



WPS058

Safe Management of Vegetation near Live Overhead Powerlines



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CONTENTS

1	Purpose	3
2	Scope	3
	2.1 This work practice covers	3
	2.2 Does not cover	3
3	Work Practice	3
	3.1 General Principles	3
	3.2 Hazard Identification and Risk Assessment	4
	3.3 Personal Protective Clothing and Equipment	5
	3.4 Safety Observer	6
	3.5 Safe Approach Distances and Vegetation Clearances	6
	3.6 Safe Approach Distances for Persons, Plant and Vegetation	8
	3.7 Competency and Authorisation	13
	3.8 Tools and Equipment	13
	3.9 Cranes and Elevated Work Platforms (EWPs)	15
	3.10 Work Considerations	15
	3.11 Process in the Event of an Incident	16
4	Definitions	17
5	Change Management and Continuous Improvement	20
	5.1 Consultation, Approval and Communication	20
	5.2 Review	21
	5.3 Internal References and Related Documents	21
	5.4 External References, Legislative and Regulatory Obligations	21
	5.5 Records Management	21
	5.6 Improvement Suggestions	21
	5.7 Document History	22
6	Appendices	23

1 Purpose

The purpose of this Work Practice is to outline the minimum requirements Power Services has adopted for employees, contractors and the public, for the safe management of vegetation in the vicinity of live overhead powerlines owned and operated by Power and Water.

This work practice intends to:

- Ensure the safety of vegetation management workers and the general public
- Specify the minimum standards required for mobile plant, tools and equipment used in vegetation management work
- Be a practical guide to achieving the standards of health, safety and welfare required under the relevant NT Legislative Acts and Regulations and Power and Water safety management systems

2 Scope

This Work Practice applies to the treatment and removal of vegetation in the vicinity of Power and Water owned existing electricity supply infrastructure.

This work practice sets out the process for the management of vegetation in the vicinity of overhead powerlines.

Vegetation management work covered by this work practice is not considered electrical work

2.1 This work practice covers

- The boundaries between the network operator and the land owner for the management of vegetation near overhead powerlines
- Minimum vegetation clearances required around overhead powerlines
- Minimum Safe Approach Distances (SAD) for vegetation workers
- The SAD when using insulated and uninsulated tools, plant and equipment
- Qualification and authorisation requirements for Vegetation management workers

2.2 Does not cover

- Privately owned lines
- The portion of services more than two metres beyond the property boundary
- It does not apply to the treatment and removal of vegetation in the vicinity of powerlines under construction

3 Work Practice

3.1 General Principles

This work practice should be applied in the context that:

- a) Power and Water has in place an effective risk management process, as part of a safety management system. (Control0068)
- b) Workplace hazard and risk assessments are carried out. (BDOC2014/252)
- c) Safe Approach Distances used are appropriate for the level of authorisation for persons, training and working in the vicinity of overhead powerlines. (ENA NENS 04)

- d) The Safe Approach Distances in this work practice is 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 & equipment (other than approved insulated tools & equipment) may encroach.
- e) An effective process is in place to regularly undertake the field audits of vegetation management work near live overhead lines. This field audit shall address safe work practices and compliance with documented techniques at intervals based on the findings of prior audits.
- f) The requirements of the (ESAA NENS 02-2001) publication National Electricity Network Operator and Service Provider Safety Assurance Procedures are complied with.
- g) This work practice may be equally applicable the underground network and zone substations, when combined with appropriate training and work controls.

3.2 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 in place to address hazards associated with work practices, the work environment, the use of materials, plant, tools and equipment.

The process shall:

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

3.2.1 Hazards

A 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) The integrity of the adjacent structures, conductor spans and of any insulation on live conductors.
- e) Site conditions (stability of equipment and footing), vehicular traffic, pedestrians, or livestock management. (interference with the work)
- f) Direct or indirect contact with live overhead lines via vegetation or uninsulated tools and equipment.
- g) Hazardous voltages may be present in all parts including the base of vegetation where it is in contact with live overhead lines, particularly during wet and/or windy conditions or with higher voltage powerlines.
- h) Falling vegetation from trimmings.
- i) Vehicle/Pedestrian traffic.

B Examples of Hazard controls

- a) Provision of a suitably trained and equipped safety observer.
- b) Increase the minimum distances required to safely carry out the vegetation management work including allowance for unexpected conductor movement.
- c) The use of suitable personal protective equipment.
- d) Establish vegetation drop zones.
- e) Traffic control.

3.2.2 Weather Conditions

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

- a) An electrical storm is observed in the vicinity of the worksite. (This decision is made in consultation with System Control)
- b) Any significant rain (beyond intermittent spotting), mist, fog, snow or sleet unless using methods and equipment specifically designed and tested as being able to operate in these conditions.
- c) Wind velocities that may result in conductor, EWP or vegetation unexpected movement sufficient to breach safe approach distances.
- d) Excessive wind velocities such that work cannot be carried out safely; and
- e) Lighting is not adequate.
- f) Extreme fire conditions have been declared.

3.2.3 Wearing of Metallic Objects

Metallic objects such as neck chains, earrings and other body adornments, rings, watches and bracelets shall not be worn while carrying out vegetation management work near live overhead lines.

3.2.4 Long Hair

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

3.3 Personal Protective Clothing and Equipment

When undertaking vegetation management work near live overhead power lines, all workers shall comply with the requirements set out in the Power and Water Personal Protective Clothing and Equipment Procedure. (Control0052)

For sections of line de-energised or under Access Authority conditions the PPE requirements remain the same as live conditions.

3.3.1 Neck to Wrist to Ankle (NWA) body protection consisting of:

Power and Water electrical workers or workers who work at electrical work sites are required to wear NWA arc rated PCC clothing to meet PPE 1 rating

- Long sleeved high-visibility collared shirt and long trousers which must be fully extended to ankle level, or NWA coveralls
- NWA wet weather protection
- PPC must conform to Class D/N AS/NZS 4602.1:2011 and where applicable, NFPA 70E
- Have non-metallic fasteners/zips to minimise conductivity

3.3.2 Protective Footwear:

Ankle high lace up footwear with protective toe capped boots conforming to AS/NZS 2210.3: 2009 occupational protective footwear and must be worn at all times.

