the Distribution Network, refer to Part 5.

Organisational procedures shall include risk assessment processes which document and record control measures.

The control measures implemented shall minimise the risks involved and may include:

- Defining the work area
- Defining access routes
- Isolating and earthing the electrical apparatus
- De-energising live electrical apparatus adjacent to the work area
- The use of barriers and signs
- The use of approved covering
- The use of Safety Observers
- The issue of the appropriate Authority to Work in the Vicinity of Electrical Apparatus

### 2.1.2 Entry to Enclosures

#### Authorised

Where Authorised Persons are required to enter enclosures containing electrical apparatus, the Authorised Person shall ensure that the entry is performed safely and that appropriate precautions are taken.

These precautions may include but are not limited to:

- Job safety analysis.
- Site work permit system.
- Site safe work system.

#### Instructed

Where Instructed Persons are required to enter enclosures containing electrical apparatus, the Instructed Person, the Authorised Person, the person in charge of the site and the person in charge of the electrical apparatus shall ensure entry is performed safely and specific precautions are taken.

These precautions may include but are not limited to:

- Job safety analysis.
- HV awareness training.
- Site work permit system.
- Site safe work system.
- The provision of specific instructions as to the location of the enclosed or exposed conductors or terminations or apparatus.

An instructed person shall be identified as such to those responsible for their supervision.

### Ordinary persons

Where Ordinary Persons are required to enter enclosures containing electrical apparatus, entry shall be performed in accordance with approved precautions and they shall be effectively supervised by an Authorised Person.

These precautions may include but not limited to:

- Job safety analysis.
- Site work permit system.
- Site safe work system.
- The provision of specific instructions as to the location of the enclosed or exposed conductors or terminations or apparatus.

Please refer to section 2.3.4 for Safe Approach Distances – Authorised Entry to Enclosures

#### 2.1.3 Handling Objects and Loads

When objects are being handled manually or by mechanical equipment, care shall be exercised to prevent the objects or the mechanical equipment infringing SAD.

For manual handling, appropriate work methods and an appropriate number of persons shall be used to maintain SAD.

For mechanical handling where there is a risk of infringing the SAD to electrical apparatus, refer Section 2.6, the movement of loads shall be controlled by means of approved non-conducting ropes or other approved means.

Unless using approved HV Live work techniques, no person shall contact the load or any attached conducting objects until the risk of SAD infringement is removed. Only the plant operator shall contact the mobile plant controls in accordance with safe work procedures.

Approved lifting devices used as pole mounted lifting equipment, e.g., rope tackles and handlines, may be attached to pole structures by a suitably trained person maintaining at least the clearances in Table 1 between exposed live conductors and any part of the lifting device, gear, and load at all times.

#### 2.1.4 Installing, Replacing or Retiring of Overhead Conductors

When overhead lines (other than insulated or covered conductors), are being installed, replaced or retired, and there is possibility of contact with, or induction from, adjacent live conductors of any description, such conductors being moved shall be earthed by an approved device before work is commenced and shall remain earthed until the work is completed. A conductor that is erected shall be earthed before it is lifted from the ground.

When earthing is considered to be impracticable, or a safer control measure may be appropriate, alternative safety precautions shall be applied and may include the use of appropriate restraining devices to control such conductors when they are being moved.

At over or undercrossing positions, examples of appropriate measures are:

- The application of an approved earthing device to bare conductors.
- Construction of temporary physical barriers, such as timber structures and non-conductive nets.
- Catenary runs with conductor retaining loops.



## 2.1.5 Use of Mobile Plant

Mobile plant shall only be used in the vicinity of live 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.

The control measures to be considered within a risk assessment and a JSA should include:

- Isolating and earthing electrical apparatus.
- Positioning the mobile plant such that the SAD can be maintained in all circumstances.
- The use of Safety Observers and barriers and signs.
- The use of other precautions such as physical restrictions or control devices in conjunction with barriers.
- The suppression of auto-reclose.
- The alteration of protection and control settings.
- De-energising the electrical apparatus.
- Mechanical limitation devices on mobile plant.
- Earthing of mobile plant refer to section 3.2.7.

When mobile plant is operated from outside the mobile plant, precautions shall be taken to protect the Operator from hazardous step and touch potentials.

Where mobile plant (e.g., EWP) is not fully insulated, the insulation level of each part shall be labelled in accordance with the appropriate standard (e.g., AS1418.10) and the following permanent sign shall be fixed at all plant operator's control:

**DANGER BEWARE OF POWER LINES**  
**This appliance is not fully insulated. Do not permit any uninsulated part of this appliance to be in close proximity to live conductors.**

### 2.1.5.1 Testing of Mobile Plant

Insulated mobile plant used in the vicinity of overhead lines shall be subject to HV electrical test on its insulated boom section/s in accordance with AS 1418.10.

Testing shall be conducted at six monthly intervals and marked to show the date of the next routine test. Variations in accordance with AS 1418.10 are acceptable to provide for orderly test programming and/or mobile plant built to a previous standard.

Periodic tests are intended to monitor the adequacy of the particular maintenance regime used and to confirm that no physical damage has occurred to insulated components. The period between tests may depend on the usage, adequacy of the maintenance regime and the environment in which the equipment has been operating.

The vehicle shall not be accepted as suitable for use in the vicinity of live overhead conductors unless it is within test date or in accordance with AS 1418.10.

## 2.1.6 Work by Ordinary Persons

Where ordinary persons are required to work in the vicinity of electrical apparatus, the Ordinary Person performing the work, the person in charge of the work and the person in charge of the electrical apparatus shall all co-operate to ensure that the work is performed safely, and that specific precautions are taken.

### 2.1.7 Work within Stations or on Multi-Circuit Overhead Lines with Multiple Asset Ownership

For work within stations or on multi-circuit overhead lines where electrical apparatus is owned by more than one organisation and work is adjacent to another organisation's exposed electrical apparatus, there shall be joint consideration and agreement reached to carry out the work in a safe manner.

Examples of other asset owners are:

- Traction companies
- HV customers
- Other VESI companies.

## 2.2 Safe Approach to Electrical Apparatus

### 2.2.1 General

Part 6 of the Electricity Safety (General) Regulations 2019 sets out minimum distances that persons, vehicles, mobile plant, and machinery that shall be maintained from an aerial electric conductor. Some of the safe approach distances specified in these Rules are less than minimum distances specified in the Regulations. It is a regulatory requirement that workers who adopt these safe approach distances must be provided with written permission or an authorisation from the Distribution Network to allow them departing from the minimum distances specified in the Regulations.

Safe Approach Distance (SAD) is based on an Exclusion Zone principle and is measured out from the energised conductor.

This principle defines an area around an exposed conductor as shown in Figure 1, into which no part of the person, mobile plant or object (other than approved insulated objects) shall encroach unless in accordance with Parts 3 and 4.

Proper application of SAD requires consideration of the workspace necessary to perform the task or function and either working beyond reach or the use of controlled movements to stay outside the SAD.

Unnecessary approach to electrical apparatus or unnecessary contact with parts not regarded as live shall be avoided.

Necessary approach to electrical apparatus shall be kept to a minimum and shall be restricted to the period required to perform the work.

Work practices shall be established to ensure persons, mobile plant and unapproved objects do not encroach the SAD. These work practices shall include consideration of:

- Working Beyond Reach of the exclusion zone wherever practicable.
- Precautions to be applied when use of controlled movement is necessary.
- The work space required including the expected reach of persons performing the work; and
- The movement of mobile plant used for the work.

Expected reach shall include all intentional and expected movements such as adopting a work position, adjusting a hard hat, manoeuvring tools, and reaching for items being passed to the employee.

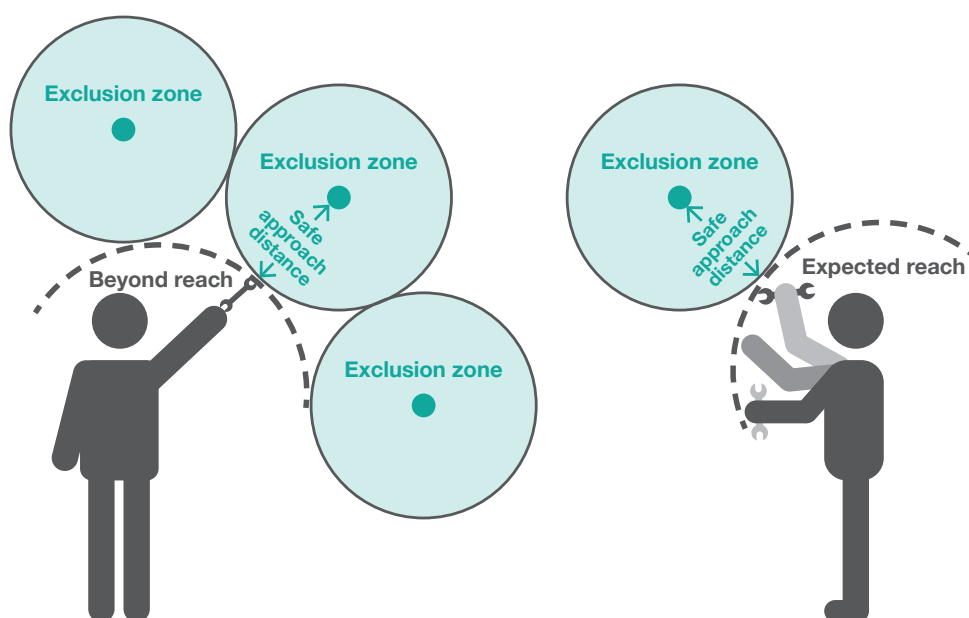


Figure 1 – Exclusion Zone Principle

**Vicinity** means a situation 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**.

**Near** means a situation where there is a reasonable possibility of a person, either directly or through any conducting medium (e.g. via mobile plant) coming within the relevant **safe approach distances**.

**Safe approach distance** means the minimum distance in air from exposed conductors that shall be maintained by a person, **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**.

**Conductor** means a wire, cable or form of metal designed for carrying electrical current.

**Exclusion Zone** means an area around the electrical apparatus into which no part of the person, mobile plant or object (other than approved insulated objects) may encroach.

### Differences between Safe Approach Distance, Near and Vicinity

## 2.3 Safe Approach Distance – Persons

### 2.3.1 General

The SAD specified in these Rules are based on work from a stable surface.

When working to SAD, appropriate allowance shall be made for conductor sag and sway and uncontrolled ground or footing movement. Persons shall apply controlled movements or Beyond Reach principles to avoid infringing SAD. Personal clearances when performing HV live work up to and including 66kV, refer to the *VESI Minimum Rules for Carrying out HV Live Work in Victoria*.

Persons undertaking works other than for or on behalf of VESI shall comply with the No Go Zone Guidelines as appropriate.

### 2.3.2 Safe Approach Distance – Ordinary Persons

An Ordinary Person is a person working for a Distribution Network without sufficient training or experience to enable them to avoid the dangers which electrical apparatus may create.

