

Electrical Safety Rules for Vegetation Management Work Near Overhead Powerlines by Non-Electrical Workers

Date of Issue: 1 Sept 2013		ESV: Electrical Infrastructure
Version 1.0	Document # Trim ref	Page 1 of 20

Warning: The most up-to-date version is located on the ESV Website. Printed copies of this document MAY NOT BE THE LATEST.

1. SCOPE AND PURPOSE

These electrical safety rules establish the minimum standards to be used, in addition to other occupational safety and health requirements, to enable safe vegetation management work in the *vicinity* of or *near live overhead powerlines* by persons not working for or under the control of an *electricity asset owner*, but working for an *other responsible person* who is required by the Electricity Safety (Electric Line Clearance) Regulations to have an electric line clearance management plan annually prepared before 31 March in each year.

The *other responsible person* shall ensure safe systems of work and appropriate training are in place to enable *vegetation management workers* to apply these rules.

Vegetation management workers shall apply these rules when carrying out *vegetation management work* near overhead powerlines. Workers shall only undertake work for which they have been trained, assessed and deemed competent to enable them to safely perform the work.

A trainee who is in the process of gaining the Certificate II in ESI –Powerline Vegetation Control qualification, whilst performing vegetation management works, shall be provided with effective supervision by a *Vegetation management worker*.

These rules prescribe:

- (a) *safe approach distances* and *vegetation clearances* for the safety of *vegetation management workers* and the general public; and
- (b) *safe approach distances* and *vegetation clearances* for the use of mobile plant, tools and equipment used in vegetation management work; and
- (c) guidance for development of work procedures, related training and awareness programs.

These electrical safety rules are based on the following principles:

- (a) *Safe approach distances* of personnel and plant/equipment shall not be compromised; and
- (b) Use of appropriate work methods for clearing vegetation; and
- (b) Use of appropriate tools, plant and equipment; and
- (d) workers skills and competencies shall be appropriate for the work.

Date of Issue: 1 Sept 2013		ESV: Electrical Infrastructure
Version 1.0	Document # Trim ref	Page 2 of 20

Warning: The most up-to-date version is located on the ESV Website. Printed copies of this document MAY NOT BE THE LATEST.

These electrical safety rules do **not** apply to *vegetation management work*:

- by a person who has **not** completed a training course *approved* by Energy Safe Victoria and is therefore required to comply with Division 2, Part 3 of the Electricity Safety (Installations) Regulations 2009; or
- by persons directly engaged by the *electricity asset owner*; or
- in the vicinity of *electrical apparatus* supported by a tower structure (transmission lines). *Written* permission from the owner of the tower structure shall be obtained prior to carrying out such work.

2 DEFINITION

This section gives a list of words and terms and their definitions as used in this document.

Each defined word or term has its definition set alongside. When the defined word or term is shown in italics in the text of the document, it has the defined meaning. Where a defined word or term is not printed in italics in the body of the text, it must be interpreted as the context of the text indicates or requires.

‘Access Authority’ means any form of authorisation issued by an electricity asset owner, which allows access to, or work near, electrical apparatus.

‘Approved’ means having appropriate organisation endorsement in writing for a specific function.

‘Agreed process’, for the purpose of Clauses 4.1 and 4.4, means a process *approved* by both the *other responsible person* and the relevant electricity asset owner, taking into account the following safety principles:

- Safety must not be compromised; and
- Effective communication of requirements in clauses 4.1 and 4.4; and
- Compliance with other applicable safety laws and requirements.

‘Bare’ means, in relation to a *conductor*, not insulated.

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

‘Climber’ means a *vegetation management worker* who carries out *vegetation management work* while the worker is supported by that vegetation.

‘Conductor’ means a wire, or form of metal designed for carrying electric current.

‘Competent’ means having the skills, knowledge and attributes a person needs to safely complete a task.

Date of Issue: 1 Sept 2013		ESV: Electrical Infrastructure
Version 1.0	Document # Trim ref	Page 3 of 20

Warning: The most up-to-date version is located on the ESV Website. Printed copies of this document MAY NOT BE THE LATEST.

