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SPECIAL

Subordinate Legislation Act 1994

State Electricity Commission Act 1958

Code of Practice for Powerline Clearance (Vegetation) Regulations 1996

NOTICE OF DECISION

I, Alan Stockdale, Treasurer, give notice that under section 12 of the **Subordinate Legislation Act 1994,** I have decided that the proposed Code of Practice for Powerline Clearance (Vegetation) Regulations 1996 be made.

A Regulatory Impact Statement was prepared and advertised inviting public comment and submissions. Based on the comments submitted, together with the comments received from the advertisement under the State Electricity Commission Act 1958, amendments were made to the proposed Code of Practice for Powerline Clearance (Vegetation) 1996.

Alan R. Stockdale
Treasurer

CODE OF PRACTICE FOR POWERLINE CLEARANCE (VEGETATION) 1996

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1 Introduction

History shows that escape of electricity from a powerline to vegetation has started fires, causing death and property damage.

1.1 Objectives of Code

The objectives of the Code are to:

(a) ensure public safety;

(b) establish a standard of care which must be observed when powerlines operate near vegetation;

(c) reduce vegetation related interruptions to electricity supply;

(d) ensure that management procedures balance fire safety, reliability of the electricity system and community costs with conservation values, in the best interests of the people of Victoria; and

(e) ensure that management procedures minimise the effect of powerlines on vegetation and establish strategies to progressively achieve a sustainable environment unaffected by the presence of powerlines.

1.2 Application of Code

The Code applies to any powerline which operates at a voltage of 66,000 volts or less.

1.3 Purpose of Code

The purpose of this Code is to set out:

(a) the applicable standards and practices when pruning or clearing vegetation near powerlines;

(b) who is responsible for maintaining clearance between powerlines and vegetation;

(c) the duties of the responsible person; and

(d) management procedures to minimise the danger of a powerline causing a fire through contact with vegetation.

1.4 Management Procedures

1.4.1

To enable a responsible person to develop management procedures specific and responsive to local needs, the Code has set performance objectives for the execution of a responsible person's duties and measures to validate their effectiveness.

1.4.2

A responsible person, with the exception of an occupier of land, will be required to incorporate his or her management procedures into a management plan which will require endorsement by the Chief Electrical Inspector as fulfilling the purpose of the Code and its objectives.

1.5 Enforcement of Code

A person who contravenes sections 6.2(a), 6.2(b), 6.2(c), 6.4, 6.5, 6.7.1, 6.7.2, 7.1 or 7.2.1 is guilty of an offence and is liable to a penalty of not more than 50 penalty units as stated under section 65(5) of the State Electricity Commission Act 1958.

1.6 Enabling Power of Code

Under section 65(1) of the State Electricity Commission Act 1958, regulations may be made for --

"(d) the Code of Practice for Powerline Clearance setting out--
- (i) the duties of responsible persons;
- (ii) the standards and practices to be adopted and observed in tree pruning or clearing in the vicinity of powerlines;
- (iii) management procedures to minimise danger of powerlines causing fire by contact with vegetation;
- (iv) any other matters for or with respect to the maintenance of powerlines."

2 Definitions

In this Code, the following definitions apply:

'Act'	means the State Electricity Commission Act 1958.
'aerial bundled cable'	means an insulated cable manufactured to Australian Standard AS 3560 or AS 3599 Part 1 or AS 3599 Part 2 used in substitution for multiple bare conductors.
'affected person'	means-- (a) an occupier of land: (i) with powerlines, on the land; or (ii) whose land is abutting public land with powerlines and the pruning or clearing of vegetation to maintain powerline clearance will affect the use of the occupier's land; or (b) any responsible authority pursuant to section 13 of the Planning and Environment Act 1987.
'area of particular significance'	means an area determined by the Minister to be an area of particular significance. The procedure for identification and determination of these areas is described in section 9.
'category 1 area'	means an urban area which-- (a) will not be given a fire hazard rating by the fire control authority; or (b) has been given a fire hazard rating of "low" by the fire control authority; or (c) has been given a fire hazard rating of "low moderate" by the fire control authority and after consultation between the distribution company, the responsible person and the fire control authority, the risk of fire ignition is not considered high; or

(d) is yet to have a fire hazard rating allocated by the fire control authority but where, in the opinion of the fire control authority, the combination of normal build-up of vegetation and general weather conditions could reasonably be expected not to produce conditions conducive to the ignition and/or rapid spread of fire.