The SAD for an Ordinary Person approaching insulated, covered or exposed conductors is shown in Table 1, column 2.

### 2.3.3 Safe Approach Distance – Instructed and Authorised Persons

An Instructed Person is a person effectively supervised by an Authorised Person to enable them to avoid the dangers which electricity may create.

Instructed Person's SAD apply whilst undertaking duties under supervision or as instructed by an Authorised Person.

Where effective supervision is not provided to Instructed Persons, see *Ordinary Persons*.

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 SAD for an Authorised Person approaching insulated covered or exposed conductors is shown in Table 1, column 3.

### 2.3.4 Safe Approach Distance – Authorised Entry to Enclosures

A person Authorised to Enter Enclosures is a person who has been assessed as competent against an approved training standard to enter electrical enclosures unsupervised.

Persons who hold an Authority to Enter Enclosures may not hold any other authority type. This means their usual role when entering enclosures is limited to visual inspection and/or audit or work in the vicinity of electrical apparatus. Therefore, despite being classified as Authorised Persons, the SADs in Table 1 do not apply and persons Authorised to Enter Enclosures shall maintain the following SADs.

Safe Approach Distances in this instance do not apply to equipment that is enclosed and has a dead front, e.g., RMU switch gear at an indoor substation.

< 1kV AC = 300mm	>1kV but ≤ 22kV = 1000mm	> 22kV but ≤ 66kV = 2000mm
------------------------	--------------------------------	----------------------------------

**Note:** The SAD's described above do not apply to pole testers/asset inspectors who shall work in accordance with the safe approach distances described in Table 1.

### 2.3.5 Safe Approach Distance – Special

SAD-Special is the minimum distance to an exposed conductor beyond the reach of any part of the person's body or any conducting or unapproved object touching any part of the person's body.

SAD-Special shall only be considered where either SAD normal, EAP or live work techniques are deemed impracticable and shall be used only by Authorised Persons performing approved tasks. The VESI has published a list of approved tasks in the Guideline '*Approved Tasks for the Application of Safe Approach Distance – Special*' at [www.vesi.com.au](http://www.vesi.com.au).

Prior to applying SAD-Special, pre-planning assessments (including work crew onsite JSA) shall be conducted and documented.

The SAD-Special for Authorised Persons are detailed in Table 1, column 4.

Tasks requiring the use of SAD-Special shall only be undertaken by an electrically qualified person who holds an Authority to receive EAPs or SFT or an Authorised HV Operator in conjunction with the following control measures:

- Positioning of the worker, see Figure 2, to effectively control the risk of the specified distance being infringed by the use of the Beyond Reach principle. This includes any unapproved object or tool being held by the worker.
- Safety Observers shall be appointed and competent in the task being performed.
- Minimise the exposure at the SAD-Special.
- Addressing adverse impact of external influences on plant and equipment e.g., traffic, boom movement, footing.
- Addressing adverse impact of weather and environmental conditions (e.g., rain, lightning, wind, light, sag or sway of conductors).
- The work party shall consider the suppression of the auto-reclose function as part of the pre-work planning.

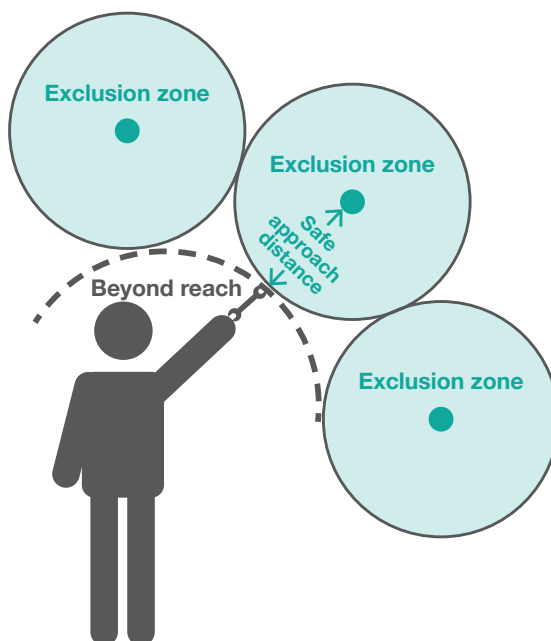


Figure 2 – Application of SAD-Special

**Table 1 – Personal Clearances**

Safe Approach Distance for Ordinary, Instructed or Authorised Persons			
All Safe Approach Distances apply to exposed conductors unless otherwise indicated	Ordinary Persons	Safe Approach Distance for Instructed Persons & Authorised Persons	Safe Approach Distance-Special for Authorised Persons Only Refer Clause 2.3.5
Nominal Phase to Phase AC Voltage kV	Safe Approach Distance mm	Safe Approach Distance mm	Safe Approach Distance mm
LV including communications catenary connected to LV neutrals	1500	Instructed Persons – No contact Authorised Persons – Insulated contact only	
Insulated LV	100		
Earthed metallic screened HV insulated conductor	100	Earthed metallic screened conductor – Contact only Unscreened conductor treat as exposed conductor	
Unscreened insulated HV conductor up to and including 66	2000		
HV up to and including:			
22	2000	700	450
33	2000	700	500
50	2000	750	700
66	2000	900	700
110	3000	1000	
132	3000	1200	
220	4000	1700	
275	5000	2300	
330	6000	2700	
400	6000	3300	
500	6000	3600	
Nominal pole to earth DC voltage (kV)			
1.5 or less	1500	Instructed Persons – No contact Authorised Persons – Insulated contact only	
+/- 25	2000	700	
+/- 85	3000	1000	
+/- 150	3000	1200	
+/- 270	4500	1800	
+/- 350	5000	2500	
+/- 400	6000	2900	
Note: For safe approach distances to fallen conductors, refer to 2.8			

## 2.4 Safe Approach Distance – Vegetation Works

**Note:** Section 2.4 applies to persons performing vegetation works under the control of the Distribution Networks. Irrespective of a person's VESI training and authorisation, they cannot apply VESI rules unless engaged directly by a VESI Network. When not engaged by a VESI Network, refer to Part 5 for guidance.

### 2.4.1 General Safety Principles for Vegetation Work

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

Considerations prior to commencing work shall include:

- That under certain conditions tree limbs can become conductive objects.
- The suppression of auto-reclose.
- Positioning of the mobile plant or climber such that the appropriate SAD can be maintained in all circumstances.
- The use of Safety Observers\*, barriers and signs.
- Consideration of weather and environmental conditions (e.g. rain, wind, light, sag or sway of conductors).
- Movement of the vegetation when cut e.g., for vegetation below conductors, it can be assumed that tree limbs will not normally move upward.
- The use of insulated barriers, protective covers and insulated equipment.
- Performing the work under EAP conditions.

\*A Safety Observer shall be appointed in accordance with the requirements of Clause 1.1.12.1.

Additional means of controlling the movement of limbs being cut shall be assessed and control measures implemented as appropriate.

Persons undertaking vegetation work utilising EWP's, climbing, or ground work techniques, shall be suitably trained and competent to apply those techniques.

At no time shall personal SAD be infringed, which includes any uninsulated tool or extension being used by the worker. Where these clearance requirements cannot be met, or where vegetation is encroaching the vegetation SAD or Live Cutting Zone for HV (Figure 3), either of the following shall be applied:

- Undertake the works under de-energised conditions; or
- Undertake the works utilising HV live work techniques in accordance with Clause 2.4.5.

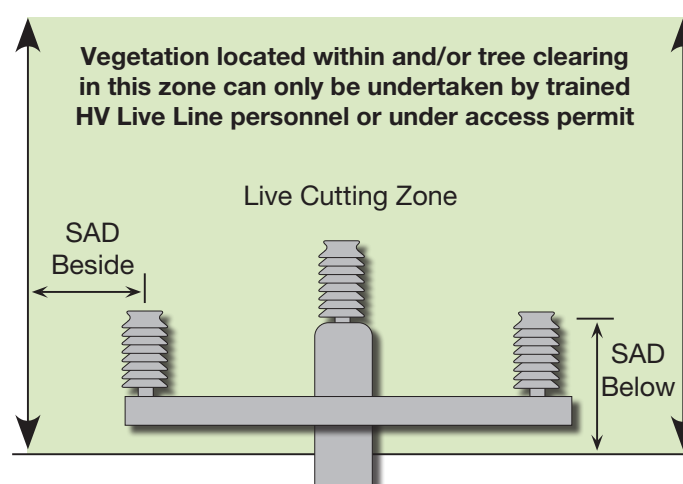


Figure 3 – Live Cutting Zone



## 2.4.2 Vegetation Works – from an Insulated Elevating Work Platform

Vegetation management workers performing work utilising an insulated EWP, tools, plant and equipment near live overhead conductors, shall be Instructed or Authorised Persons and maintain the SAD for personal and vegetation clearances as listed in Table 2.

Vegetation overhanging and/or contacting exposed LV conductors can be cut provided appropriate precautions are implemented and the movement of limbs being cut can be controlled.

Workers utilising an uninsulated EWP shall refer to Clause 2.6 – Safe Approach Distance of Uninsulated Mobile Plant in the Working Mode.

**Table 2 – Clearances for Mobile Plant – Vegetation**

Safe Approach Distances and Vegetation Clearances for Instructed and Authorised Persons utilising insulated EWP, tools, plant and equipment				
Nominal Phase to Phase AC Voltage kV	Insulated Mobile Plant mm	Instructed & Authorised Persons mm	Vegetation Clearance	
			Below (not including overhanging HV) mm	Beside (not including overhanging HV) mm
LV	Contact Allowable	Physical Clearance	No Clearance required	
11	700	700	100	400
22	700	700	150	400
33	700	700	200	400
66	1000	1000	400	700
Covered aerial HV up to 33kV	700	700	100	100

## 2.4.3 Vegetation Works – When Climbing

Vegetation management workers performing work from within a tree near live overhead conductors, shall be Instructed or Authorised Persons and maintain the SAD for personal and vegetation clearances as listed in Table 3.

Vegetation overhanging exposed LV conductors can be cut provided there is a minimum of 3000mm vegetation clearance above conductors, and the movement of the vegetation being cut can be controlled.

Climbers shall not climb any vegetation where any part of it is within or may move within the vegetation clearance distances in Table 3 during the work activity.

Climbers shall not be positioned so that they could fall or swing into the conductors or in any way breach the distances listed in Table 3.

## 2.4.4 Vegetation Works – When Working from Ground

Vegetation management workers performing work from the ground where the tree is near live overhead power lines, shall be Instructed or Authorised Persons and shall maintain the SAD for personal and vegetation clearance as listed in Table 3.

Clearing vegetation from the ground that is beside live conductors shall only be undertaken using controlled cutting or felling techniques, and provided that the movement of the vegetation being cut can be controlled.



Vegetation overhanging exposed LV conductors can be cut, provided the movement of the vegetation being cut can be controlled and personal and vegetation SAD's can be maintained at all times.