‘Covered low voltage conductor’ means a low voltage conductor that is covered for environmental, mechanical or visual purposes but is not considered to be insulated.

‘De-energised’ means not connected to any source of electrical supply but not necessarily isolated.

‘Earthed’ means directly electrically connected to the general mass of earth, so as to ensure and maintain the effective dissipation of electrical energy.

‘Electrical apparatus’ means any electrical equipment, including *overhead powerlines* and underground *cables*, the *conductors* of which are live or can be made live.

‘Electricity asset owner’ means the owner, controller or operator of an *electrical apparatus* or electricity supply network.

‘Elevating work platform or EWP’ means a vehicle on which a boom type mechanism, either articulating or telescoping, is installed. The mechanism is designed and used for the positioning of personnel at work sites or for positioning both personnel and equipment at work sites.

‘Energised’ means connected to a source of electrical supply.

‘ESV’ means Energy Safe Victoria.

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

‘Ground worker’ means a *vegetation management worker* that carries out *vegetation management work* from the ground.

‘High voltage’ or ‘HV’ means a nominal *voltage* exceeding 1,000V AC or exceeding 1,500V DC.

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

‘Insulated elevating work platform or insulated EWP’ means an elevating work platform that complies with the design and electrical testing requirements of AS 1418.10.

‘Insulated plant, tools and equipment’ means plant, tools and equipment specifically designed, *approved*, *tested* and maintained for use on or near live electrical apparatus. They shall be used only on or near electrical apparatus,

Date of Issue: 1 Sept 2013		ESV: Electrical Infrastructure
Version 1.0	Document # Trim ref	Page 4 of 20

Warning: The most up-to-date version is located on the ESV Website. Printed copies of this document MAY NOT BE THE LATEST.

which is energised at a *voltage* equal to or less than the *voltage* rating nominated by the manufacturer of the plant, tool or equipment.

‘Isolated’ means disconnected from all possible connection sources of electricity supply by means which will prevent unintentional energisation of the apparatus and which is assessed as a suitable step in the process of making safe for access purposes.

‘Live’ means energised or subject to hazardous induced or capacitive *voltages*.

‘Low voltage’ or ‘LV’ means nominal *voltage* exceeding 50V AC or 120V DC but not exceeding 1000V AC or 1500V DC.

‘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.

‘Near’ means a situation where there is a reasonable possibility of a person, mobile plant or equipment (other than *approved* insulated tools and equipment) either directly or through any conducting medium, coming within the relevant safe approach distances.

‘Non-conducting rope’ means standard commercial grade synthetic rope, made from a material, which is known to have electrical insulating properties, but is not electrically *tested*.

‘Other responsible person’ (ORP) means an entity responsible for the work related to *vegetation management work* under subsections 84(4) and 84(6) of the Electricity Safety Act 1998 (e.g. municipal councils).

‘Overhead electric line’ means any aerial *conductor* or *conductors* with associated supports, insulators and other apparatus erected, or in the course of erection, for the purpose of the conveyance of electrical energy. Note: For the purposes of this document, “*overhead electric line*” does not include any pole or similar support when determining the *safe approach distance* from *live conductors*.

‘Powerline’ means an *overhead* electric line with a nominal *Voltage* of 66kV or less.

‘Personal protective equipment’ 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.

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

‘Safe’ means not posing an unacceptable risk to life, health or property.

Date of Issue: 1 Sept 2013		ESV: Electrical Infrastructure
Version 1.0	Document # Trim ref	Page 5 of 20

Warning: The most up-to-date version is located on the ESV Website. Printed copies of this document MAY NOT BE THE LATEST.

‘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*.

‘Safety observer’ means a person with sufficient knowledge of the task being performed and competent for the duty of observing and warning of any unsafe approach to *electrical apparatus*.

‘Scheduled vegetation management work’ means *vegetation management work* programmed to be carried under an electric line clearance management plan that has been prepared in accordance with the Electricity Safety (Electric Line Clearance) Regulations.

‘Service provider’ is a person or an entity that is engaged by *other responsible person* to undertake vegetation management work.

‘Shall’ – is to be interpreted as “mandatory”.