3.3.3 Eye and Face Protection:

Personal eye protection must be worn at all times where there is risk of eye injury, when in operational areas and conforming with:

- AS/NZS 1337 Personal eye protection Part 1: Eye and face protectors for occupational applications
- AS/NZS 1336:2014 Eye and face protection – Guidelines in the form of Medium Impact rated spectacles (clear or tinted depending on UV protection required) or goggles/face shields
- Goggles/face shields or medium impact overlays may be worn over non-rated prescription spectacles
- Prescription, medium impact rated, Personal Eye Protection with side protection.

3.3.4 Hand Protection:

Hand protection must be used for all work tasks unless a documented risk assessment determines that the use of hand protection will introduce a new hazard (e.g. rotating equipment). Hand protection must be worn on each hand.

3.3.5 Head Protection:

Head protection in the form of occupational protective helmets (commonly referred to as “hard hats”) conforming to:

- AS/NZS 1800:1998 Occupational Protective Helmets – Selection, Care and Use
- AS/NZS 1801 Occupational Protective Helmets, must be worn in operational areas at all times unless:
- A documented risk assessment determines that the use of this form of PPE will introduce a new hazard
- An overhead risk does not exist if operating inside plant with Roll Over Protection (ROP’s) and Fall Overhead Protection (FOP’s) e.g. Fork Lifts, Excavators

The occupational protective helmets should be coloured white. A chin strap must be deployed when working aloft where risks (such as high winds or working position) are present to prevent the helmet falling. When undertaking tasks outdoors where there is no risk of falling objects workers may wear a wide brim sun hat. Additional protection for the neck and head can be provided by the wearing of an arc rated balaclava under a helmet.

3.3.6 Hearing Protection:

Appropriate hearing protection such as ear muffs or ear plugs must be worn when the noise level exceeds 85 dB (A).

3.4 Safety Observer

A safety observer(s) shall be appointed where any, person, mobile plant or equipment gets into a position where any part 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 at all times

The safety observer(s) shall:

- a) Be specifically instructed in the workplace hazards applicable and have authorisation and competency to the same level or higher as type of work being observed
- 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.
- c) Be positioned at a suitable location to effectively observe the work being performed.
- d) Not observe more than one vegetation management work activity at any time.
- e) Have the authority to temporarily suspend the work at any time.
- f) Maintain effective and immediate communication with the work team at all times.
- g) Not perform any other task while acting as a safety observer, which includes the passing of tools directly to the person performing the work,
- 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 deemed competent of performing rescue relevant to the work being undertaken.

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 formally handled such that all members of the work party are aware at all times who is performing the role of the safety observer(s).

3.5 Safe Approach Distances and Vegetation Clearances**3.5.1 General**

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

High voltage Aerial Bundled Cable with earthed metallic or semi-conductive screens are excluded. Safe approach distances for screened high voltage ABC shall be approved by the network operator.

The safe approach distances and vegetation clearances detailed in this work practice are the minimum distances and shall be applied by;

- Non-instructed persons carrying out tree trimming, pruning and ground works,
- Vegetation Workers performing vegetation management work.

Under all circumstances, cut, pruned or falling vegetation, tools, equipment, persons and mobile plant must remain at a distance greater than those distances listed in tables 1 to 4.

Vegetation must be cut, felled or pruned using controlled movements. The vegetation can either be controlled using insulated stick with a gripping tool attached, controlled by ropes or cut so as to fall away from the overhead Line.

In Table 5 where such control is not possible it is permissible to allow cut vegetation to pass through the vegetation clearance distance providing that the vegetation is cut into small pieces that prevent hanging up on, damage to, displacement of or the shorting out of the conductors.

Un-insulated tools, equipment and extensions are considered part of the person when applying Safe Approach Distances

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

When utilising insulated tools and equipment, the minimum length of insulating material between the operating head attachment and their closest point of contact must be equal to or greater than the personal safe approach distances.

Persons in training performing vegetation management work near live overhead lines, shall only work to the safe approach distances for Vegetation Workers. During training, trainees shall be under direct supervision by an authorised person at all times.

3.5.2 Conductor Sag and Sway Exclusion

The safe approach distances and vegetation clearances detailed in this work practice make no provision for conductor movement due to wind or change in conductor temperature.

Unexpected conductor movement may occur under moderate wind or changes in conductor heating or cooling factors. Conductor movement of several metres may result in longer span lengths

Appropriate allowance for sway and sag changes must be applied in accordance with advice sought from the network operator.

3.6 Safe Approach Distances for Persons, Plant and Vegetation

3.6.1 Non-instructed Persons

Non-instructed persons are not considered as vegetation management workers.

The safe approach distances for non-instructed persons are taken from the ENA DOC 23-2009

Table 1 of this work practice provides a guide for Power Services representative to provide advice to non-instructed persons carrying out tree clearing and pruning work in the vicinity of overhead lines.

Non-instructed persons can undertake tree clearing and pruning work which is at a distance greater, and remains greater than the minimum safe approach distances outlined in Table 1.

Non-instructed persons are not permitted to:

- Operate mobile plant above overhead lines, or
- Cut vegetation vertically above overhead lines

Table 1 Safe Approach Distance and Vegetation clearances for Non-instructed persons			
Phase to Phase AC Voltage	Person, tools and Equipment	Mobile Plant	Cannot cut Vegetation within
Insulated LV	3000mm	3000mm	500mm
Bare LV	3000mm	3000mm	1000mm
1KV to 11KV	3000mm	3000mm	2000mm
22KV to 132KV	3000mm	3000mm	3000mm
Distances taken from table 1 ENA DOC 23-2009			

3.6.2 Vegetation Workers

Vegetation management Workers performing vegetation management work from either within a tree or from the ground with in clearances of overhead power lines shall be instructed or authorised persons.

Ground workers not involved in trimming or pruning vegetation within safe approach distances of overhead powerlines are not required to be instructed or authorised.

Climbers shall not climb any vegetation where any part of it is within or may move within the vegetation clearance distances noted in Column A of Table 2.

Climbers shall be attached to the tree at all times by means of a climbing rope, sling or safety line and shall not position themselves so that they could fall or swing into the conductors or in any way breach the safe approach distances listed in Table 2.