**Table 3 – Clearances When Climbing or Working From Ground**

Safe Approach Distances and Vegetation Clearances for Instructed and Authorised Persons performing vegetation works when climbing or working from ground level		
Nominal Phase to Phase AC Voltage kV	Instructed & Authorised Persons Personal Clearances (includes uninsulated tool or extension) mm	Vegetation Clearances BELOW and BESIDE (not including overhanging HV) mm
Insulated LV	200	Contact allowed
Exposed LV	1000	Contact allowed
11	1200	700
22	1200	700
33	1200	700
66	1400	1000

**Note:** The clearances in Table 3 are derived from Table 2 of the ENA Guidelines for Safe Vegetation Work Near Live Overhead Lines.

#### 2.4.5 Vegetation Activities Over High Voltage

Only persons assessed as competent HV Live Workers and utilising HV live techniques, are permitted to clear tree limbs overhanging the Live Cutting Zone to HV conductors in accordance with the *VESI Vegetation Management Guidelines*.

## 2.5 Safe Approach Distance – Vehicles

### 2.5.1 Vehicles Controlled by Ordinary, Instructed or Authorised Persons

An Ordinary Person in charge of any vehicle, excepting mobile plant when in working mode, shall ensure that no part of the vehicle or its load is placed or moved within the distances shown in Table 4, column 2.

Authorised and Instructed Persons in charge of any vehicle, excepting mobile plant when in working mode, shall ensure that no part of the vehicle or its load is placed or moved within the distances shown in Table 4, column 3.

**Table 4 – Vehicle Clearance**

Safe Approach Distances for Vehicles excepting mobile plant when in the working mode		
All Safe Approach Distances apply to Exposed Conductors unless otherwise indicated Nominal Phase to Phase Voltage (AC)	Safe Approach Distances for Vehicles under the control of Ordinary Persons	Safe Approach Distances for Vehicles under the control of Instructed or Authorised Persons
kV	mm	mm
LV exposed conductor and catenary connected to LV neutrals	600	600
LV insulated or earthed metallic screened HV insulated conductor up to and including 66	600	No Contact
HV up to and including 33 and unscreened HV insulated conductor	1000	700
50	1000	750
66	1000	1000
110	1500	1000
132	1500	1200
220	4600	1800
275	4600	2300
330	5500	3000
400	6400	3300
500	6400	3900
Nominal Pole to Earth DC Voltage (kV)		
+/- 25	1000	700
+/- 85	1500	1000
+/- 150	1500	1200
+/- 270	4600	1800
+/- 350	5500	2500
+/- 400	6400	2900

## 2.6 Safe Approach Distance – Uninsulated Mobile Plant in the Working Mode

### 2.6.1 General

The SAD specified in these Rules are based on work from a stable surface.

Appropriate allowance shall be made for conductor sag and sway and uncontrolled movements of vehicles or plant due to any reason.

A Safety Observer is required unless the mobile plant is incapable of infringing the SAD.

When lifting a load, the conductors shall be suitably insulated in accordance with organisational procedures.

When using uninsulated mobile plant for HV live work up to and including 66kV, refer to the *VESI Minimum Rules for Carrying Out HV Live Work in Victoria*.

Planning for the use of uninsulated mobile plant in the working mode shall include consideration of:

- The issue of an Electrical Access Authority to allow the conductors to be contacted and lifted or pushed out of the way; or
- Arrangements being made with the person in charge of the HV conductors (including circuits not controlled by the Distribution Network) to be temporarily and securely repositioned to provide the specified clearance; or
- Working under HV live work procedures.
- The fitting of approved insulating covers to live LV conductors that will enable the lifting or pushing of the conductors out of the way to provide clearance over mobile plant or its load.

Persons outside of the VESI shall comply with the No Go Zone Rules.

### 2.6.2 Operated by Ordinary Persons

An Ordinary Person operating mobile plant shall ensure that the mobile plant, its equipment, and load are not placed or moved closer than the specified distances shown in Table 5.

**Table 5 – Working Mobile Plant Clearance**

Safe Approach Distance for Mobile Plant when in the Working Mode			
All Safe Approach Distances apply to exposed conductors unless otherwise indicated Nominal Phase to Phase Voltage (AC)	Safe Approach Distances for mobile plant operated by Ordinary Persons (including insulated mobile plant)	Safe Approach Distances for any UNINSULATED section of mobile plant operated by Instructed or Authorised Persons	Safe Approach Distances for any appropriately INSULATED section of mobile plant operated by Instructed or Authorised Persons
kV	mm	mm	mm
Low Voltage exposed conductor and catenary connected to LV neutrals	2000	1000	Contact allowable
Low Voltage insulated or earthed metallic screened HV insulated conductor up to and including 66	2000	No Contact	Contact allowable
HV up to and including 33 & unscreened HV insulated conductor	2000	1200	700
50	2000	1300	750
66	2000	1400	1000
110	4000	1800	1200
132	4000	1800	1200
220	4600	2400	1800
275	4600	3000	2300
330	5500	3700	3000
400	6400	4000	3900
500	6400	4600	3900
Nominal Pole to Earth DC Voltage kV			
+/- 25	2000	1200	700
+/- 85	4000	1800	1000
+/- 150	4000	1800	–
+/- 270	4600	2400	–
+/- 350	5500	3200	–
+/- 400	6400	3600	–

### 2.6.3 Operated by Instructed or Authorised Persons

An Instructed or Authorised Person operating mobile plant shall ensure that the mobile plant, its equipment, and load do not approach closer than distances in Table 5, unless in accordance with an Access Authority.

When working under HV live work procedures, refer to the *VESI Minimum Rules for Carrying Out HV Live Work in Victoria*.

The use of helicopters for barehand live line work is excluded from the requirements of this Clause.

### 2.6.4 Safe Approach Distance – Task Specific for Uninsulated Mobile Plant

When a task requires a closer approach by uninsulated mobile plant to live conductors or cables than the normal SAD given in Table 5, alternative task specific SAD for mobile plant may be developed and applied with consideration of the requirements set out below:

- Be determined in accordance with ENA National Guidelines for SAD to Electrical Apparatus (ENA NENS 04) and related standards and guidelines as may be appropriate.
- Be applied only to a specific task or process which has been subject to a formal risk assessment carried out in advance of the work using a consultative process with subject matter experts.
- Be documented as an organisational procedure specific to the task or process.
- Endorsed by the relevant Distribution Network.

If clearances cannot be maintained, work shall be carried out:

- With conductors under an Access Authority; or
- Conductors fitted with approved insulating covers.

## 2.7 Safe Approach Distance – Insulated Mobile Plant

Insulated mobile plant shall only be operated by an Instructed or Authorised Person when working on or near live electrical apparatus.

An Instructed or Authorised Person operating mobile plant shall ensure that the mobile plant, its equipment and load do not approach closer than the distances in Table 5 unless in accordance with an Access Authority.

When working under HV live work procedures, refer to the *VESI Minimum Rules for Carrying Out HV Live Work in Victoria*.

The use of helicopters for barehand live line work is excluded from the requirements of this Clause.

## 2.8 Emergency Response

In emergency situations where there is a likely risk of electric shock to persons from electrical conductors or electrical apparatus, e.g.: fallen conductor:

- Prompt action shall be taken to ensure people are kept well clear of the hazard at greater than the SAD in accordance with organisational procedures.
- For fallen or exposed electrical conductors, and to allow for step potential, a minimum safety clearance of six metres for HV or two metres for LV shall be applied.

- All electrical apparatus shall be treated as live until proven de energised by approved means and normal SAD as a minimum shall apply after confirmation that the conductors will remain de energised.

Unplanned/fault work is not considered to be an emergency situation if life or property is not at immediate risk.

No approach within SAD shall be made to electrical apparatus until it is isolated and earthed/bonded by approved means as appropriate.

Where practicable an Instructed or Authorised Person is to remain on site to issue verbal warnings to any person making unsafe approach to fallen or exposed electrical conductors or access is controlled by the use of barriers or signs, e.g.: rope, ribbon, portable flashing lamps, traffic cones.

## 2.9 Contact with Live High Voltage Conductors by Means of Appliances

Only approved and tested insulated appliances shall be permitted to be brought within the SAD, or into direct contact with HV live conductors.

## 2.10 Approach to Live High Voltage Insulated Cables

### 2.10.1 General

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

Cables, which are specifically designed for movement whilst live, may be moved in accordance with organisational procedures.

Slight movement of other types of live cables may be permitted, but only after detailed consideration of all related circumstances by a person with a detailed knowledge of the cables concerned, who shall fully detail all precautions to be taken.

### 2.10.2 Earthed Metallic Sheathed or Screened High Voltage Cables

Contact by persons may be made to external non-conductive surfaces of HV live cables with earthed metallic sheaths or screens only after consideration of transferred earth potentials and induced voltages.

### 2.10.3 Non-Metallic Screened High Voltage Aerial Bundled Cable

No contact shall be made to external surfaces of live non-metallic screened HV aerial bundled cable or exposed support conductors. Suitable HV live work techniques only shall be used for this purpose.

Access to de-energised but not earthed non-metallic screened HV aerial bundled cable may be permitted in accordance with organisational procedures.

For the purposes of insulated mobile plant working in the vicinity of live non-metallic screened HV aerial bundled cable, the SAD shall be the same as exposed HV conductors, refer Table 5.

## 2.11 Work in Stations

A person shall not perform work in any station or allow mobile plant to enter any station without first obtaining the permission of the person in charge of the station and accepting conditions imposed by that person.

An Access Authority and/or Authority to Work in the Vicinity of Live Apparatus, refer Clause 2.1, shall be issued where:

- Mobile plant or EWP or other large vehicles will be used; or
- The work involves excavation or the use of explosives.

## 2.12 Work Outside of Stations

Work on or near electrical apparatus outside of stations shall only be performed after obtaining the permission and direction of the person in charge of the electrical apparatus.

## 2.13 Approach to Single Wire Earth Return (SWER) Transformers

Any person who approaches an in-service SWER transformer (either isolating or distribution type) to carry out work on or in the vicinity of the pole shall determine that the HV earthing system is effective and is not producing dangerous ground voltages. This shall be done in accordance with the VESI Safe to Approach test procedures and any additional requirements established by the organisation.

# ACCESS FOR WORK ON OR NEAR HIGH VOLTAGE ELECTRICAL APPARATUS

## PART 3

### PRINCIPLES

Part 3 addresses the following Principles:

- Only Authorised Persons shall undertake switching, earthing and associated duties on high voltage electrical apparatus.
- Earthing devices shall be applied by an Authorised Person following a safe to earth confirmation and placed to ensure the safety of the work party.
- An appropriate safe access system shall be applied before any work on or near HV electrical apparatus.
- High voltage electrical apparatus shall not be placed into service until it has been cleared for service.