‘Should’ – is to be interpreted as “advisory or discretionary”.

‘Tested’ – means tested in accordance with the relevant standards.

‘Urgent vegetation management work’ means *vegetation management work* in responding to an unforeseeable event which requires the pruning, cutting, trimming or felling of a specific *vegetation*, to avoid imminent danger to the public or the electricity supply network.

‘Vegetation’ means any living or non-living flora or any part of that flora.

‘Vegetation clearance’ means the minimum separation in air that shall be maintained between vegetation and live *electrical apparatus* when performing vegetation management work.

‘Vegetation management work’ means the pruning, cutting, trimming or felling of, or application of herbicides to, vegetation and assisting to prune, cut, trim or fell, or apply herbicides to, vegetation, where:

- any part of the vegetation being pruned or cleared may come within 2 metres of live *overhead powerlines*, or
- the work requires any person, tool, equipment or vehicle to come closer to live *overhead powerlines* than the following relevant minimum distances:
 - a) 100 mm for insulated low voltage conductors
 - b) 1500 mm for *bare* or covered low voltage conductors
 - c) 2000 mm for high voltage conductor with a nominal voltage not exceeding 66kV.

Date of Issue: 1 Sept 2013		ESV: Electrical Infrastructure
Version 1.0	Document # Trim ref	Page 6 of 20

Warning: The most up-to-date version is located on the ESV Website. Printed copies of this document MAY NOT BE THE LATEST.

‘Vegetation management worker’ means a person:

- whose qualifications, experience and training and assessment ensure competency in the performance of *vegetation management work*; and
- who has completed a training course *approved* by ESV; and
- who has technical knowledge or sufficient experience to perform the duty concerned; and
- who has been endorsed in writing by an organisation (e.g. the employer) to perform the work.

‘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*.

‘Voltage’ means a difference of electrical potential normally existing between *conductors* or between *conductors* and earth.

3 GENERAL PRINCIPLES

These electrical safety rules should be applied in the context of the following prerequisites:

- (a) *Other responsible persons* and *service providers* have in place an effective risk management process, as part of a systematic approach to managing safety, including the necessary organisational structures, accountabilities, policies and procedures.
- (b) Appropriate workplace hazard and risk assessments are carried out prior to the commencement of work.
- (c) The *safe approach distances* used are appropriate for the class of person and work to be performed.
- (d) The safe approach distances in these electrical safety rules are based on an “exclusion zone” principle. This principle defines an area near the *electrical apparatus* into which no part of the person, mobile plant, tools and equipment may encroach taking into account the possibility of inadvertent movement of the person or platform.
- (e) An effective process is in place to monitor and audit the compliance against these rules and documented safe work procedures for *vegetation management work*.
- (f) When pruning vegetation near live *overhead powerlines*, arboriculture techniques should be used where practicable, in accordance with the appropriate Australian Standard.

Date of Issue: 1 Sept 2013		ESV: Electrical Infrastructure
Version 1.0	Document # Trim ref	Page 7 of 20

Warning: The most up-to-date version is located on the ESV Website. Printed copies of this document MAY NOT BE THE LATEST.

4. NOTIFICATION OF WORK

4.1 *Scheduled Vegetation Management Work near Low Voltage Overhead Conductors*

For the purpose of notification of *scheduled vegetation management work* near *low voltage* overhead conductors, an *agreed process* between the *other responsible person* and the relevant *electricity asset owner* can be established to comply with regulation 319(2) of the Electricity Safety (Installations) Regulations 2009.

4.2 *Scheduled Vegetation Management Work near High Voltage Overhead Conductors*

For *scheduled vegetation management work near high voltage overhead conductors*, a notification shall be lodged with the *electricity asset owner* in the form required by the *electricity asset owner* at least 10 business days prior to the proposed date of work. Further discussion with the *electricity asset owner* may be required and may result in variation to scheduled work including times.

4.3 Submission of Notification

Before making a notification, the *other responsible person* or their engaged *service providers* shall establish that the proposed work has been properly planned and can be carried out safely and shall consider:

- work method to be utilised; and
- type of electricity assets, and
- equipment required; and
- work environment; and
- current competence of the work party.