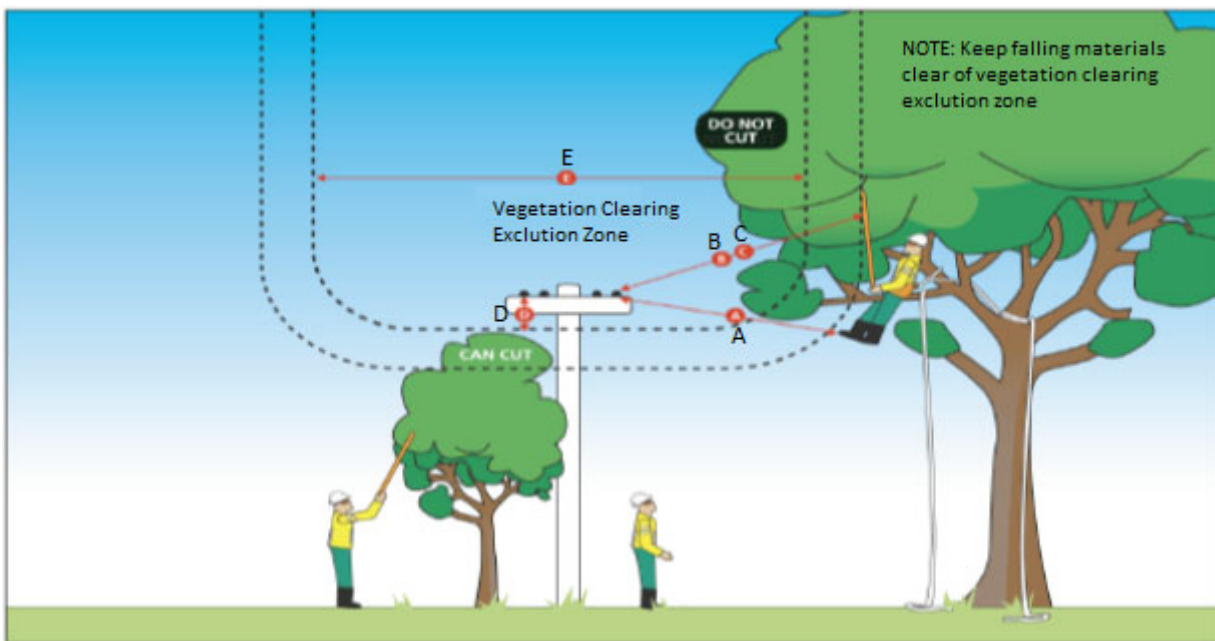
A safety observer shall be used in accordance with the requirements Section 3.4 of this work practice.

In Table 2:

- The minimum safe approach distances for vegetation, climbers, ground workers, tools and equipment have been taken from (ENA DOC 23-2009)
- For LV in column B a distance of 200mm between the cutting device and the conductor shall be applied while cutting device is in operation

Table 2 Safe Approach Distance and Vegetation Clearance for Vegetation Workers					
Phase to Phase AC Voltage Refer Figure 1	Climber and Ground Worker A	Insulated Tool or Extention B	Uninsulated tool or Extention C	Vegetation Below or beside OH line D	Vegetation Overhanging OH lines E
Insulated LV	200mm	Phisycal Clearance	200mm	No Clearance required	No Clearance required
Bare LV	1000mm	Phisycal Clearance	1000mm	No Clearance required	Note 2
11/22KV	1200mm	700mm	1200mm	700mm	Vegetation Management Work Not Permitted
33KV	1200mm	700mm	1200mm	700mm	
66KV	1400mm	1000mm	1400mm	1000mm	
132KV	1800mm	1200mm	1800mm	1200mm	
Distances taken from table 2 ENA DOC 23-2009 and the Power Services AWW Procedure					
NOTE 1: Refer to figure one (1) for all clearances except for LV clearances					
NOTE 2: BARE LV ONLY					
<ul style="list-style-type: none"> • For Climbers, Vegetation management work above LV mains NOT permitted. • For Vegetation Workers, Vegetation management works above LV mains permitted 					

Figure 1 Clearance distances for vegetation workers (refer table 1)



3.6.3 Utilising Un-insulated Mobile Plant, Tools and Equipment

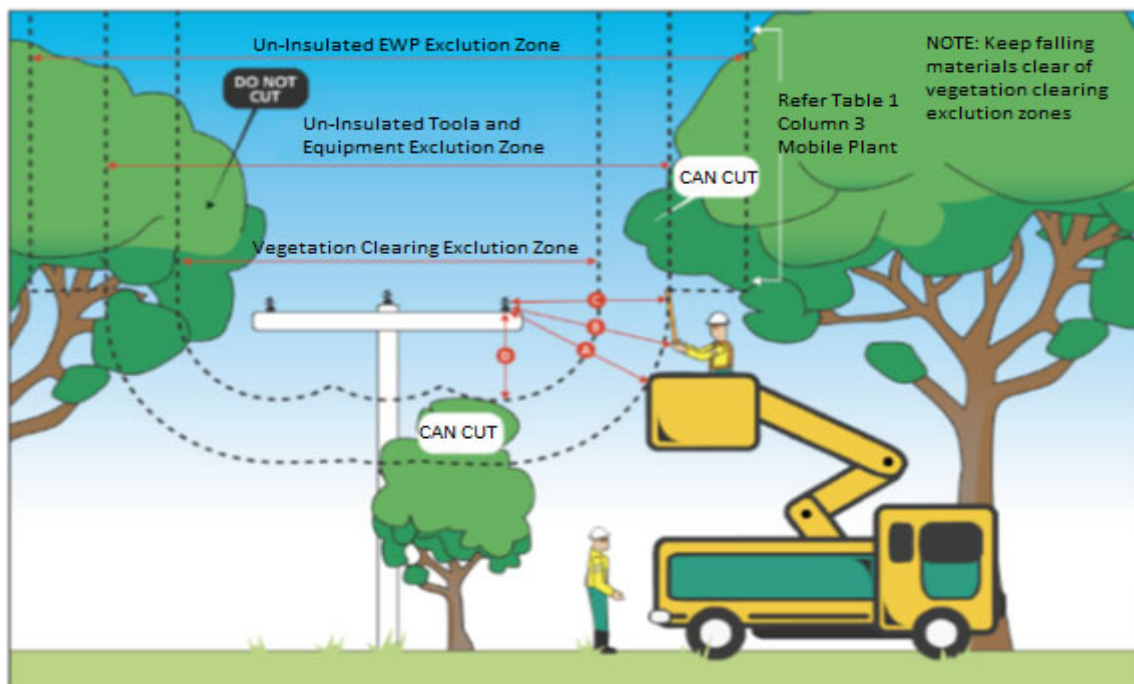
Instructed and Authorised persons performing vegetation management work near live overhead power lines using un-insulated plant, tools and equipment shall maintain the distances listed in Table 3.