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## 3.1 Operation of High Voltage Electrical Apparatus

### 3.1.1 Persons Authorised to Operate High Voltage Electrical Apparatus

Switching and associated duties on HV electrical apparatus should be performed by Authorised Electrical Operators and Network Controllers whose training, duties and instructions cover the particular electrical apparatus.

However, any person may perform operations in the following circumstances:

- When specifically instructed by, or authorised by, the appropriate Operating Authority.
- When specifically instructed by an Authorised Operator or Network Controller as part of training.
- In an emergency involving serious risk to persons or property.
- When controlling HV electrical apparatus as part of a task for process control in accordance with approved organisational procedures.

### 3.1.2 High Voltage Operator Protection

When HV electrical apparatus is operated, the person undertaking the task shall be protected from electric shock, flash and other hazards using approved methods and mandatory PPE, refer Clause 1.1.10.2 and Table 6.

### 3.1.3 High Voltage Switching

**Note:** Proximity testers e.g., Modiewark tester, shall not be used for safe to earth test on the screened section of underground cable, or any bundled cables

Prior to a HV switching operation, the available information regarding circuit conditions shall be taken into account and the electrical apparatus confirmed as fit for service. Any HV electrical apparatus found to be not fit for service shall be tagged in accordance with 3.1.4.

After switching, correct operation of the electrical apparatus shall be confirmed whenever possible.

All communications relating to the operation of, or access to, electrical apparatus shall be clear and definite. Electrical apparatus shall be referred to by name and sufficient detail to give positive identification.

Verbal switching instructions including changes to operating instructions shall be written down and confirmed by repeating back to avoid misunderstanding.

All other statements shall be confirmed by repeating back to avoid misunderstanding.

When switching, an Operator shall avoid uninsulated contact with any earthed conductive equipment (e.g.: conductive poles, earth conductors etc.). The Operator shall be suitably protected as outlined in Clause 1.1.10.2 and Table 6.

**Table 6 – Operator Protection**

Operator Protection		
INSIDE A STATION		
Apparatus	Action	Operator Protection
Circuit Breaker or other metal clad switchgear inside a Station operated manually by grasping a metal handle	Opening & Closing	1. Insulated gloves AND 2. Insulated medium
	Racking a circuit breaker or voltage transformer	3. Safety glasses OR full face shield 4. Sleeve – where practicable
Fully enclosed, fault rated earth switch or truck for metal clad switchgear inside a Station	Opening & Closing	1. Insulated gloves OR insulated medium AND 2. Safety glasses or full face shield
Metal clad switchgear inside a Station	Earthing via earth trucks or earth probes	1. Insulated medium AND 2. Safety glasses with side protection OR full face shield AND 3. Hand protection to protect against flash
Switches and isolators inside a Station operated manually by grasping a metal handle	Opening & Closing and Earthing	1. Insulated gloves OR sleeve AND 2. Safety glasses with side protection OR full face shield
Insulating stick operation of testing equipment, HV fuses, switches, isolators or portable earths	Opening & Closing or Applying	1. Operating stick AND 2. Safety glasses with side protection OR full face shield AND 3. Hand protection to protect against flash
OUTSIDE A STATION		
Switches operated manually by grasping a metal handle	Opening & Closing and Earthing	1. Insulated gloves AND 2. Insulated medium AND 3. Safety glasses with side protection OR full face shield 4. Sleeve – where practicable
Insulating stick operation of HV fuses, switches, isolators or portable earths	Opening & Closing or Applying	1. Operating stick AND 2. Safety glasses with side protection OR full face shield AND 3. Hand protection to protect against flash

**Notes:**

1. Insulated medium means a HV mat, two interleaved LV mats, a wooden or fibreglass ladder
2. All switches and isolators incorporating a metal handle installed within the boundary fence of a Station are fitted with an installed earth mat directly connected to the metal operating handle. The installed earth mat is connected to the Station earthing grid

### 3.1.4 Defective and/or Quarantined Equipment

Any in-service HV electrical apparatus found to be defective shall have a cautionary tag attached and/or be logged by Operating Authority. Tagged electrical apparatus shall not be operated without reference to the authority responsible for the electrical apparatus.

## 3.2 Earthing of High Voltage Electrical Apparatus

### 3.2.1 General

**Note:** Proximity testers e.g., Modiewark tester, shall not be used for safe to earth test on the screened section of underground cable, or any bundled cables

Earthing device types shall be suitably rated, approved and inspected prior to use.

Earthing devices shall be applied by an Authorised Person only after confirming it is safe to earth.

Confirmation of safe to earth shall be by:

- Visual inspection of isolation(s) and testing of the conductors.
- Where visual inspection of isolation(s) is not practicable, inquiry and testing shall be used.
- Where testing is not practicable, earthing may take place only in accordance with approved procedures.

In applying an earthing device, it shall be connected to earth before it is applied to the conductors, and it shall be removed from the conductors before it is disconnected from earth.

Wherever practicable, an earth shall be applied and removed with an approved device. When hand application or removal is unavoidable:

- All phases shall be discharged, and
- Another earth shall be held in contact with the conductor using an approved device while the hand applied earth is being attached or removed.

Earths shall be applied wherever practicable between the point of access and all sources of supply at the worksite, and be so placed as to remain effective even if adjoining pieces of electrical apparatus are disconnected.

Consideration should be given to the potential of electrical apparatus becoming disconnected due to protection devices within the access area.

When applying a portable earthing device, it shall be regarded as being liable to become live until the circuit earthing is complete.

There are some situations when applying earths to electrical apparatus during the preparation for access (e.g.: discharging capacitor banks), that an Authorised Electrical Operator cannot comply with the clearances specified as the SAD. In these situations, organisational procedures may permit such approach only to that part of the electrical apparatus which already has local isolation and earthing.

### 3.2.2 Operational Earths

Other than in accordance with Clause 3.2.4, when earthing electrical apparatus for access, the first earth applied shall be an operational earth. Additional operational earths may be applied under instruction from the Operating Authority.

Operational earth/s shall be applied and removed by an Authorised Electrical Operator or a suitably trained person under the direction of an Authorised Electrical Operator.

Other than in accordance with Clause 3.2.4, operational earth/s shall be applied prior to the issue of an Access Authority and shall remain effective during the currency of the work.

All operational earths shall be listed on the EAP and shall be under the control of the Operating Authority. Operational earths shall not be removed from electrical apparatus under EAP without permission from the Operating Authority.

Any operational earth may also act as worksite earth if it is attached within sight of the work party.

### 3.2.3 Worksite Earths

After access has been given to HV electrical apparatus, worksite earths shall be applied as necessary to maintain the safety of the work party and to visually indicate the condition of the electrical apparatus.

Worksite earths should be applied within the accessed area in the order of preference set out in Clause 3.2.6.1 and shall be listed in the appropriate section of the EAP.

Earths applied by the work party are defined as worksite earths under the control of the work party. They shall be attached and removed by appropriately trained persons.

An operational earth, designated and/or used by a work party as a worksite earth, shall remain under the control of the Operating Authority.

### 3.2.4 Absence of an Earth on High Voltage Electrical Apparatus Under an Electrical Access Permit

Wherever practicable electrical apparatus shall be earthed before the issue of an EAP.

Where an earth has not been applied to electrical apparatus prior to the issue of an EAP, the Recipient in Charge shall arrange for discharging of the electrical apparatus before any Recipient touches the HV conductors.

### 3.2.5 Removal of Operational Earth/s When Working Under an Electrical Access Permit

During work under an Access Authority, the Recipient in Charge may request approval to remove an operational earth/s for meggering, reconductoring, or other purposes, only if such action is considered necessary and safe, and provided:

- The Operating Authority is consulted and confirms that the removal of the earth will not affect any other Access Authorities on issue; and
- All persons likely to be affected by the removal of the earth are notified; and
- Consideration is given to induced voltages.

The earth removed shall be replaced in the same, or other equally effective position, as soon as possible.

### 3.2.6 Earthing of Overhead Lines and the Priority Earthing System

Where an overhead line can only be earthed using temporarily driven earth spikes, the work planning shall consider protection from the hazards resulting from energisation and step and touch potentials, refer to Clause 3.2.6.1 for priority earthing.

During the discharging and earthing of overhead lines, no person/s other than the one/s applying the earth shall approach within six metres of the earthing device, its connections or ladders, poles or structures from which the earthing device is being applied.

In situations where there is the risk of a worker becoming subject to different potentials across or between different earths, the hazard may be reduced by the application of equipotential work zone principles.

Where work under an EAP involves the connection, cutting or disconnection of conductors, then where practicable, approved bridging leads shall be applied across the proposed conductor break. Alternatively, earths shall be applied to both sides of, and as close as practicable to, the proposed break and connected to a common earth.

### 3.2.6.1 Priority Earthing Preferences

The choice of connection for a portable earthing device should be made on the basis of the following order of preference and shall be applied as closely as reasonably practicable to the worksite:

1. The neutral conductor of a Common Multiple Earthed Neutral (CMEN) System (not to be confused with a Multiple Earthed Neutral (MEN) System).
2. Permanently installed HV earthing system.
3. Earthing ferrule in a concrete pole.
4. The ground rod of an installed pole stay or permanently driven pole stakes.
5. A temporarily driven spike.

### 3.2.7 Earthing of Mobile Plant

Mobile Plant shall be earthed in accordance with table 7 using the following earthing hierarchy and notes:

1. Permanently installed HV earthing system.
2. Earthing ferrule in a concrete pole.
3. The ground rod of an installed pole stays or permanently driven pole stakes.
4. A temporarily driven earth electrode.

Plant shall be earthed via a conductor from the chassis to earth system

**Table 7 – Earthing of Mobile Plant**

Work Environment	De-energised LV	Live LV	De-energised HV	Live HV	All HV Enclosures
Insulated – Transit	Nil	Nil	Nil	Nil	Trailing Earth
Insulated – Operation	Nil unless required to eliminate induction issues	Nil unless required to eliminate induction issues	Nil unless required to eliminate induction issues or as part of an equipotential bonding system	Earthing required	Permanently installed earthing system
Un-insulated – Transit	Nil	Nil	Nil	Nil	Trailing Earth
Un-insulated – Operation	Nil	Earthing required	Nil unless required to eliminate induction issues or as part of an equipotential bonding system	Earthing required	Permanently installed earthing system

#### NOTES:

1. Earthing of insulated mobile plant is not required when performing short term LV work (e.g., public lighting maintenance or servicing connection work) on poles carrying live HV and the SAD for mobile plant is maintained if:



- a. Work does not exceed 30 minutes.
  - b. Conductors are not displaced (not including service cables).
  - c. There is minimal movement of the insulated mobile plant.
2. Where a structure has multiple voltages the standard for the highest voltage shall apply, e.g., when performing work on de-energised LV on a pole that has live HV, the live HV standard shall apply
3. Where two or more items of mobile plant are in working mode at the same structure over 2 metres apart, they shall be separately earthed.
4. Where separate items of mobile plant are in working mode closer together than 2 meters apart, they shall be bonded together or connected to the same earthing point.
5. Where separate items of mobile plant are in working mode on the same structure with energised HV and they are separately earthed, if one item of plant is uninsulated that plant shall be connected to the most effective earth.
6. In service HV SWER earths are not suitable for earthing plant
7. Plant earthing electrode shall be installed minimum of 6 meters from live HV SWER earth installation
8. LV Neutral conductor connected to established Common Multiple Earth Neutral (CMEN) earthing systems or Multiple Earthed Neutral (MEN) low voltage earths are not suitable for earthing plant.
9. For HV Live Work, refer to the [\*VESI Minimum Rules for Carrying out High Voltage \(HV\) Works In Victoria\*](#) or organisational procedures where equivalent or higher level safety measures apply.