On making a notification the following information should be given:

- the electrical assets and location shall be accurately defined. Appropriate diagrams and/or maps shall be used to show the work area in relation to electrical assets; and
- the work method and mobile plant to be used; and
- the intended or proposed date and times of the works; and
- contact details of the person on site on the day of the works.

Date of Issue: 1 Sept 2013		ESV: Electrical Infrastructure
Version 1.0	Document # Trim ref	Page 8 of 20

Warning: The most up-to-date version is located on the ESV Website. Printed copies of this document MAY NOT BE THE LATEST.

This information should be used to determine the circuits involved and the ability to apply the applicable network protection or configuration required.

The *electricity asset owner* shall respond to the notification at least 3 business days prior to the commencement date of the work specified in the submitted notification.

Work may not proceed until confirmation has been received from the *electricity asset owner*.

Contact information of *electricity asset owners* are as below:

Company	Phone	email
Citipower or Powercor (Vemco)	(03) 5338 3300	
Jemena		orp.notification@jemena.com.au
SP AusNet	(03) 9237 4408	
United Energy	(03) 8846 9900	

If contact information changes it shall be the responsibility of the *electricity asset owner* to notify *other responsible persons* and ESV revised contact information at the earliest opportunity.

4.4 Urgent Vegetation Management Work near High Voltage Overhead Conductors

Notification for *urgent vegetation management works* shall be undertaken in accordance with the *agreed process* or procedure established between the *other responsible person* and the *electricity asset owner*.

5. GENERAL SAFETY REQUIREMENTS

No *vegetation management work* shall be performed if other work could compromise the safety of the *vegetation management work* team.

Extreme care shall be taken when using uninsulated tools, equipment or plant in the vicinity of electric lines, with particular attention to ensure the clearances listed in Tables 1 & 2 are not encroached.

If *vegetation management work* causes any damage or outage to a network the *ORP* shall advise *ESV* and the *electricity asset owner* through an incident reporting process.

5.1. Hazard identification and risk assessment

Prior to commencing *Vegetation management work* near live overhead power lines, a documented hazard identification and risk management process shall be undertaken to identify and address hazards associated with the work to be completed, work site conditions, environmental conditions, the use of materials, mobile plant, tools and equipment. Such a process shall:

- (a) Identify the hazard; and
- (b) Assess the risk; and
- (c) Determine control measures; and
- (d) Monitor and review the effectiveness of the control measures during the work activity.

5.1.1. Hazards

Hazards that may be encountered include but are not limited to:

- (a) Unexpected movement of the worker, mobile plant or the vegetation relative to the electrical apparatus.
- (b) Unexpected lateral movement (sway) of the *conductors* due to wind, particularly in gusty conditions.
- (c) Unexpected drop in height (sag) of the *conductors* due to temperature rise associated with changes in electrical load, solar radiation or reduced cooling under light or still wind.
- (d) Supply network fault conditions may create extreme movement of *conductors* and poles.

Date of Issue: 1 Sept 2013		ESV: Electrical Infrastructure
Version 1.0	Document # Trim ref	Page 10 of 20

Warning: The most up-to-date version is located on the [ESV Website](#). Printed copies of this document MAY NOT BE THE LATEST.

- (e) The integrity of the adjacent structures, *conductor* and of any insulation on *live conductors*.
- (f) Site conditions (stability of equipment and footing), vehicular traffic, pedestrians, or livestock management (interference with the work).
- (g) Direct or indirect contact with live overhead *powerlines* via vegetation or tools and equipment.
- (h) Hazardous *voltages* that may be present in all parts of the work area including the base of vegetation where any part of the vegetation is in contact with live overhead *powerlines*, particularly during wet and/or windy conditions.