An un-insulated Elevating Work Platform (EWP) shall not go higher than the lowest live conductor unless working outside the safe approach distances for non-instructed persons as stated in Section 3.6.1 of these work practice.

A safety observer shall be used in accordance with the requirements of Section 3.6.1 of this Procedure.

Table 3 Safe Approach Distance and Vegetation Clearance for Vegetation Workers using an Un-insulated EWP, Un-insulated Tools and Equipment					
Phase to Phase AC Voltage	Un-insulated EWP	Person	Uninsulated tool or Extension	Vegetation Below or beside OH line	Vegetation Overhanging OH lines
Refer Figure 1	A	B	C	D	E
Insulated LV	200mm	200mm	200mm	No Clearance required	No Clearance required
Bare LV	1000mm	1000mm	1000mm	Physical Clearance	Vegetation Management Work Not Permitted
11/22KV	1200mm	1200mm	1200mm	700mm	
33KV	1200mm	1200mm	1200mm	700mm	
66KV	1400mm	1400mm	1400mm	1000mm	
132KV	1800mm	1800mm	1800mm	1200mm	
Distances taken from table 3 ENA DOC 23-2009 and the Power Services AWW Procedure					
Refer figure 2					

Figure 2: Clearance distance for un-insulated EWP, tools and equipment (Refer table 3)



3.6.4 Utilising Uninsulated Mobile Plant with insulated Tools and Equipment

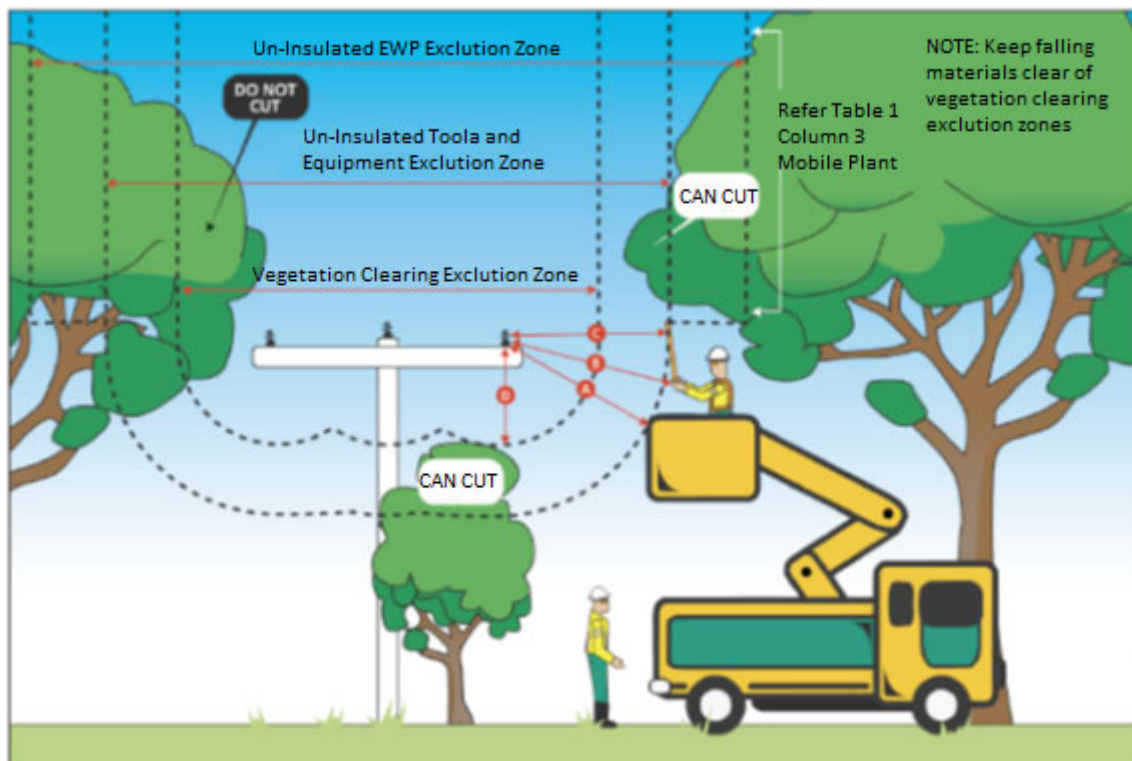
Vegetation Workers using un-insulated mobile plant, with insulated tools and equipment shall maintain safe approach distances listed in Table 4.

An uninsulated EWP shall not go higher than the lowest live conductor unless working at safe approach distances greater than that of a non-instructed person as stated in Section 3.6.1.

A safety observer shall be used in accordance with the requirements of Section 3.6.1

Table 4 Safe Approach Distance and Vegetation Clearance for Vegetation Workers using Un-insulated EWP with insulated Tools and Equipment					
Phase to Phase AC Voltage Refer Figure 1	Un-insulated EWP or Platform A	Person B	Insulated tool or Extention C	Vegetation Below or beside OH line D	Vegetation Overhanging OH lines E
Insulated LV	1000mm	1000mm	No Clearance required	No Clearance required	No Clearance required
Bare LV	1000mm	1000mm	No Clearance required	No Clearance required	Vegetation Management Work Not Permitted
11/22KV	1200mm	1200mm	350mm	350mm	
33KV	1200mm	1200mm	400mm	400mm	
66KV	1400mm	1400mm	600mm	600mm	
132KV	1800mm	1800mm	800mm	800mm	
Distances taken from table 4 ENA DOC 23-2009 and the Power Services AWW Procedure					
Refer figure 3					

Figure 3: Clearance distance for insulated EWP, tools and equipment (Refer table 4)