'category 2 area' means--

(a) all rural areas; or

(b) an urban area for which the fire control authority has allocated a fire hazard rating of "high moderate"; or

(c) an urban area which has been allocated a fire hazard rating of "low moderate" by the fire control authority and where, after consultation between the distribution company, the responsible person and the fire control authority, the risk of fire ignition is considered high, but for other reasons the "low moderate" classification was assigned; or

(d) an urban area which is yet to have a fire hazard rating allocated by the fire control authority but where, in the opinion of the fire control authority, the combination of normal build-up of vegetation and general weather conditions can reasonably be expected to produce conditions conducive to the ignition and/or rapid spread of fire; or

(e) any area not otherwise defined.

'Chief Electrical Inspector' means the Chief Electrical Inspector appointed under Part 4 of the Electricity Industry Act 1993.

'clearance space' means a space surrounding a powerline which **must** be clear of vegetation at all times.

'conservation' includes preservation, maintenance, sustainable use and restoration of natural and cultural environment.

'construct' includes to reconstruct or make structural changes, and 'construction' has a corresponding meaning.

'declared area' means an area declared under section 65(3) and 65(4) of the Act by the Governor in Council by Order in Council in the Government Gazette.

'distribution company' means--

(a) a company to which a licence to distribute electricity was issued under Part 12 of the Electricity Industry Act 1993 on 3 October 1994, if the company continues to hold such a licence; or

(b) a person who is the holder of a licence to distribute electricity issued under Part 12 of the Electricity Industry Act 1993, being a person declared by Order of the Governor in Council published in the Government Gazette to be a distribution company for the purposes of the Act.

'easement' means an easement for the purpose of transmitting, distributing or supplying electricity, whether registered or unregistered.

'electric line' means a conductor used for the purpose of transmitting, distributing or supplying electricity with any casing, coating, covering, tube, pipe, pole, post, frame, bracket or insulator enclosing, surrounding or supporting the conductor or any part of the conductor or any apparatus connected in conjunction with the conductor for the purpose of transmitting, distributing or supplying electricity.

'fire control authority' means--

(a) the Metropolitan Fire Brigades Board, if the area is within the metropolitan fire district; or

(b) the Secretary of the Department of Natural Resources and Environment, if the area is within a state forest, national park or protected public land; or

(c) the Country Fire Authority, if the area is within the country area of Victoria within the meaning of the Country Fire Authority Act 1958.

'hazard space' means the space outside the clearance space and regrowth space in which trees or limbs due to their unsafe condition are a potential hazard to the safety of a powerline under the range of weather conditions that can reasonably be expected to prevail.

'insulated service cable' means a low voltage, multi-core cable insulated by a medium other than an air space as defined in Australian Standard AS 3000-1991 - SAA Wiring Rules and used for the purpose of conveying electricity through a service line.

'low voltage' means voltage exceeding 32V a.c. or 115V d.c. but not exceeding 1000V a.c. or 1500V d.c.

'Minister' means the Minister responsible for administering the Act.

'occupier' in relation to land, means a person who is in actual occupation of the land or if no-one is in actual occupation of the land, the owner of the land.

'overhead' in relation to a powerline, means a powerline which is above ground level.

'plantation' means any part of a road or a reserve of a road which is planted with one or more trees.

'point of supply' in relation to a private electric line above or below the surface of land means--

(a) in the case of an underground powerline, the point where that line crosses the boundary of the land; and

(b) in the case of an overhead powerline, the first point of connection of that line on the land, being either--

(i) where the line is carried onto the land by one or more poles, the first pole on that land carrying the line;

(ii) where the line is connected directly to premises on the land, that connection to the premises; or

(iii) where it is not possible to determine a point of supply in accordance with subparagraph (i) or (ii), the point at which the line crosses the boundary of the land--

unless the line is connected to Commission assets which are situated on an easement vested in the Commission or an electricity corporation which is on the land in which case the point of supply shall be the point at which the line is connected to Commission assets.

'powerline' means an electric line which ordinarily operates at a voltage of 66,000 volts or less; however it does not include telecommunication cables.

'powerline clearance' means the distance between vegetation and the nearest component of a powerline designed for the conveying transmitting or distributing of electricity under normal operating conditions.

'Powerline Clearance Consultative Committee' means the committee established by section 63 of the Act.

'private electric line' means any overhead or underground low voltage electric line used to take energy from the point of supply, whether or not that line is vested in the Commission or an electricity corporation.

'public land' means--

(a) Crown land;

(b) land vested in any Minister of the Crown;

(c) land vested in any public statutory authority or council; or

(d) land (whether privately or publicly owned) used for public purposes.