5.1.2 Controlling hazardous situations

A hierarchy of control shall be used when considering appropriate hazard control measures. These measures shall include the use of appropriately trained persons to control risks from hazardous situations in accordance with written procedures *approved by other responsible persons* or *Service providers*. This may be achieved by but is not limited to one or more of the following methods:

- (a) Making applications to the *electricity asset owner* to have the *electrical apparatus* isolated and earthed (made safe)
- (b) The use of *approved* live work procedures (e.g. insulated mobile plant, tools and equipment)
- (c) Provision of a suitably trained safety observer
- (d) Increasing the minimum *safe approach distances* required to safely carry out the *Vegetation management work* including allowance for unexpected *conductor* movement
- (e) The use of suitable personal protective equipment
- (f) Defining and establishing drop zones
- (g) The suppression of auto-reclose functionality on electrical protection equipment

When performing *vegetation management work*, *vegetation management workers* shall control tools and equipment in such a manner as to maintain the appropriate *safe approach distances at all times*.

Only synthetic ropes shall be used for vegetation work. Synthetic rope is considered to be non-conducting, but is not electrically *tested* and has no guaranteed insulating properties. Non-conducting rope shall be kept away from live components, by a distance at least equal to the applicable safe approach distances in Tables 1&2.

Date of Issue: 1 Sept 2013		ESV: Electrical Infrastructure
Version 1.0	Document # Trim ref	Page 11 of 20

Warning: The most up-to-date version is located on the ESV Website. Printed copies of this document MAY NOT BE THE LATEST.

All ropes should be kept clean and clear of deteriorating contaminants such as hand creams, sunscreens, paint solvents, hydraulic oil, fuels, etc. which may affect or cause deterioration of the insulating qualities of equipment. Contaminated ropes should be discarded.

5.1.3 Insulated tools and equipment

All *insulated* tools and *insulated* equipment used for the purpose of *vegetation management work* shall be electrically tested at intervals not exceeding six months. The appropriate electrical insulation test shall be carried out in accordance with the manufacture specifications or other appropriate industry standard.

All insulated tools and equipment should be maintained in a clean and dry condition.

Insulated tools and equipment should not be laid directly on the ground.

Insulated tools and equipment shall be stored and transported in a way that shall ensure the equipment is not exposed to excess moisture, dust, abrasion and other deteriorating effects.

Insulated tools and equipment shall be visually inspected and cleaned before use.

Any tool that appears to be defective shall be labelled defective, and quarantined from service for further inspection, testing, repair or replacement.

All insulating tools and equipment should be kept clear of deteriorating contaminants such as hand creams, sunscreens, paint solvents, hydraulic oil, fuels, etc. which may affect or cause deterioration of the insulating qualities of equipment.

5.1.4 Weather conditions

Vegetation management work near live overhead powerlines shall not proceed in the event of the following conditions:

- (a) an electrical storm is observed in the *vicinity* of the worksite; or

Date of Issue: 1 Sept 2013	ESV: Electrical Infrastructure
Version 1.0	Document # Trim ref Page 12 of 20

Warning: The most up-to-date version is located on the ESV Website. Printed copies of this document MAY NOT BE THE LATEST.

- (b) excessive wind velocities such that work cannot be carried out safely due to the potential for unexpected movement of *conductors*, plant or vegetation sufficient to breach *safe approach distances*; or
- (c) wet working condition which may reduce the level of insulation of tools and equipment; or
- (d) visibility is not adequate.

5.2. **Personal protective equipment**

All persons who undertake *Vegetation management work near overhead powerlines* shall use *approved* personal protective equipment.

Personal protective equipment shall include clothing with wrist to ankle cover and fully enclosed footwear. Additional *personal protective equipment* should be used in accordance with the type of work and the risks involved.

The following minimum *personal protective equipment* shall be worn and shall comply with the relevant Australian Standards:

- (a) clothing: natural fibre or alternative arc flash protective materials;
- (b) safety helmet;
- (c) protective safety footwear with non-slip soles;
- (d) safety eye protection;
- (e) hearing protection, as required by the nature of the work being performed;
- (f) working gloves as required by the nature of the task being performed;
- (g) fall protection/prevention equipment for working at height.

5.3 **Wearing of metallic objects (personal jewellery)**

Metallic objects such as neck chains, earrings and other body adornments, rings, watches and bracelets shall be removed or covered while carrying out *Vegetation management work near live overhead powerlines*. In the event of an arc flash, metallic objects may increase the level of injury sustained by the person.