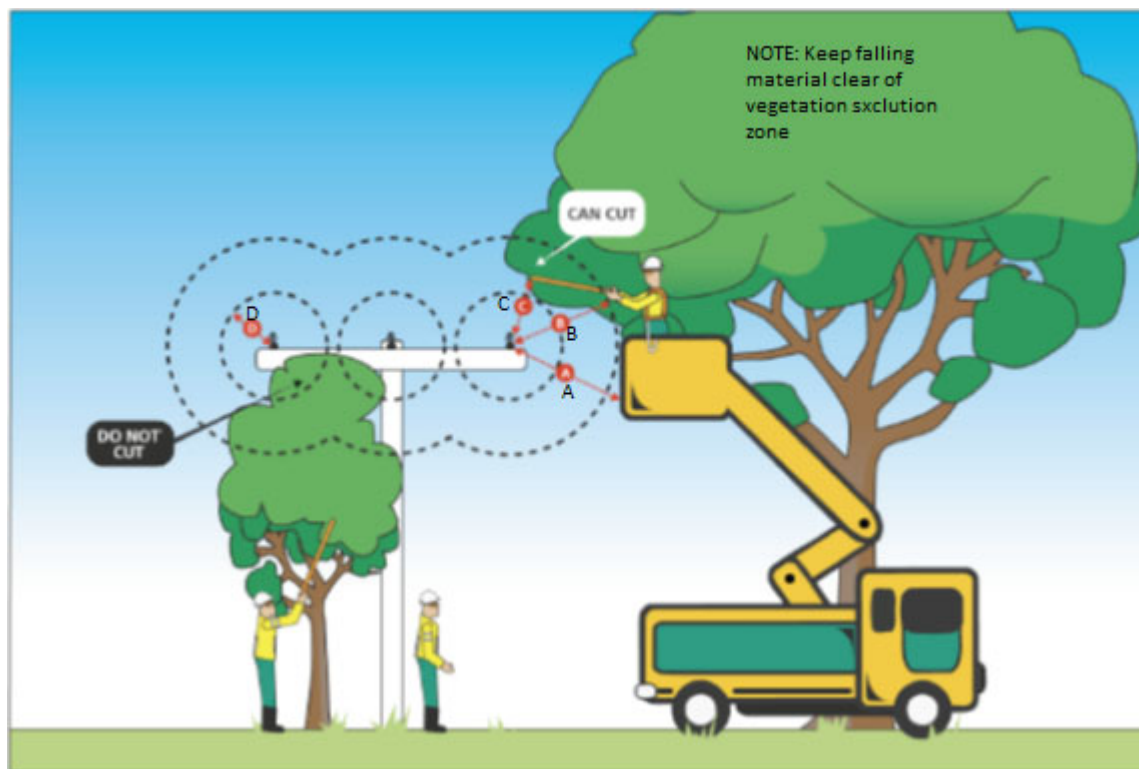
3.6.5 Utilising Insulated Mobile Plant with Insulated Tools and Equipment

Vegetation Workers performing vegetation management work near live overhead power lines using an insulated EWP or insulated platform and insulated tool and equipment, shall maintain the distances listed in Table 5.

A safety observer shall be used in accordance with the requirements of Section 3.4

Table 5 Safe Approach Distance and Vegetation Clearance for Vegetation Workers using insulated EWP, Tools and Equipment				
Phase to Phase AC Voltage Refer Figure 1	Insulated EWP or Platform A	Person B	Insulated tool or Extention C	Vegetation Below or beside OH line D
Insulated LV	Contact allowed	Physical Clearance	No Clearance required	No Clearance required
11/22KV	700mm	700mm	350mm	150mm
33KV	700mm	700mm	400mm	200mm
66KV	1000mm	1000mm	600mm	400mm
132KV	1200mm	1200mm	800mm	800mm
Distances taken from table ENA DOC 23-2009 and the Power Services AWW Procedure				
Refer figure 4				

Figure 4: Clearance distance for insulated EWP, tools and equipment (Refer table 5)



3.6.6 Tools and Equipment

The minimum safe approach distances for insulated and un-insulated tools & equipment is specified in Tables 1 – 5

3.6.7 Varying Safe Approach Distances

Power and Water may vary safe approach distances in accordance with their network characteristics or legislative requirements.

Power and Water may otherwise, in certain circumstances, increase or decrease the safe approach distances for vegetation management work.

If the safe approach distances are to be reduced additional controls, instructions and authorisations shall be applied to the vegetation management work to ensure a safe system of work. This shall only be carried out in accordance with ENA NENS 04-2006

3.7 Competency and Authorisation

3.7.1 Competency

Power Service shall ensure all vegetation workers have current competency to carry out vegetation management work near live overhead lines.

3.7.2 Authorisation

Authorisation is the process of registering a vegetation management worker in writing with the network operator to work near live overhead lines

It is the responsibility of the employer to obtain authorisation for their employees to undertake vegetation management work.

The authorisation shall be revoked for failure to comply with the requirements of Section 3.2 of this work practice and/or the requirements of the network operators.

Copies of competencies and authorisations shall be stored in the Power and Water Site Pass data base

3.7.3 Compliance Auditing

Power Services shall independently audit the compliance of the vegetation management worker(s) against documented vegetation management work procedures by conducting field audits at least annually.

Audits shall be conducted by an authorised person who;

- a) Is appointed by the Power Services.
- b) Has a comprehensive understanding and experience of the work procedures being inspected.
- c) Is independent of the work party.
- d) Has the relevant qualifications to conduct an audit.

All audits are to be documented, recorded and where required kept in accordance with legislative requirements.

3.8 Tools and Equipment

3.8.1 General

Care and maintenance of tools and equipment is essential for safe vegetation management work near live overhead lines. This is especially the case for insulated tools and equipment. Power Services and contractors shall ensure all tools and equipment used for vegetation management work are inspected, maintained and tested at appropriate intervals and in accordance with the manufacturer's recommendations.

Appropriate records shall be kept in accordance with legislative requirements.

Where practicable, the tools and equipment should be marked with an inspected and/or tested date.

3.8.2 Insulated Tools & Equipment

All insulated tools and equipment used for vegetation management work shall be designed, tested and approved specifically for work near live overhead lines.

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 clean before each use.

Insulated tools and equipment that appears to be defective shall be tagged out of service, and sent for repairs and testing

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 deteriorate insulating qualities of equipment.

3.8.3 Insulating Barriers

Insulating barriers are intended to prevent vegetation management workers, tools, equipment, plant and vegetation from making inadvertent contact with live overhead lines.

Insulating barriers shall not be used to reduce the safe approach distances for vegetation management workers

Insulating barriers shall only be inspected applied and removed by authorised persons approved to perform the task.

3.8.4 Safety Belts and Harnesses

Safety belts and harnesses shall comply with AS 1891.1 – 1995 and/or AS 2626.