'regrowth space' means the space beyond the clearance space that must be cleared to allow for anticipated vegetation regrowth in the period between pruning or clearing.

'responsible person' means a person responsible under section 60 of the Act for the maintenance of a private electric line or for the keeping of the whole or any part of a tree clear of an electric line.

'rural area' means an area which is not an urban area.

'service line' means the terminating span of an electric line--

(a) constructed or designed or ordinarily used for the supply of electricity at low voltage; and

(b) through which electricity is, or is intended to be, supplied by a distribution company to a point of supply.

'urban area' means--

(a) an area of land which is predominantly--

(i) subdivided into allotments or lots which in the case of land used or to be used for residential purposes are not greater than 0.4 hectares; and

(ii) able to be used or developed under a planning scheme for residential, industrial or commercial purposes; and

(iii) provided with constructed streets and public utility services; and

(iv) provided with street lighting which is installed at not less than three lanterns in every 500 metres; or

(b) any other area specified in a notice by the Minister published in the Government Gazette specifying any area of land as an urban area.

NOTE: Any reference to the Commission in this document means distribution company.

3 Principles of Maintaining Clearance

3.1 General

There are a number of methods of maintaining clearance between powerlines and vegetation and currently the most common method is pruning and clearing of vegetation. Other methods include:

(a) using construction methods such as underground powerlines;

(b) selecting powerline routes which avoid vegetation;

(c) using engineering solutions, for example, taller poles for low growth vegetation areas;

(d) planting appropriate vegetation species; and

(e) using insulated cables such as aerial bundled cable to reduce the clearance space required between powerlines and vegetation (refer section 4.3).

Factors determining the most appropriate method of maintaining clearance between powerlines and vegetation include:

(a) minimisation of the potential risk to the public;

(b) cost;

(c) community conservation values; and

(d) the type of vegetation and its growth characteristics.

The cost of each method and any recurrent savings from avoided clearing and pruning will vary significantly from place to place because of the nature of the ground conditions, topography, the density of vegetation and climate.

Interested persons can negotiate conditions for alternatives with the responsible person and the owner of the powerline.

3.2 Vegetation Management

Where pruning or clearing of vegetation is necessary, effective management procedures, trained and skilled personnel and pruning practices to recognised industry standards, such as Australian Standard AS4373-1996 - Pruning of Amenity Trees, are essential.

A person carrying out pruning or clearing of vegetation which may contact powerlines must hold a current certificate certifying satisfactory completion of a training course, approved by the Chief Electrical Inspector. Management procedures for the training and accreditation of personnel in pruning or clearing practices (refer section 8.4.2) will require the endorsement of the Chief Electrical Inspector in management plans.

Correct pruning practices can discourage regrowth towards the powerline and reduce:

(a) the frequency of pruning;

(b) the likelihood of disease and decay; and

(c) the risk of vegetation becoming a hazard to the public and the powerline

while maintaining the integrity, amenity and utility of the vegetation.

Note.
Appendix A furnishes a list of bodies and institutions which can assist with information on correct pruning practice.

The management procedures to be employed and performance objectives are set out in section 8.

To provide a consistent and measurable approach to pruning or clearing vegetation near powerlines and to assist people to understand these practices, the following basic terms and concepts apply:

(a) Clearance Space

Clearance space means a space surrounding a powerline which must be clear of vegetation at all times.

The clearance space varies with the type of powerline installed and the risk of the ignition of fire at that location (refer sections 4.2 and 4.3). The clearance space is designed to provide fire safety in rural areas and other areas with moderate to high fire hazard ratings and reliability and continuity of electricity supply. The dimensions of the clearance space have been determined following consideration of the effect of adverse environmental and weather conditions (refer section 4.4).

(b) Regrowth Space

Regrowth space means the space beyond the clearance space that must be cleared to allow for anticipated vegetation regrowth in the period between pruning or clearing.

The regrowth space required varies with the species of vegetation, the quality of the pruning or clearing, the micro environment and the frequency of pruning or clearing. Determining the regrowth rate is a matter of considering the factors involved. It should be assessed with the support of expert knowledge in vegetation management and following consultation with affected persons. Vegetation which will never grow into the clearance space should not be removed.

(c) Hazard Space

Hazard space means the space outside the clearance space and regrowth space in which trees or limbs due to their unsafe condition are a hazard to the safety of a powerline under the range of weather conditions that can reasonably be expected to prevail.

Such vegetation is generally unstable and could fall on the powerline and therefore requires removal or other remedial action.