5.4 **Long hair**

Long hair, including facial hair should be securely fixed and confined close to the head.

Date of Issue: 1 Sept 2013		ESV: Electrical Infrastructure
Version 1.0	Document # Trim ref	Page 13 of 20

Warning: The most up-to-date version is located on the ESV Website. Printed copies of this document MAY NOT BE THE LATEST.

5.5. Appointment of a safety observer

A safety observer(s) shall be appointed where any part of a person, mobile plant or vegetation could come within the safe approach distances. Depending on the position and complexity of the work, more than one safety observer may be required, however at least one safety observer must be positioned at ground level.

The safety observer(s) shall not perform any other task while acting as a safety observer and shall:

- (a) be specifically instructed in the workplace hazards applicable; and
- (b) ensure that all persons, tools, plant and equipment remain outside the specified minimum safe approach distance unless performing a rescue in accordance with *approved* procedures; and
- (c) be positioned at a suitable location to effectively observe the work being performed; and
- (d) not observe more than one *vegetation management work* activity at any time; and
- (e) have the authority to suspend the activity at any time; and
- (f) maintain effective and immediate communication with the work team at all times; and
- (g) not pass tools directly to the person performing the work; and
- (h) suspend all work in the event of having to leave the site or significantly change position until he/she has returned/reached new location or has been replaced; and
- (i) be trained and assessed competent to perform rescue relevant to the work being undertaken and any plant being operated, and
- (j) not be subjected to distractions by other persons at the site.

The safety observer's role may be rotated between members of the work team, for example to reduce fatigue. When this occurs it shall be sufficiently communicated so that all members of the work party are aware at all times who is performing the role of the safety observer(s).

5.6 Mobile plant

Only *insulated mobile plant (insulated elevating work platforms)* shall be used when working in accordance with this document.

Date of Issue: 1 Sept 2013		ESV: Electrical Infrastructure
Version 1.0	Document # Trim ref	Page 14 of 20

Warning: The most up-to-date version is located on the ESV Website. Printed copies of this document MAY NOT BE THE LATEST.

Uninsulated *mobile plant* (uninsulated *elevating work platforms*) must comply with No Go Zone Rules. No Go Zone rules are available at:

ESV <http://www.esv.vic.gov.au/For-Consumers/No-Go-Zones>

Worksafe <http://www.worksafe.vic.gov.au/safety-and-prevention>

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 should include:

- positioning the mobile plant such that it minimises the potential for encroaching into the *safe approach distances* area; and
- the use of safety observers; and
- the use of other precautions such as physical restrictions, on-site markers setting boundary of plant operating area or control devices in conjunction with barriers.

Other precautions related to the condition of the *electrical apparatus* shall be discussed and agreed with the *electricity asset owner*.

Mobile plant, and where appropriate, vehicles, shall be fitted with an *approved* earthing device that will protect against the hazards presented by induced *voltages* or accidental contact with *Live apparatus*. This may be:

- an earth chain not less than 13mm diameter and allowing for 1 metre length on the ground when the vehicle is raised off the ground; or
- a temporary driven earth stake that is bonded to the chassis of the vehicle.

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

No person other than the *mobile plant* operator shall touch the mobile plant while in operation *near live electrical apparatus* unless it is necessary for the purpose of an emergency situation (refer section 7).

During operation of the mobile plant near *live conductors* and/or *electrical apparatus*, only those persons at ground level actually involved in the work associated with the mobile plant may be near the plant; all other persons *should* stay at least 6 metres away from the mobile plant.

A person on the ground shall be provided to enable the rescue of the person/s working aloft. This person needs to:

Date of Issue: 1 Sept 2013		ESV: Electrical Infrastructure
Version 1.0	Document # Trim ref	Page 15 of 20

Warning: The most up-to-date version is located on the ESV Website. Printed copies of this document MAY NOT BE THE LATEST.

- understand how to lower the mobile plant in an emergency situation where the operator becomes incapacitated; and
- understand the risks and hazards that may be applicable following an incident.