### 3.2.8 Hazard Management When Earthing

#### 3.2.8.1 Overhead Lines and Apparatus

To manage the hazards of step and touch potential, when overhead lines or apparatus are being earthed, no person/s other than the one/s applying the earth/s shall approach within six metres of the earthing device, its connections or ladders, poles or structures from which the earthing device is being applied.

#### 3.2.8.2 High Voltage Metal Clad Switch Units

Earthing of metal clad switchgear and connected circuits by the use of probes, earth trucks or other contact extension devices requiring manual application presents additional hazards. Therefore, organisational procedures shall define such methods of earthing to minimise the risk to the Operator.

Procedures shall include a Safety Observer to be present during such earthing, unless specifically approved by organisational procedures for application by one person.

#### 3.2.8.3 High Voltage Capacitors

A safe method of discharging high voltage capacitors prior to access shall be included in approved procedures.

When earthing HV capacitors, the actives and where available the neutrals shall be earthed and, in addition, each capacitor shall be discharged before it is touched.

The same precautions shall be taken for work on electrical apparatus which incorporates HV capacitors (e.g.: capacitor voltage transformers, carrier coupling capacitors).

### 3.2.8.4 Aerial Supervisory Cables

Aerial supervisory cable shall be regarded as a screened and insulated live LV cable and all appropriate procedures and precautions for such cables shall be followed. Such precautions are required because of induction from parallel HV lines.

When an aerial supervisory cable is being jointed or re-terminated, initially both the screen and catenary wires of both cables shall be bonded and earthed at the worksite. These shall then be insulated in an approved manner and the work on the cables shall proceed in an insulated situation.

As a minimum the catenary wire of aerial supervisory cables is permanently earthed at alternative sectionalising points to provide safe working conditions.

Any work involving the disconnection of the catenary wire from the permanent earth shall not proceed until the catenary wire is earthed by means of local temporary earths attached to both sides of the sectionalising point.

## 3.3 Access Procedures for High Voltage Electrical Apparatus

### 3.3.1 General

No person shall touch or work near the HV conductors of any electrical apparatus unless:

- The person is a Recipient of an EAP covering that electrical apparatus and the HV conductors have been discharged and/or earthed at the worksite, and the EAP is available for reference at the worksite; or
- The person is a Recipient of an EAP covering the conductors of a HV cable and the de-energised state of the cable at the worksite is confirmed in accordance with Clause 3.3.3.9 and the EAP is available for reference at the worksite; or
- 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; or
- The person is working under the terms of an SFT on that electrical apparatus; or
- The electrical apparatus has been declared as out of commission in accordance with Clause 3.3.2.5; or
- The person is performing live work in accordance with organisational training and/or procedures; or
- The person is working in accordance with the requirements of an appropriate Permit to Work Adjacent to Network Assets, refer to Part 5, or
- The person is working in accordance with the SAD and work in the vicinity of electrical apparatus requirements of Part 2.

### 3.3.2 Planning Considerations for Electrical Access

#### 3.3.2.1 Application for Electrical Access

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

- Work method.
- Work environment.
- Skills and authorisations of the work party.

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



### 3.3.2.2 Multiple Access Authorities on the same Electrical Apparatus

When an EAP is issued along with any other Access Authority (e.g., another EAP, Permit to Work) on the same electrical apparatus, there shall be co-ordination in planning and performing the work to ensure that the actions of one party shall not endanger the safety of others.

### 3.3.2.3 Multiple Working Parties on a Common Access Authority

Work under a common EAP by separate parties shall be performed under the following terms:

- The work shall be co-ordinated by a person who has an overall appreciation of all aspects of the work to be performed.
- An application for EAP shall include:
  - details of work to be done by each work party; and
  - any special requirements to establish and maintain the safety of all work parties throughout the duration of the Access Permit.
- The Recipient in Charge:
  - should be a representative of the group responsible for the major portion of the work;
  - shall be thoroughly instructed in the work to be done and procedures to be used by each party;
  - shall be consulted in any discussion of proposed change in precautions brought about by changes to the electrical apparatus during the work.

### 3.3.2.4 Multiple Operational Control

Where an EAP is to be issued on electrical infrastructure under the control of more than one organisation, a protocol shall be established between these organisations for processing the application and outage requirements

### 3.3.2.5 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 Electrical Access Authority.

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

## 3.3.3 Preparing High Voltage Electrical Apparatus for Access

### 3.3.3.1 General

High voltage electrical apparatus should not be regarded as being safe for the issue of an EAP until it has been isolated and earthed.

Wherever practicable, isolation points shall be tagged.

Consideration shall be given to the isolation of sources of supply from low voltage, secondary circuits or alternative energy sources such as motor generator sets, photo voltaic cells, lightning and induction.

For remote controlled electrical apparatus, consideration shall be given to the disabling of the remote control function, or that the remote control has been made inoperative by other approved means, before starting work on the electrical apparatus.

Isolation for access shall either be visible, or an approved means used to confirm that the electrical apparatus is de-energised.

**Note:** Such isolation may not eliminate the effects of electric fields or magnetic induction.

Earths shall be applied as described in Clause 3.2.2. Operational Earths.

Exposed overhead conductors should be earthed prior to the issue of an EAP.

If earthing is impracticable on other asset types (e.g., HV ABC), appropriate precautions shall be taken to ensure the electrical condition of the apparatus and the remote ends of the cable shall be confirmed as isolated and de-energised. The Authorised Electrical Operator shall advise the Recipient in Charge and record the absence of an earth on the EAP.

Where access is required to both HV and LV electrical apparatus, refer to Clause 4.3.3 Co-ordination of LV and HV Access Switching Activities.

### 3.3.3.2 Isolation of High Voltage with Interconnected Low Voltage

Procedures for preparing access to HV electrical apparatus connected to substations with interconnected LV shall be based on the following concepts:

- Where a substation is connected to HV electrical apparatus being made dead for access and the LV reticulation from that substation is capable of being made live by direct switching or bridge connections, that LV reticulation or substation transformer shall be considered as a 'source of supply'.
- Isolation of such transformers and/or LV reticulation is part of the access procedure and each isolation shall be tagged and recorded on the Access Authority/s.
- Two or more isolations in series do not remove the need for earthing or bonding.

### 3.3.3.3 Isolation of High Voltage with Non-Interconnected Low Voltage

Procedures for preparing access to HV electrical apparatus connected to substations with non-interconnected LV shall be based on the following concepts:

- Where there is no possible interconnection of LV electrical apparatus with other HV/LV systems, the EAP shall include the notation 'LV is not interconnected'.
- Where isolation of LV supplies on non-interconnectable LV networks is not practicable, appropriate earthing/bonding at the worksite shall apply.

### 3.3.3.4 Earthing of High Voltage for Access

An Authorised Electrical Operator shall apply, or supervise the application, of all operational earths to isolated electrical apparatus prior to the issue of an EAP.

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

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

Operational earths attached to conductors shall be recorded on the Access Authority prior to issue.

Additional work party earths applied during the currency of the Access Authority shall be recorded.

Whilst making and breaking bridge connections, both sides of the bridge connection shall be maintained at the same potential.

If earthing is impracticable other appropriate precautions shall be taken and the Authorised Electrical Operator shall advise the Recipient in Charge and record the absence of an earth on the EAP.

### 3.3.3.5 Use of a Statement of Condition of Apparatus (SCAP)

A SCAP is a documented statement issued by one Operating Authority to another, stating the condition of the specified electrical apparatus or plant controlled by the issuing authority. It is used in circumstances where the stated conditions are required as precautions for the issue of an Access Authority issued by the receiving Operating Authority.

The SCAP specifies the state of the electrical apparatus or plant covered and does not by itself authorise work on the electrical apparatus or plant.

The stated conditions shall be maintained unless changed in accordance with the provisions referred to in this Clause, or until the SCAP is relinquished by the receiving authority.

Any earths listed on the SCAP may be removed as requested by the Recipient in accordance with Clause 3.2.5.

The SCAP shall where practicable detail all relevant precautions taken for the safety of the work party/ies.

Where it is not practicable to detail all such precautions, a general statement of the condition of the electrical apparatus (e.g. isolated and earthed) is acceptable provided that:

- It is acceptable to the Operating Authorities.
- It is acceptable to all Recipients on the associated EAP or SFT.

At the time of issue, the issuing Operating Authority shall describe and show the electrical apparatus covered by the SCAP and the precautions taken to the satisfaction of the receiving Operating Authority Recipient.

**Note:** Where it is not practicable to show each SCAP isolation physically, other forms of communication, photographic, video evidence of the isolations can be provided.

Where a general statement is used and any isolation point is to be changed (whilst still maintaining general condition of isolation), prior agreement shall be obtained from all affected Operating Authorities.

The receiving Operating Authority shall consult with Recipients of affected Access Authorities before agreeing to any change.

SCAP details shall be cross referenced and included in precautions taken in section B of any associated EAP or SFT.

The receiving authority shall keep records of the issue and cancellation of SCAPS or VSCAPS.

### 3.3.3.6 Use of a Verbal Statement of Condition of Apparatus – Plant (VSCAP)

VSCAPs shall only be used between electricity supply Operating Authorities when:

- There is mutual agreement to their use; and
- They have established procedures and systems for the centralised logging of information both given and received, regarding the condition of electrical apparatus; and
- The procedures and systems guard against the inadvertent operation or restoration of electrical apparatus.

The network representative receiving the VSCAP shall be responsible for the issue of relevant Access Authorities.

Any earths installed for the issue of VSCAP may be removed as requested by the Recipient in accordance with Clause 3.2.5.

Recipients of those Access Authorities need not be specifically authorised to work on the assets of the network operator who issued the VSCAP.

### 3.3.3.7 Barriers and Signs

#### General

Appropriate barriers shall be used where necessary to indicate areas containing live electrical apparatus and the degree of hazard.

Barriers shall not be altered or crossed except by persons identified in organisational procedures.

Appropriate signs shall be used where necessary:

- To identify electrical apparatus covered by an Access Authority.
- To identify adjacent live electrical apparatus and related hazards.

#### Hazards which are likely to be life threatening

Situations where there is an immediate and probable risk of contact with live electrical apparatus shall be defined by the use of danger barriers and/or signs. e.g.:

- Areas where the SAD cannot be maintained.
- Areas in which HV testing is in progress.