Safety belts and harnesses used by climbers may have a tool strop or “D” ring on the belt or harness used for attachment of tools. The tool strop or “D” ring shall be sufficiently weak to snap under sudden pressure to prevent the climber being pulled to the ground if the timber should fall onto their tools and drag them downwards.

The free end of body belts, pole straps and ropes shall be restrained from breaching the minimum safe approach distance.

3.8.5 Ladders

Only ladders with insulating properties shall be used to provide access for vegetation management workers to their work position near live overhead power lines.

Ladders shall comply with the AS 1892.2 and to ANSI A14.5 – 1982.

Metal ladders or metal reinforced ladders shall not be used, except where they form part of a permanent structure, such as transmission tower.

3.8.6 Ropes

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 the integrity of the rope.

Non-conducting rope may be used in series with an insulating stick or composite insulator to provide known insulating properties. Non-conducting rope shall be kept away from live components, by a distance at least equal to the applicable safe approach distances.

3.8.7 Testing

The recommended maximum testing intervals are defined in appropriate internationally recognised Standards. A summary of the testing frequency is set out in the Table 6 below.

Table 6
Testing Requirements

Equipment	Testing Intervals
Insulated tools and equipment	Not exceeding 12 months
High Voltage insulating line hoses, connectors and covers	Not exceeding 12 months
Insulated EWP	Not exceeding 6 months
<ul style="list-style-type: none"> • The above testing intervals should be reduced for equipment with high usage or in a dirty environment • All insulated tools and equipment that have been tested, shall be marked with an appropriate electrical design rating for the voltage of the overhead lines being worked on or near 	
Testing intervals taken from table 6 ENA DOC 23-2009	

3.9 Cranes and Elevated Work Platforms (EWPs)

3.9.1 General

Cranes and EWPs set up in accordance with the requirements of this section may be used to support vegetation, workers and equipment for vegetation management work near live overhead lines.

The EWP insulated sections should be maintained and in a clean condition.

Tables 3, 4 and 5 provides the safe approach distances for insulated and uninsulated sections of mobile plant operated by an vegetation Worker, with a safety observer.

Insulated EWPs and other machinery used for vegetation management work shall have passed acceptance and periodic routine electrical tests in accordance with AS 1418.1-2002 and shall be maintained in accordance with AS 2550.1-2011

3.9.2 Supporting Vegetation within the Safe Approach Distance

When supporting vegetation that has any part within the safe approach distance for mobile plant operated by instructed persons or authorised persons of live high voltage overhead lines, appropriate insulating equipment, rated to meet the electrical and mechanical loads, shall be fitted between the crane or EWP and the vegetation.

3.9.3 Earthing and Bonding of the Chassis of the Crane or EWP

The chassis of the crane or EWP may, where relevant and practical, be earthed and bonded to create an equipotential work zone. A work practice shall be adopted that ensures ground workers and the public are kept clear of mobile plant when work is being performed near live overhead lines. Ropes/tapes/barriers and signs may be used to advise persons to keep away from the crane or EWP.

3.10 Work Considerations

3.10.1 Request for Access (Access Authority to Work)

A Request for Access shall be applied for 10 business days prior to the work commencing. An Access Authority shall be issued to the work party where vegetation management work is to be performed on vegetation which has any part within, or likely to come within, the safe approach distances for a vegetation worker of live exposed high voltage overhead lines.

The Access Authority shall be cancelled on completion of the work.

If it becomes necessary to suspend work;

- The work-site shall be left in a safe condition.
- The Network Operator shall be notified.
- The Access Authority shall be surrendered and cancelled.

- The network put back to normal operation.

3.10.2 Auto-reclose Functions (Single Shot)

A Request for Access shall be applied for five (5) business days prior to the work commencing to have the Auto Re-close (ARC) placed into single shot.

- Authorised and instructed Power and Water employees and contractors where vegetation management work is to be performed can commence works after notifying system control
- Private vegetation management is required to have an Access to Work in the Vicinity to be issued and an authorised person to supervise the vegetation management

Reclosing function shall be identified as disabled in accordance with the Network Operator's requirements

In these circumstances, it is necessary for the Power Services contracts Manager to assess what additional safeguards may be required to ensure that the work can be performed safely.

This review shall include, but not necessarily be limited to, an assessment of any changes to minimum safe approach distances that may be required due to potentially higher switching surge levels.

3.10.3 Communications

The vegetation management work team using a work permit shall establish a reliable on-site two-way communication links with System Control and Power Services. The links should be continuously available.

The work team shall establish and maintain effective communication between the work team members to ensure the safety of the team.

A procedure/protocol shall be in place for contacting emergency services should an incident occur.

3.10.4 Public Safety

Power Services shall have in place documented work procedures to ensure that all members of the public are kept clear of the work site while vegetation management work is in progress.

3.11 Process in the Event of an Incident

3.11.1 Events Constituting an Incident

For the purpose of this Work Practice, an incident is defined as any of the following events:

- a) An electric shock or other serious injury received by any member of the work team or member of the public;
- b) A flashover at, or close to, the worksite for any reason;
- c) Complete or partial breakdown of any insulated tool or equipment irrespective of whether flashover occurred;
- d) The electrical or mechanical failures of any insulated tool, which did, or could have the potential to, cause an accident; and
- e) Any occurrence, which is life threatening or has the potential to cause personal injury or damage to property.

3.11.2 Process for Responding to Incidents

Power Services and contractors shall have in place documented processes for responding to incidents. These Process shall address, as appropriate, the following items:

- a) The rescue of injured persons or those at risk;
- b) The immediate first aid and medical needs of any injured person and the safety of other persons at the worksite;
- c) Any emergency switching requirements;
- d) Restoration of any supply as a result of the incident;
- e) Investigation and reporting requirements to determine the cause of the incident and the implementation of appropriate remedial measures; and
- f) Notification of all parties required under relevant regulations and industry agreements.

4 Definitions

Where terms or words are not included in the definitions section, refer to our glossary for clarification. The glossary is available in our process improvement and event information management system.