Training of operators of mobile plant shall include description of the hazards of movement of *mobile plant* in proximity to live *electrical apparatus* and detail precautionary measures which may be taken to ensure safe working conditions.

Inspection of the insulated sections of the mobile plant shall occur on a daily basis, before use.

5.7 Mobile Plant – Testing

Insulated mobile plant used for access to vegetation *near* powerlines shall have a current electrical test certificate.

Each EWP used in the vicinity of *electrical apparatus* shall be subjected to an *approved* HV electrical test on its insulated section/s at intervals not exceeding six months or more frequently depending on usage and work environment.

The mobile plant shall not be accepted as suitable for use in the vicinity of live *electrical apparatus* unless it is within test date. (Refer to AS/NZS1418:10)

Mobile plant should also have weight tests carried out in accordance with the relevant Australian Standards and the manufacturer's or industry requirements.

6 VEGETATION MANAGEMENT WORK

Tree limbs shall be considered as conductive objects when within the *safe approach distances* of HV *conductors*.

Before undertaking *vegetation management work*, a risk assessment shall be conducted to assist in the identification and control of hazards to ensure that the work can be performed safely.

Issues to be considered prior to commencing work:

- tree climbing techniques shall only be used when other *approved* mechanical methods for accessing trees are impracticable.

Date of Issue: 1 Sept 2013		ESV: Electrical Infrastructure
Version 1.0	Document # Trim ref	Page 16 of 20

Warning: The most up-to-date version is located on the ESV Website. Printed copies of this document MAY NOT BE THE LATEST.

- positioning the mobile plant such that the safe approach distance can be maintained in all circumstances; and
- the use of safety observers; and
- consideration of weather and environmental conditions (e.g. rain, wind, light, sag or sway of *conductors*); and
- movement of the tree when cut.

When performing *vegetation management work*, *vegetation management workers* shall observe appropriate *safe approach distances* outlined in tables 1 and 2 below. Means of controlling the movement of limbs being cut should be assessed and action taken as appropriate.

Vegetation overhanging LV *conductors* can be cut with the *conductors* live provided the movement of limbs being cut can be controlled. (Refer to Note 1 in tables 1 and 2)

Vegetation overhanging and/or contacting HV *conductors* shall only be cut by persons who are specifically trained and authorised for such work in accordance with the *electricity asset owner's* requirements.

7 EMERGENCY SITUATIONS

Other responsible persons and *Service providers* shall have in place documented procedures for response to electrical emergency situations.

In emergency situations where there is a likely risk of an electric shock and burns 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. For fallen or exposed electrical *conductors* a safety clearance of 6 metres shall apply.

Where plant and equipment and conductive objects/trees are in contact, or within safe approach distances of *electrical apparatus* no attempt should be made to:

- (1) perform a rescue of an injured person(s); or
- (2) approach *electrical apparatus* or electrically conductive objects,

until an authorised representative from the *electricity asset owner* has confirmed as a minimum that the *conductors* are de energised with the preference being that the *conductors* are isolated and earthed (i.e. 'made safe'). The actions to be taken should take into account external factors (response time, event location, level of emergency and available information).

Date of Issue: 1 Sept 2013		ESV: Electrical Infrastructure
Version 1.0	Document # Trim ref	Page 17 of 20

Warning: The most up-to-date version is located on the ESV Website. Printed copies of this document MAY NOT BE THE LATEST.

Where practicable:

- a worker is to remain on site to issue verbal warnings to any person making unsafe approach to fallen or exposed electrical *conductors* or
- access to the site must be controlled by the use of barriers or signs, e.g. rope, ribbon, portable flashing lamps, or traffic control devices i.e. witches hats/bollards.

Date of Issue: 1 Sept 2013		ESV: Electrical Infrastructure
Version 1.0	Document # Trim ref	Page 18 of 20

Warning: The most up-to-date version is located on the ESV Website. Printed copies of this document MAY NOT BE THE LATEST.