#### 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, shall be used, e.g., between work areas and adjacent areas containing HV live electrical apparatus which does not present an electrical hazard to normal pedestrian movement.

#### Descriptions of Barriers and Signs

##### **Live (Alive) Sign**

Approved danger sign having the word ALIVE.

ALIVE printed in white upon a red background or otherwise conforming to AS1319.

##### **Danger Barrier and/or Sign**

A barrier and/or sign of suitable material coloured red or alternatively red and white, to indicate the presence of danger, or otherwise conforming to AS1319.

##### **Under Access Permit Sign**

A sign of appropriate dimensions having the words UNDER ACCESS PERMIT or similar printed in white on a green background or otherwise conforming to AS1319.

##### **Under Sanction for Testing Sign**

A danger sign of appropriate dimensions having the words UNDER SANCTION FOR TESTING printed in red on a white background or otherwise conforming to AS1319.

##### **Warning Barrier and/or Sign**

A barrier and/or sign of suitable material, coloured yellow, or alternatively yellow and black, to indicate the need for a warning, or otherwise conforming to AS1319.

##### **Barriers and Signs for EAP**

Prior to the issue of an EAP, barriers and signs shall be erected:

- To make it clearly evident which electrical apparatus is under EAP and which is not.
- To guard against mistaken or inadvertent contact with other electrical apparatus.

The above shall be achieved with the use of appropriate signs and barriers including Alive signs and Under Access Permit signs. In positioning signs and barriers consideration shall be given to all approaches to the work area.

Additional barriers and signs may be erected after the issue of the EAP by agreement between the Authorised Electrical Operator and the Recipient in Charge.

In zone substations and terminal stations, barriers and signs shall be used.

In Distribution Networks the following applies:

- In particular instances where identification is positive, such as on some high voltage overhead lines and underground cables, and providing appropriate safeguards have been taken, approved procedures may dispense with the use of barriers and/or signs.

### **Barriers and Signs for Sanctions for Testing**

Prior to the issue of an SFT, barriers and signs shall be erected:

- To make it clearly evident which electrical apparatus is under SFT and which is not.
- To guard against mistaken or inadvertent contact with other electrical apparatus and/or equipment under test.

The above shall be achieved with the use of appropriate barriers including Danger barriers and signs, Alive signs and Under Sanction for Testing signs. In positioning barriers and signs, consideration shall be given to all approaches to the work area.

Additional barriers and signs may be erected after the issue of the SFT by the Tester in Charge.

### **3.3.3.8 High Voltage Metal Clad Switchgear and Associated Electrical Apparatus**

For the purpose of issuing an EAP, 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, see also Clause 3.3.1.

For work on busbar circuits, where the physical separation of circuits within a chamber is not visibly evident, additional precautions shall be taken for the safety of the working party.

The proposed means of access within metal clad chambers shall be described at the time of the application to the Operating Authority by the Applicant and both shall agree on the extent of access and that such access is safe. The extent of access shall be confirmed between the Electrical Operator and the Recipient in Charge prior to issue of the EAP.

When access is required within spout bushings the contacts shall be confirmed as de-energised by an approved test. The circuit shall also be earthed elsewhere, or other precautions taken to ensure that the spout contacts cannot become live by induction or other means.

When it is not practicable to earth metal clad circuits, a risk assessment shall be conducted to determine the special precautions, including discharging, to ensure that the conductors can be regarded as being at earth potential.

### **3.3.3.9 Working on Insulated Power or Supervisory 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 should be confirmed on site by positive identification or visually tracing it from one end or by the use of a spiking device.

## Spiking of Cables

A spiking or remote cable cutting device may be used to confirm that a cable is de-energised.

When a cable is to be spiked by a power operated spiking device, or cut with a remote cable cutting device the following measures shall be taken:

- Where practicable the electrical condition of the remote ends of the cable shall be confirmed as isolated and earthed; and
- The person in charge of the work shall personally select the cable to be spiked or cut after reference to the appropriate records and use of cable tracers where necessary; and
- An approved cable spiking device or remote cable cutting device shall be used by a person trained in its use and in accordance with approved procedures.

### Notes:

1. **Providing the earth screen of the HV cable is connected elsewhere to an established earth, the use of an approved cable spiking device satisfies the discharged and/or earthed requirement in the first dot point of Clause 3.3.1.**  
  
If the earth screen of a cable is not already earthed, then the approved cable spiking device shall be connected to a temporarily driven earth-stake before cable spiking takes place.  
  
Before spiking a cable, consideration shall also be given to the possibility of an additional source of “step-potential” arising from the presence of a temporarily driven earth-stake.
2. **It is acceptable, except where excessive induced voltages are involved, to work without an earth on a cable at a worksite, as required in Clause 3.2.3, providing that the cable is earthed at the remote ends and that initially the HV conductors are identified and discharged.**

Prior to spiking the Operating Authority shall be advised. The Operating Authority shall prevent the energising or re-energising of any cable in the vicinity of the proposed works until advised that spiking has been completed.

### 3.3.3.10 Working Under Induced Voltage Conditions

Whenever work is to be carried out on a cable core, sheath, armouring, oil line, etc. of a fully insulated cable system, careful assessment shall first be given to the voltage that may appear on the conductor via induction or other means and appropriate earthing practices and organisational procedures adopted.

## 3.3.4 Issue, Receipt and Duration of Electrical Access Permits

### 3.3.4.1 General

An EAP and an SFT shall not be on issue on the same electrical apparatus simultaneously.

HV live work and EAP work shall not be performed concurrently on a structure.

If it is necessary to change between glove and barrier work and EAP work, a clear transition point shall exist. All members of the work party shall be aware that the change process is occurring and act accordingly.

At all times EAP isolations shall remain unchanged.

No live work shall be carried out concurrently at over/under crossings of apparatus under EAP as the gap between the over/under crossing could be compromised.



EAPs shall be issued and cancelled only by an Authorised Electrical Operator, or a person specifically instructed by an Authorised Electrical Operator as part of training.

EAPs may be issued by telephone or radio subject to the statements between the Authorised Electrical Operator and the Recipient in Charge being confirmed by an Authorised Recipient as a witness at each location.

At the time of issue the Authorised Electrical Operator shall describe and, where practicable, show the electrical apparatus covered by the EAP and the precautions taken, to the Recipient in Charge and all the initial Recipients.

The Authorised Electrical Operator shall also describe or point out the nearest points of supply and adjacent live electrical apparatus. In the case of an EAP issued by telephone or radio, the Recipient in Charge shall assume these responsibilities.

Each EAP shall be issued to a Recipient in Charge. The Recipient in Charge shall ensure that all members of the work party who will approach the electrical apparatus sign on the EAP.

The issuer and Authorised Recipients all have a responsibility to ensure that the isolations and earthing documented in the EAP, are such that access to the relevant apparatus shall remain safe for the proposed work to be undertaken.

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

Subsequent to the issue of an EAP, additional Recipients may sign on the EAP, after appropriate instruction by the Recipient in Charge or by an Authorised Electrical Operator, acting with the knowledge of the Recipient in Charge.

### 3.3.4.2 Persons Permitted to Sign onto Electrical Access Permits

Recipients of an EAP shall be Authorised Recipients or Instructed Persons approved to work under that specific EAP. In the latter case it shall be the responsibility of the Recipient in Charge to ensure that Instructed Persons are placed under the effective supervision of an Authorised Recipient.

The conditions under which Authorised Recipients shall sign onto an EAP is that the Recipient:

- Understands the electrical apparatus covered and the limits of the EAP.
- Is satisfied with the precautions taken.
- Is aware of the nearest adjacent live electrical apparatus.

The conditions under which an Instructed Person shall sign onto an EAP 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 be effectively supervised by a nominated Authorised Recipient.

### 3.3.4.3 Responsibilities of an Authorised Electrical Operator

- Obtain approval from the Operating Authority prior to performing any switching on the electrical network.
- Correctly identify the electrical switching apparatus before the apparatus is operated.
- Report any switching performed in error, or anomaly encountered, immediately to the Operating Authority.
- Confirm that earthing is performed in accordance with these Rules.

- Fully describe to all Recipients the limits of and the precautions taken for the EAP.
- Ensure all Recipients at time of issue:
  - understand the limits of the EAP,
  - are satisfied with the precautions taken,
  - are aware of the nearest live electrical apparatus and
  - confirm that the Recipients are satisfied with those conditions.
- Ensure assets are fit for service prior to cancellation of EAP and restoration of supply.
- Notify the Operating Authority upon cancellation of the EAP and confirm that electrical apparatus is fit for service prior to restoration of supply.

#### 3.3.4.4 Responsibilities of Recipient in Charge

- Be informed of, and understand the limits of access to the apparatus and the control measures applicable.
- Ensure placement and removal of worksite earths and record on the EAP.
- 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 EAP, and sign off prior to relinquishment.
- Ensure all additional Recipients post issue:
  - understand the limits of the EAP,
  - are satisfied with the precautions taken,
  - are aware of the nearest live electrical apparatus and
  - confirm that the Recipients are satisfied with those conditions.
- Advise the Operating Authority of any lost or damaged EAP.
- Confirm electrical apparatus is fit for service prior to relinquishment of EAP.

#### 3.3.4.5 Responsibilities of Authorised Recipients

- Sign on the EAP to indicate they acknowledge the requirements of the EAP.
- 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 worksite earths and where required recording on the EAP.
- 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 EAP or provide advice to the Recipient in Charge otherwise. Seek approval for changes in precautions during the work.
- Ensure assets are fit for service prior to cancellation of Access Authorities and restoration of supply.

#### 3.3.4.6 Responsibilities of Instructed Persons

- Sign on the EAP under effective supervision of an Authorised Recipient.
- To indicate they acknowledge the requirements of the EAP.



- 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 EAP or provide advice to the Recipient in Charge otherwise.

#### 3.3.4.7 **Rejection of a Recipient**

A person shall recommend the exclusion from an EAP of any other person who at any time is considered unsafe as a Recipient. Such instances shall be reported promptly to the person in charge of the work.

#### 3.3.4.8 **Recipient Working Alone**

An EAP may be issued to one Authorised Recipient or a Recipient may work alone under the terms of an EAP in accordance with organisational procedures provided that:

- There is no exposed live electrical apparatus near the Recipient; or
- Warning notices are placed and suitable barriers are erected to prevent the Recipient inadvertently infringing the SAD to live electrical apparatus.

#### 3.3.4.9 **Issuer also a Recipient**

An issuer of an EAP shall not be the Initial Recipient in Charge, but may sign on the EAP as an Authorised Recipient.

In accordance with approved procedures, the issuer may sign-on as a subsequent Recipient in Charge.

#### 3.3.4.10 **Temporary Cessation of Work or Absence of Recipients**

Following a temporary cessation of work or when Recipients have been temporarily absent from the worksite, upon return each Recipient shall report to the Recipient in Charge to re-confirm the conditions of the EAP.