Term	Definition
Access Authority	Documented approval which permits access to work on or test apparatus.
Amenity trees	Trees with recreational, functional, environmental, ecological, social, health or aesthetic value rather than for production purposes.
Approved	Having appropriate organisation endorsement in writing.
Authority to Work in the Vicinity (AWV)	An authority issued to a person when work is required to be performed in the vicinity of apparatus.
Authorised person	A competent person with technical knowledge or sufficient experience who has been approved to act on behalf of Power and Water to perform the duty concerned.
Auto-reclose	A function used to automatically re-close electrical circuits after a fault has occurred and will lock out after three (3) operations
Bare Conductor	Refers to the electrical conductor having no insulation
Cable	An insulated conductor or two or more such conductors laid together, whether with or without fillings, reinforcements or protective coverings.
Clearance zone	The area surrounding a power line as indicated on the drawings and tables in this document.
Climber	A vegetation management worker who works on vegetation while supported by that vegetation
Competent	Having the skills, knowledge and attributes a person needs to complete a task.
Conductor	A wire, cable or form of metal designed for carrying electric current.
De-energised	Not connected to any source of supply but not necessarily isolated.
Earthed	Directly connected to the general mass of earth to ensure and maintain the effective dissipation of electrical energy.
Electrical Apparatus	Any electrical equipment, including electrical motors, transformers, switchgear, overhead lines and underground cables, the conductors of which are live or can be made live.
Electrical work	The manufacturing, constructing, installing, testing, maintaining, repairing, altering, removing, or replacing of electrical equipment.
Electricity network	The assets that together are operated by the network provider for the purposes of transporting electricity from generators of electricity to a transfer point with another network or to consumers of electricity.
Employee	A person employed by Power and Water, a contractor or subcontractor, and a person employed by a contractor or subcontractor, who carries out work for Power and Water.
Energised	Connected to a source of energy
Exposed conductor	A 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.
Exclusion zone	An area near the electrical apparatus into which no part of the person, mobile plant, tools & equipment (other than approved insulated tools & equipment) may encroach
Ground Worker	A worker that carries out vegetation management work from the ground.

POWER SERVICES – WORK PRACTICE STANDARD

Term	Definition
High voltage (HV)	A nominal voltage exceeding 1000 volts alternating current or exceeding 1500 volts direct current.
Instructed person	A person, with appropriate training or experience to enable them to identify high voltage and low voltage conductors and to be aware of the hazards electricity may present.
Insulated	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.
Insulating Barrier	(Also called Cover-up equipment) A barrier of insulating material specifically designed, approved and tested for use as a line cover, or as a cover for similar equipment. Insulating barriers may be rigid or flexible and are intended to prevent vegetation management workers, tools, equipment, plant and vegetation from making inadvertent contact with live overhead lines.
Insulated Equipment	Plant, tools and equipment specifically designed, approved, tested and maintained for use on or near live electrical apparatus.
In the vicinity	Either a situation where: <ul style="list-style-type: none"> • A person is in close proximity to and there is a risk of either directly, or through any conducting medium, of unintentionally coming within relevant safe approach distances to live conductors; or • There is a likelihood of unintentional contact with electrical apparatus or services that could cause personal injury or damage.
Isolated	One or a number of devices have been operated to separate apparatus from unwanted sources of energy and/or means of activation and the devices rendered incapable of being unintentionally re-activated.
Landowner	The person who has title to the land or in the case of a local authority or government agency that entity which has control over the land.
Live	Energised or subject to hazardous induced or capacitive voltages.
Live work	All work performed on components of electrical apparatus not isolated.
Low voltage (LV)	Nominal voltage exceeding 50 volts alternating current or 120 volts direct current but not exceeding 1000 volts alternating current or 1500 volts direct current.
Minimum Approach Distance (MAD)	see “Safe approach distance”
Mobile plant	A crane, elevating platform, tip-truck or similar plant, any equipment fitted with a jib or boom including excavation equipment and any device capable of raising or lowering a load.
Network Operator	The owner, controller or operator of an electricity network.
Non-Conducting Rope	Standard commercial grade synthetic rope, made from a material, which is known to have insulating properties. Non-conducting rope is not electrically tested. It is not to be intentionally placed across phase to phase or phase to earth air gaps.
Non-instructed person	A person, without appropriate training or experience to enable them to identify high voltage and low voltage conductors and to be aware of the hazards electricity may present.
Not electrically connected	Electrical apparatus disconnected from all sources of supply by the removal or absence of conductors, appropriate to the voltage and insulating medium and, not able to be energised by electrical operating work.
Overhead line	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.

POWER SERVICES – WORK PRACTICE STANDARD

Term	Definition
Person in charge	The person who has the responsibility of ensuring the safe conduct of work under their control.
Personnel	People employed in an organization or engaged in an organized undertaking
Plant	Any plant or equipment that is not connected to the distribution system Any machinery, equipment, appliance, container, implement or tool, any component of any of those things and anything fitted or connected to any of those things. Examples of plant include lifts, cranes, computers, machinery conveyors, forklifts, vehicles, power tools and amusement devices.
Procedure	The documentation of a systematic series of actions (or activities) directed to achieve a desired result.
Request for access (RFA)	A formal request for permission to work or test on apparatus, enter a confined space or conduct hot work.
Risk assessment	The systematic process of identifying hazards and impacts, and estimating risk based on the likelihood of a hazard or event causing harm and the consequences associated with the same hazard or event.
Safe approach distance	The minimum separation in air from a live exposed conductor that shall be maintained by a person, or any object (other than insulated objects designed for contact with live conductors) held by or in contact with that person.
Safety Observer	A competent person assigned the solitary duty of observing and/or monitoring the safety of person/s in potentially hazardous situations and providing warnings, where necessary.
Screened cable	Insulation covering the conductor cores, is covered by a conducting or semi-conducting material, which is connected to a neutral, or earth.
Suitable species	Generally any tree or shrub which when mature does not exceed 3m in height.
Shall	Mandatory.
Should	Advisory or discretionary.
System Control	Hudson Creek System Control Centre, (HSCCC). Network Operator
Tested	Tested in accordance with the relevant standards.
Training	As used in this document, the term ‘training’ refers to the broader definition of information, training, instruction and supervision, as specified in Section 19(3) (f) of the WHS (NUL) Act.
Registered Training Organisation (RTO)	An education or training organisation, which is registered under the appropriate state or federal legislation.
Vegetation	Any living or non-living flora or any part of that flora.
Vegetation Clearance	The minimum separation in air that shall be maintained between vegetation and live electrical apparatus when performing vegetation management work. High risk vegetation is within 1.5 metres of HV and 0.5 metres of LV conductor.
Vegetation Management Work	The pruning, cutting, trimming or felling of, or application of herbicides to, vegetation and the assisting to prune, cut, trim or fell, or apply herbicides to, vegetation, where any part of the vegetation is or may come within, or the work requires any person, tool, equipment or vehicle to come within, the safe approach distance for ordinary persons for live overhead lines.
Vegetation Worker	An employee whose qualifications, experience and ongoing training and assessment ensure competency in the performance of vegetation management work near live overhead lines.