Table 1: Safe Approach Distances (mm) for Vegetation Management Work Near OH lines when working from an insulated EWP

	Insulated LV	Bare or covered LV			HV up to and including 22kV			Greater than 22kV up to and including 66kV		
	All directions	Under conductor	Beside conductor	Over conductor	Under conductor	Beside conductor	Over conductor	Under conductor	Beside conductor	Over conductor
Worker's Body Clearance	No Contact	300	300	300	1000	1000	Work not permitted	2000	2000	Work not permitted
Uninsulated tool/Equipment	200	300	300	300	1000	1000	Work not permitted	2000	2000	Work not permitted
Insulated tool & Equipment	200	300	300	300	1000	1000	Work not permitted	2000	2000	Work not permitted
Uninsulated Part of EWP	200	1000	1000	1000	2000	2000	Work not permitted	3000	3000	Work not permitted
Insulated Part of EWP	No Contact	No Contact	No Contact	No Contact	1000	1000	Work not permitted	2000	2000	Work not permitted
Vegetation Clearances	No clearance required ⁴	No clearance required ⁴	No clearance required ⁴	1000 ¹	300	700	Work not permitted	400	900	Work not permitted

NOTE:

1. Vegetation which is located at least 1000mm above *bare* LV conductor can be cleared subject to the following conditions: **(a)** A risk assessment is carried out with appropriate control measure put in place and; **(b)** Effective control measures are used to prevent the cut vegetation from contacting the conductor or encroaching into the vegetation clearance space. **(c)** a safety observer is posted.
2. *Conductor* sag and sway exclusion: The *safe approach distances* and *vegetation clearances* detailed in the Electrical Safety Rules make no provision for *conductor* movement due to wind or change in *conductor* temperature. Unexpected *conductor* movement may occur under moderate wind, network faults or changes in *conductor* heating or cooling factors. *Conductor* movement of several metres may result in long span/s of electric lines. Appropriate allowance for sway and sag changes must be applied in accordance with advice sought from the *electrical asset owner*.
3. Where the *safe approach distances* cannot be maintained, an *access authority* must be obtained from the owner of the electrical asset.
4. Vegetation contacting live LV *conductors* may be cut only after a risk assessment has been performed and precautionary actions are taken to control hazards to ensure that the work can be performed safely

Table 2: Safe Approach Distances (mm) for Vegetation Management Work by *Ground Worker* and *Climber* working near Overhead Powerlines

	Insulated LV	Bare or covered LV			HV up to and including 22kV			Greater than 22kV up to and including 66kV		
	All directions	Under conductor	Beside conductor	Over conductor	Under conductor	Beside conductor	Over conductor	Under conductor	Beside conductor	Over conductor
Worker's Body Clearance	200	1000	1000	Work not permitted	1200	1200	Work not permitted	2000	2000	Work not permitted
Uninsulated tool/Equipment	200	1000	1000	Work not permitted	1000	1000	Work not permitted	2000	2000	Work not permitted
Insulated tool & Equipment	200	300	300	Work not permitted	1000	1000	Work not permitted	2000	2000	Work not permitted
Vegetation Clearances	No clearance required ⁴	No clearance required ⁴	No clearance required ⁴	3000 ¹	700	700	Work not permitted	900	900	Work not permitted

NOTE

1. Vegetation which is located at least 3000mm above *bare* LV conductor, can be cleared subject to the following conditions: **(a)** A risk assessment is carried out with appropriate control measure put in place and; **(b)** Effective control measures are used to prevent the cut vegetation from contacting the conductor or encroaching into the vegetation clearance space **(c)** a safety observer is posted.
2. *Conductor* sag and sway exclusion: The *safe approach distances* and *vegetation clearances* detailed in the Electrical Safety Rules make no provision for *conductor* movement due to wind or change in *conductor* temperature. Unexpected *conductor* movement may occur under moderate wind, network faults or changes in *conductor* heating or cooling factors. *Conductor* movement of several metres may result in long span/s of electric lines. Appropriate allowance for sway and sag changes must be applied in accordance with advice sought from the *electrical asset owner*.
3. Where the *safe approach distances* cannot be maintained, an *access authority* must be obtained from the owner of the electrical asset.
4. Vegetation contacting live LV *conductors* may be cut only after a risk assessment has been performed and precautionary actions are taken to control hazards to ensure that the work can be performed safely