#### 3.3.4.11 **Work on Multi-circuit Overhead Lines**

Where more than one HV circuit is carried on a pole or line structure and work is to be performed on circuits under an EAP whilst others remain live, each Recipient of the work party who approaches near any circuits shall correctly identify the circuit/s under EAP and all other circuits.

For the movement of overhead conductors on multi-circuit lines, refer to Clause 2.1.4 *Installing, Replacing or Retiring of Overhead Conductors*.

#### 3.3.4.12 **RIC Replacement During Permit On Issue**

In the event of a person ceasing to act as Recipient in Charge, another Authorised Recipient shall become the Recipient in Charge and where practicable, the EAP shall be initialled by both. Further:

- The work party shall be advised of the change in Recipient in Charge; and
- This change of Recipient in Charge shall be communicated to the Operating Authority and recorded on the EAP.

#### 3.3.4.13 **Change of Electrical Access Permit Conditions**

Where it is required to change the isolations specified on an EAP, the EAP shall be cancelled and a new permit issued.

Other than changes to isolations, changes to the conditions specified and the precautions listed on the EAP shall only occur where mutually agreed upon by both the Operating Authority and the Recipient in Charge.

In all instances where changes are made to the conditions specified and precautions listed on the EAP, the appropriate Operating Authority shall ensure a check has been made regarding the requirements of other Electrical Access Authorities and all Recipients working under the EAP have been notified of all changes.

#### 3.3.4.14 **Suspension of an Access Authority**

Distribution Networks have not adopted suspension of Access Authorities due to current work practices.

#### 3.3.4.15 **Testing Under an Electrical Access Permit**

Testing under an EAP may be undertaken in accordance with organisational procedures that includes:

- A JSA is undertaken and the associated controls are applied to mitigate the risk of hazardous voltages and currents generated by testing.
- All other work shall cease for the duration of the testing; and
- No hazardous voltages and currents will be accessible as a result of the testing; and
- Recipient/s conducting the testing have the appropriate competency; and
- Consideration shall be given to any stored charges; and
- Test voltages and current do not exceed the equipment rating or test equipment rating; and
- Consideration shall be given to maintain earth between the Recipient/s and the sources of supply; and
- Consideration shall be given to the hazards of connecting and disconnecting test equipment; and
- Adequate precautions are taken for the safety of all persons during the performance of the test; and
- That the provisions of Clause 3.2.5 (in regard to the removal of an earth) are met.

### 3.3.5 **Cancellation of Electrical Access Permits**

#### 3.3.5.1 **Recipients Signing Off an Electrical Access Permit**

It shall be the duty of each Recipient of an EAP to sign off before the EAP is relinquished.

#### 3.3.5.2 **Absence of a Recipient at Relinquishment**

Signing off an EAP on behalf of another person is undesirable and should be avoided.

Appropriate organisational procedures should be implemented with instructions for signing off Recipients where the Recipients could not sign off in person.

### 3.3.6 **Declaring Electrical Apparatus Out of Commission**

An out of commission written declaration shall include a statement of the condition of the electrical apparatus including all relevant auxiliary equipment (e.g., control circuits, compressed air supplies, etc.).

### 3.4 High Voltage Live Work

This Section is not applicable to the operation, washing or testing of HV live electrical apparatus. Refer to organisational procedures.

HV live work shall only be undertaken after first considering performing the work under isolated and earthed conditions.

Before HV live work is commenced, a hazard identification and JSA shall be undertaken and the associated controls applied to confirm that the work can be performed safely.

Work on or near exposed HV live conductors shall be performed by appropriately trained and competent HV Live Workers using approved methods as detailed in the *VESI Minimum Rules for Carrying Out HV Live Work in Victoria* and organisational procedures.

### 3.5 Sanction for Testing (SFT) Procedures

#### 3.5.1 General

A SFT shall be used if the testing of HV electrical apparatus, when energised from either normal or test sources, has the potential to produce currents hazardous to the human body.

A SFT and an EAP shall not be on issue on the same electrical apparatus simultaneously.

Only one SFT shall be on issue on the same electrical apparatus at any time.

A SFT shall be issued and cancelled only by an authorised Electrical Operator.

Other appropriate provisions of Part 3 shall also apply to SFT procedures.

A SFT may be issued or relinquished by telephone or radio, subject to the statements between the Authorised Electrical Operator and the Tester in Charge being confirmed by an Authorised Recipient as a witness at each location.

#### 3.5.2 Application for Sanction for Testing

Only an Authorised Applicant shall make application for a Sanction for Testing, which application shall take into account the following mandatory considerations:

- Before making an application for Sanction for Testing the Authorised Applicant shall establish that the proposed work has been properly planned and can be carried out safely.
- The electrical apparatus to be tested and its location shall be accurately defined and the task to be undertaken adequately described in the application.
- Testing shall be undertaken in accordance with approved procedures and adequate precautions shall be taken to avoid exposure to hazardous voltages and currents.
- Only one Sanction for Testing shall be on issue on the same electrical apparatus at any time.
- Where the test is to be undertaken on electrical apparatus having involvement of more than one Operating Authority then protocols shall be established for processing the application and test requirements.

#### 3.5.3 Persons Permitted to Sign on to Sanction for Testing

Persons permitted to sign onto a Sanction for Testing shall be Authorised Testers, Authorised Electrical Operators, Authorised Recipients or Instructed Persons approved to work under that specific Sanction for Testing.

In the case of Authorised Electrical Operators, Authorised Recipients or Instructed Persons, it shall be the responsibility of the Tester In Charge or the tester responsible at remote location to

ensure that such persons are placed in the charge of an Authorised Tester, who may be the Tester in Charge.

The conditions under which an Authorised Tester shall 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 Authorised Recipient shall sign on to a Sanction for Testing are that the Authorised Electrical Operator or Recipient:

- 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 be Effectively Supervised by a nominated Authorised Tester.

The conditions under which an instructed person shall sign-on to a sanction for testing are that the person:

- Understands instructions given by the Authorised Tester regarding the limit of approach to the electrical apparatus; and
- Understands instructions given by the Authorised Tester 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 be effectively supervised by a nominated Authorised Tester.

### 3.5.4 Responsibilities of Tester in Charge

The Tester in Charge shall ensure that those members of the work party, who will be making contact or approaching within the prescribed SAD of electrical apparatus under test (including any of the test connections) shall sign on the SFT.

The Tester in Charge shall 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.

When an SFT is to be relinquished for cancellation, the Tester in Charge shall:

- Ensure that all persons signed on the SFT have ceased work covered by the SFT, have signed off and are aware that they shall remain clear.
- Ensure that all test equipment is clear and will remain clear of the electrical apparatus.
- Sign off the SFT to indicate that the SFT can be cancelled.
- Advise the Operating Authority of the condition of the electrical apparatus at all related locations.

### 3.5.5 Authorised Tester Responsible at the Remote Location

Where testing works are to be undertaken at a remote end co-ordinated under a Sanction for Test, an Authorised Tester at the remote location shall:

- Assume the same responsibilities as specified for the Tester in Charge.
- Be under direction of the Tester in Charge.
- Advise the Tester in Charge of changes to the condition of the electrical apparatus at the remote location.

## 3.6 Placing High Voltage Electrical Apparatus in Service

### 3.6.1 Clearance for Service

**Note:** This section does not apply to protection, control systems, auxiliary circuits and LV services.

#### 3.6.1.1 Clearance for like Electrical Apparatus at the Same Location

Unless otherwise required by the Operating Authority, when replacing like electrical apparatus at the same location, organisational procedures for handing over from the constructing or maintaining authority shall include verbal advice to the Operating Authority regarding the serviceability and completion of pre-activation tests.

#### 3.6.1.2 Clearance for New or Out of Commission Electrical Apparatus

Before any electrical connection is made whereby new electrical apparatus or any electrical apparatus previously out of commission can be energised by direct switching or live work procedures:

- All persons associated with the work, and any others likely to be affected shall be informed that no further work is permitted on the electrical apparatus unless:
  - Live work procedures are used; or
  - They are Recipients of an Access Authority.
- The Operating Authority shall be notified of the intention to make HV connections.
- An Operating Authority shall not consider electrical apparatus being available for service until it has been handed over from the constructing or maintaining authority by written notification or by organisational procedures.
- The appropriate notification to the Operating Authority for HV apparatus shall be by means of an Apparatus Personnel Safety and Service Clearance.

To enable the connection to be made an appropriate operational instruction shall be used.

### 3.6.2 Precautions Prior to Making Electrical Apparatus Live

Before making any HV electrical apparatus live, organisational procedures shall require that:

- In the case of new and previously out of commission apparatus, all the necessary Personnel Safety and Service Clearance forms are completed and in the possession of the Operating Authority.
- Any Access Authorities, or other documents, which have restricted the electrical apparatus to a de-energised state, have been cancelled.
- Any pre-activation tests on the electrical apparatus have been completed satisfactorily.
- All earths and/or bonders are removed.
- A visual inspection shows that to all appearance the electrical apparatus is fit for service.

# LOW VOLTAGE ELECTRICAL APPARATUS

## PART 4

### PRINCIPLE

Part 4 addresses the following Principle:

- *Safe working procedures shall be established for work on or near low voltage network assets.*

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## 4.1 Low Voltage Electrical Safety

Work on or near LV network assets, shall be performed by appropriately trained and Authorised Persons in accordance with organisational procedures including the undertaking of a JSA.

Before commencing work on or near any LV network assets, the assets shall firstly be identified as the assets associated with the work to be undertaken.

A person working on or near live or de-energised LV electrical apparatus shall wear suitable personal protective clothing and equipment as detailed in Clause 1.1.10.

Unless working in accordance with 4.2.1, a Safety Observer shall be used as detailed in Clause 1.1.12.1.

Safe connection or reconnection of an installation to a network shall be performed in accordance with the VESI Installation Supply Connection Tests & Procedures and organisational procedures.

## 4.2 Work on or near Live Low Voltage Conductors

When work is to be carried out on or near live LV network assets, approved precautions shall be taken to prevent simultaneous contact with conductors or conductive objects at different potentials.

Before working on or near live LV conductors, a JSA shall be conducted to assist in the identification and control of hazards to ensure that the work can be performed safely.

The JSA shall consider as a minimum:

- The condition of the electrical apparatus e.g., the soundness of structures, conductors and insulators.
- Proximity of other electrical conductors or objects at different potential e.g., communication equipment, public lighting equipment and other electrical apparatus. That is, potential second points of contact.
- Work environment (heat, light, weather conditions).
- Use of appropriately rated apparel and equipment.
- The use of insulated barriers mats and covers.

Each member of the work party shall ensure that they are aware of:

- The scope and requirements of the work instruction.
- The correct identification of the apparatus to be worked on.
- The work to be done by the party.
- The work method/s to be used.
- The work each individual is to perform.
- The PPE, tools and equipment required.
- Any controls recorded on the JSA and any precautions to be taken.