5 Change Management and Continuous Improvement

5.1 Consultation, Approval and Communication

This work instruction must be endorsed by the Line Manager/or Subject Matter Expert and approved by the Accountable Manager.

Role / title	Requirement
Power Services General Manager	<ul style="list-style-type: none"> ▪ Accountable - approve this document ▪ Ensure that safe vegetation management practices near overhead lines are undertaken as required. ▪ Ensure and facilitate that Power Networks best interests are achieved through cooperative arrangements with NT Government agencies, local Councils, private landowners and other stakeholders in relation to vegetation management near powerlines.
Office of the General Counsel	Provide advice regarding Aboriginal Areas Protection Authority applications, easement, crown land and land owner issues. Permit requirements under the Planning Act.
Manager Environmental Services	<ul style="list-style-type: none"> ▪ Ensure that land management practices are undertaken as required. ▪ Provide advice and approval regarding appropriate land management practices to Project Managers, other Power Networks project personnel, and Contractors. ▪ Assist, as required, with the implementation of land management practices.
Power Services Manager Asset Management	<ul style="list-style-type: none"> ▪ Liaise with the relevant sections of Government Departments of regarding land management issues as required. ▪ Provide advice and approval for Easement Controlled, and Prohibited Activities ▪ Determine frequency of cyclic maintenance periods (Preventative Maintenance dates) ▪ Provide problem vegetation feeder performance locations
Power Services contracts manager	<ul style="list-style-type: none"> ▪ Manage the vegetation in proximity to overhead powerlines Contract. Ensure compliance and control expenditure. ▪ Ensure Contractor Audits and Scopes are completed identifying work type and location to achieve Preventative Maintenance dates ▪ Implement necessary actions to remove high risk vegetation ▪ Maintain documentation of conforming status of vegetation clearance from conductor via audits ▪ Identify problem areas for alternative method of feed ie: Bundled Conductor, Underground ▪ Maintain easement access to network via slashing / mulching program ▪ Ensure Liaison with Property Owners, Councils and Government Departments prior to commencing work
Work Practices	<ul style="list-style-type: none"> ▪ Communicate/consult – inform of any changes
Power Services Employees	<ul style="list-style-type: none"> ▪ Undertake works in an appropriate manner in order to maintain minimum vegetation clearances. ▪ Report identified areas with non conforming feeder vegetation.

5.2 Review

The requirements of this work instruction are mandatory and shall be reviewed and updated periodically for its ongoing effectiveness. This work instruction will be reviewed, at a minimum, every three years or in the event of any significant change in our vision, values, long term goals, risk appetite, policy statement business model or organisational structure, or related systems or processes.

5.3 Internal References and Related Documents

Document Title	Record Number
Work Health & Safety Risk Management	CONTROL0068
Power Services – Vegetation Clearance	CONTROL0583
Personal Protective Clothing and Equipment (PPC & E) Procedure	CONTROL0052
WPS027 - Work Site Pre Start Meetings	BDOC2014/252
Request for Access	CONTROL0588
Electrical Authorisations Procedure	CONTROL0587
Work in the Vicinity of Electrical Apparatus Procedure	BDOC2016/56
Access to Low Voltage (LV) Apparatus	CONTROL0582
Access to HV Apparatus Procedure	CONTROL0581
Power Networks NP021 Easement Guidelines	QDOC2008/741
Access to Apparatus Rules Manual	QDOC2011/60
Design Data Route Clearance Distribution and Transmission lines	S01-04-01-04

5.4 External References, Legislative and Regulatory Obligations

- AS 1891.1 – 1995” “Industrial Fall Arrest Systems and Devices
- AS 2626 Industrial Safety Belts & Harnesses.
- AS 1892.2 Portable Ladders Wooden
- ANSI A14.5 – 1982 for Fibreglass Ladders.
- AS1418.1-2002 Cranes, Hoists and Winches
- AS 2550.1-2011 Use of cranes, hoists and winches
- ENA NENS 04 – National Guidelines for Safe Approach Distances to Electrical and MeacanicalApparatus
- ENA NENS 02 – National electricity Network Operator and Service Provider Safety Assurance Guidelines
- ENA DOC 023-2009 – ENA Guidelines for Vegetation Management

5.5 Records Management

This work instruction and all related documents, are captured, stored and managed in our Electronic Document and Records Management System and controlled in the Controlled Document Register.

5.6 Improvement Suggestions

Improvement suggestions are captured and managed in our process improvement and event information management system. To log an improvement suggestion for this document please see the ‘how to report an event’ user guide located on our intranet or contact events@powerwater.com.au.

5.7 Document History

Date of Issue	Version	Prepared By	Description of Changes
23/8/2021	1.0	Nick Coe	Converted to new format Extensive changes and alterations to bring in line with current legislation and standards Original Document BDOC2014/475

6 Appendices

A APPENDIX 1: Extract from Electricity Reform Act

Division 4 Powers relating to vegetation management

64 Entry to place to clear vegetation

1. Subject to this section, an electricity officer for an electricity entity that has a licence to operate an electricity network may, at any reasonable time, enter and remain in a place to which electricity is, is to be, or has been transmitted or distributed by the entity to clear vegetation from interfering with powerlines if, in the entity's opinion, it is necessary to do so to avert interruption to the electricity supply to the place or to another place.
2. If an electricity officer seeks to enter a place under this section and, after consulting the occupier of the place, entry is refused or the officer is obstructed from entering the place, the electricity entity may:
 - i. By written notice to the occupier of the place – ask the occupier to consent to an electricity officer entering the place; or
 - ii. Apply under Part 8 for a warrant to enter the place.
3. The notice must state the reason why entry to the place is required and the date and time of the proposed entry.
4. The electricity entity must make good any damage caused to a place by the exercise of its powers under this section or pay reasonable compensation for the damage.
5. The electricity entity is liable for any costs associated with clearing vegetation under this section.
6. An electricity officer cannot enter a place under this section unless he or she has complied with the regulations (if any) relating to negotiating with, and obtaining the consent of, the occupier of the place.