### 4.2.1 Persons Working Alone

Situations in which a person may work alone on live LV network assets are those where a person is:

- Testing and/or inspecting a customer's installation; or
- Engaged in metering work; or
- An Authorised Tester engaged in the testing of protection, alarm, control and metering circuits; or
- Operating LV electrical apparatus; or

- Performing a task where a Distribution Network has carried out a risk assessment and has documented procedures.

## 4.3 Low Voltage Electrical Access Permit Procedures

### 4.3.1 Application for Access to Low Voltage Electrical Apparatus

Before making application for LV access, consideration shall be given to:

- Clearly identifying the electrical apparatus to be covered and its location.
- Understanding the work to be undertaken and methodology to be employed.

For planned LV access the Authorised Applicant shall establish that the proposed work has been properly planned and can be carried out safely.

### 4.3.2 Preparation of Low Voltage Apparatus for Access

An EAP shall be issued for work on or near exposed LV conductors except for the following types of work:

- Work on protection and control systems.
- Work on station service supply auxiliary circuits.
- LV servicing and metering.
- Public lighting (other than overhead switch wire circuit works).
- When undertaking live work techniques.

Where an EAP is to be used:

- Identify the apparatus to be worked on.
- Isolate from sources of supply where practicable.
- Tag the isolation points.
- Lock or restrain isolation points where required.
- Prove de-energised, by testing.
- Bond and/or earth as close as practicable to the worksite.

Where conductors cannot be bonded, other appropriate precautions, as well as testing, shall be taken and the Authorised Person shall advise the Recipient in Charge and record the absence of bonds/earths on the Electrical Access Authority. For work under an EAP where bonders are not in place, organisational procedures shall apply.

Control measures shall be implemented to prevent inadvertent contact with adjacent live exposed conductors or conductive objects at different potentials.

Consideration shall be given to protection from other sources of supply such as motor generator sets, photo voltaic cells, lightning and induction.

### 4.3.3 Co-ordination of Low Voltage and High Voltage Access Switching Activities

Where an EAP is to be issued on HV electrical apparatus and separate switching parties are used for the HV and LV isolations, a written statement (e.g., LVEAP or LVIBS) shall be completed by the person responsible for the LV isolations and handed to the Authorised Electrical Operator.

The Authorised Electrical Operator shall either include these isolations on the EAP or state on the EAP that LV isolations are per written statement (e.g., LV EAP or LVIBS) attached.



The written statement shall be attached to the HVEAP and the two documents shall be cross-referenced.

Where the HV and LV isolations have been carried out by one person or persons belonging to the same work party, a separate written LV statement (e.g., LVEAP or LVIBS) need not be issued provided that the limit of LV access and, where applicable, the LV precautions taken are recorded on the HVEAP.

#### 4.3.4 **Issue, Receipt and Duration of Low Voltage Access Authorities**

Where access is required to both LV and HV electrical apparatus, the Operating Authority and Authorised Applicants shall arrange for either combined access to the LV and HV electrical apparatus under an EAP or separate access arrangements for the LV and HV electrical apparatus. Refer Clauses 3.3.3 and 4.3.2.

Initial earths/bonds attached to conductors shall be recorded on the Electrical Access Authority prior to issue.

Where initial earths/bonds have not been attached prior to the issue of the Access Authority, it shall be noted on the Electrical Access Authority that the work party shall follow organisational procedures.

Electrical Access Authorities issued on LV apparatus shall be issued and cancelled only by a person deemed competent to perform LV switching.

The person issuing the Access Authority shall:

- Show the electrical apparatus covered by the Electrical Access Authority.
- Describe the precautions taken.
- Describe and where practicable point out the nearest points of supply and adjacent live apparatus to all the initial Recipients.

All members of the work party who will work on or near the electrical apparatus shall sign on the Electrical Access Authority.

All Recipients have a responsibility to ensure that the condition of the apparatus, covered by the Electrical Access Authority, is such that it shall be safe for the proposed work to be undertaken.

All Recipients shall be satisfied with the precautions taken, the location of the isolation points, and the vicinity of any adjacent live electrical apparatus.

Any person involved in the issue or receipt of an Electrical Access Authority who is not satisfied with the conditions, may request to have additional precautions taken, either before the Electrical Access Authority is issued or during the currency of the work.

After the issue of an Access Authority covering LV electrical apparatus, additional earths/bonds may be applied as necessary. These additional earths/bonds at the worksite are designated as work party earths/bonds.

Work party earths/bonds are under the control of the work party and can be attached or removed by Authorised Persons during the currency of the Electrical Access Authority.

Subsequent to the issue of an Electrical Access Authority additional Recipients may sign on the Electrical Access Authority, after appropriate instruction by the Recipient in Charge or by an Authorised Recipient acting with the knowledge of the Recipient in Charge.

##### 4.3.4.1 **Persons Permitted to Sign onto Low Voltage Electrical Access Authorities**

Recipients of a LV Electrical Access Authority shall be Authorised Persons, or Instructed Persons approved to work under that specific Electrical Access Authority. In the latter case it shall be the responsibility of the Recipient in Charge to ensure that such persons are placed under the effective supervision of an Authorised Person.

#### 4.3.4.2 Temporary Cessation of Work or Absence of Recipients

Following a cessation of work or when Recipients have been temporarily absent from the worksite, upon return each Recipient shall report to the Recipient in Charge to re-confirm the conditions of the Electrical Access Authority.

#### 4.3.4.3 Change of a Low Voltage Electrical Access Authority Conditions

The isolations specified on the Electrical Access Authority shall not be changed during the currency of the Access Authority.

### 4.3.5 Cancellation of Low Voltage Access Authorities

#### 4.3.5.1 Authorised Recipients Signing Off a Low Voltage Electrical Access Authority

Before an Access Authority is relinquished, it shall be the duty of each Authorised Recipient to ensure they are clear and will remain clear of the electrical apparatus and that they have signed off.

#### 4.3.5.2 Responsibilities of the Recipient in Charge when Relinquishing a Low Voltage Access Authority for Cancellation

When an Access Authority is to be relinquished for cancellation, the Recipient in Charge shall:

- Ensure that all Authorised Recipients signed on the Access Authority have ceased work on the apparatus covered by the Access Authority and have signed off.
- Ensure that all Authorised Recipients and equipment are clear and will remain clear of the electrical apparatus.
- Confirm the removal of any work party applied bonds/earths.
- Sign off as the Recipient in Charge and relinquish the Access Authority.
- Advise the Operating Authority of any condition of the electrical apparatus which could affect its operation.
- Ensure assets are fit for service prior to cancellation of permits and restoration of supply.

#### 4.3.5.3 Absence of a Recipient at Relinquishment

Signing off an EAP on behalf of another person is undesirable and should be avoided.

Appropriate organisational procedures should be implemented with instruction for signing off Recipients where the Recipients unable to sign off in person.

# WORK BY PERSONS NOT UNDER THE CONTROL OF A DISTRIBUTION NETWORK

## PART 5

### PRINCIPLE

Part 5 addresses the following Principle:

- *The Distribution Network shall have procedures to facilitate a safe system of access, by persons not under their control.*

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## 5.1 Electrical Safety Procedures

### 5.1.1 General

A Distribution Network shall have procedures to facilitate a safe system of access by persons, not under the control of the Distribution Network, to work in the vicinity of electrical apparatus.

On receipt of notification (e.g., No Go Zone enquiry) these procedures shall be applied.

For the purposes of this section, persons not under the control of the Distribution Network are persons, companies or organisations that have no contractual obligation to the Distribution Network and are not performing work for the Distribution Network. These persons shall comply with the *Electricity Safety Act 1998* and associated Regulations.

The Distribution Network shall ensure appropriate information is provided regarding the electrical hazards.

The Distribution Network shall direct the person controlling the work that they are responsible for having a safe system of work in place to avoid the risk from electrical hazard and will ensure all persons are aware of the safe system of work.

For work by other electrical asset owners on or adjacent to Network Assets, refer to Clause 2.1.6.

### 5.1.2 Permit to Work Adjacent to Network Assets

Where the safe system of access referred to in Clause 5.1.1 is used it shall include the use of the Permit to Work Adjacent to Network Assets.

When a Permit to Work Adjacent to Network Assets is required the Distribution Network shall require a written application to be submitted.

The application shall include sufficient information to enable the Distribution Network to determine appropriate control measures to enable safe access.

The procedure for the Permit to Work Adjacent to Network Assets shall include:

- An approved issuer who is an Authorised Recipient or an Authorised Electrical Operator.
- Nominated person in charge of the work including worksite contact details.
- Control measures (precautions) undertaken by the Distribution Network.
- Instructions given to the nominated person in charge of the work.
- A process for the issue and cancellation.

### 5.1.3 Work on Abandoned Underground Cables

Abandoned assets of an electrical network are deemed unserviceable and will not be returned to service.

In some instances, abandoned assets may not be recorded on the Distribution Networks asset database.

For work by persons (not under the control of the Distribution Network) on abandoned electrical assets, the use of a safe system of access shall be provided by the Distribution Network in accordance with organisational procedures.

### 5.1.4 Vegetation Management Adjacent to Network Assets

Persons carrying out vegetation management activities shall comply with the No Go Zone Rules. The only exceptions shall be organisations operating under standards established by Energy Safe Victoria and in accordance with Distribution Network Access procedures.

### 5.1.5 Work on Customer Assets Connected to Network Assets

A Distribution Network shall have a process to facilitate access to customer owned assets that are reliant on isolation by the Distribution Network.

#### 5.1.5.1 Procedure for Isolation of a Customer's Low Voltage Supply (SILV)

A Statement of Isolation LV (SILV) shall only be issued to the customer by an Authorised Recipient or an Authorised Electrical Operator when isolation of a customer's electricity supply is reliant on a Distribution Networks' assets; that is:

- Pole mounted isolators/fuses; or
- Any isolation point within a substation enclosure or switch/fuse cubicle, or
- Where the customer LV isolation is reliant upon HV switching of the Distribution Network.

The SILV states the condition of isolation of the customer's LV supply from the Distribution Network assets and does not by itself authorise work on the customer's electrical apparatus.

The conditions of isolation and any applied earthing/bonding shall remain unchanged until the statement is cancelled.

The SILV shall where practicable detail all relevant precautions taken for the safety of the work party/ies.

The SILV process shall include:

- The customer's request for isolation of supply.
- Indication from the customer of the works to be undertaken.
- The formal issue of a SILV to the customer's nominated representative.
- The formal cancellation of the SILV by the customer's nominated representative.
- Completion of any other documentation to enable energisation of supply.

The SILV shall include a section for the customer to notify the Distribution Network that it is safe to restore supply at the completion of works and shall also have reference to any other formal documentation e.g., Certificate of Electrical Safety (CES) as per the Electricity Safety Act and Regulations.

#### 5.1.5.2 High Voltage Customer Supply Isolations

Isolations of HV customer supplies are covered by the SCAP process, refer Clause 3.3.3.5.