(d) Pruning or Clearing Cycles

This is the frequency of successive pruning or clearing which the responsible person judges as optimal for maintaining clearance between powerlines and vegetation. It is based on practical factors including regrowth rate, the size of the clearance and regrowth space, fire risk, recurrent costs, and conservation considerations.

For the purposes of the Code, in most situations a cycle of three years is currently considered optimal.

3.3 Suitable Vegetation Species

In some situations vegetation cannot be pruned to the requirements of the Code in successive cycles without destroying the vegetation's character, amenity and utility value or encouraging vigorous regrowth. In the longer term this could cause the vegetation to become unstable, unhealthy and a hazard to the public and the powerline. This vegetation should be removed where judged appropriate following assessment of the vegetation's conservation value. Replacement with a suitable species should be considered.

As a general rule, species with a mature height greater than 3.5 metres should not be planted under powerlines.

Saplings whose mature height will infringe the clearance space are best removed at an early stage of their growth to minimise cost and disruption to the area in the future.

Planting suitable species will remove the potential risk to powerlines and the need for costly recurrent pruning or clearing as well as retaining the amenity and utility value of vegetation to the public and environment.

Note.
Appendix A furnishes a list of bodies and institutions which can assist with information on suitable vegetation species.

3.4 Important Vegetation

Locations recognised by relevant authorities or bodies as containing the following important vegetation require special attention:

(a) botanically, historically or culturally important vegetation;

(b) vegetation of outstanding aesthetic or ecological significance; and/or

(c) the habitat of rare or endangered species.

The responsible person must identify where the maintenance of clearances between powerlines and vegetation will be detrimental to important vegetation.

Note.
Appendix B furnishes a list of bodies and organisations which can assist in determining sites of important vegetation.

Alternative powerline routes or construction methods may help to conserve the above (refer also to section 9 - Areas of Particular Significance). How this may be done needs to be decided in consultations between the distribution company, any other responsible person and the body responsible for the vegetation in order to form an agreement on the most practical management arrangements and conditions that may apply. Any agreement reached must not contravene the provisions of the Flora and Fauna Guarantee Act 1988.

The Powerline Relocation Committee has been established to consider and, where appropriate, subsidise alternative routes or construction methods which will preserve areas of environmental or historic importance. In appropriate circumstances the Committee should be approached to share the cost of environmentally effective alternatives with the proponent.

Note.
The Powerline Relocation Committee can be located at the Department of Treasury and Finance, 1 Treasury Place, Melbourne.

4 Powerline Clearance Standards

4.1 General

The necessary standards for the dimensions of the clearance space are determined by the location in which powerlines are situated and factors associated with the type of powerline installed.

4.2 Category 1 and Category 2 Areas

4.2.1

The risk of fire starting and spreading varies throughout Victoria. To establish the clearance space required, Victoria has been divided into two categories in which different clearance space dimensions apply:

(a) category 1 areas (predominantly urban); and

(b) category 2 areas (predominantly rural).

(Refer to Tables 1, 2 and 3).

Note.

Refer to section 2 for the definitions of category 1 and category 2 areas and section 5 for the relevant responsible persons. Municipal councils are generally responsible for most of category 1 areas, while distribution companies are generally responsible for the remaining areas.

4.3 Powerline Factors Affecting Dimensions of Powerline Clearance

The dimensions of the clearance space are also dependent on factors associated with the type of powerline and include:

(a) powerline voltage--
the voltage level of the powerline influences the potential for electric discharge. The higher the voltage the greater the potential and hence the need for a greater clearance space.

(b) powerline construction--
insulating powerline conductors reduces the risk of electric discharge. Using aerial bundled cable or other insulated conductors reduces the necessary dimensions of the clearance space.

(c) distance between powerline poles--
as the distance between powerline poles (span length) increases, the added weight of the powerline conductors causes an increase in powerline sag. Powerline conductors can sway with the wind, therefore all dimensions of the clearance space must be greater as the distance between poles increases.

Note.

1. *Sag in long spans can be more than 10 metres.*
2. *For further information on sag and sway of powerline conductors refer to Appendix C.*

(d) distance along the powerline conductors from the pole--
along the powerline conductors the greatest sag occurs midway between the supporting poles (on level ground). Therefore the dimensions of the clearance space must be greater in the centre region of the span than near the pole (refer Figure 1).

(e) temperature of the powerline conductors--
increases in the temperature of powerline conductors, caused by weather and the amount of electricity being carried, increases the sag of the conductors. These factors are in a state of continual change, so an allowance is made in the dimensions of the clearance space for the temperature of powerline conductors.

4.4 Clearance Space Dimensions

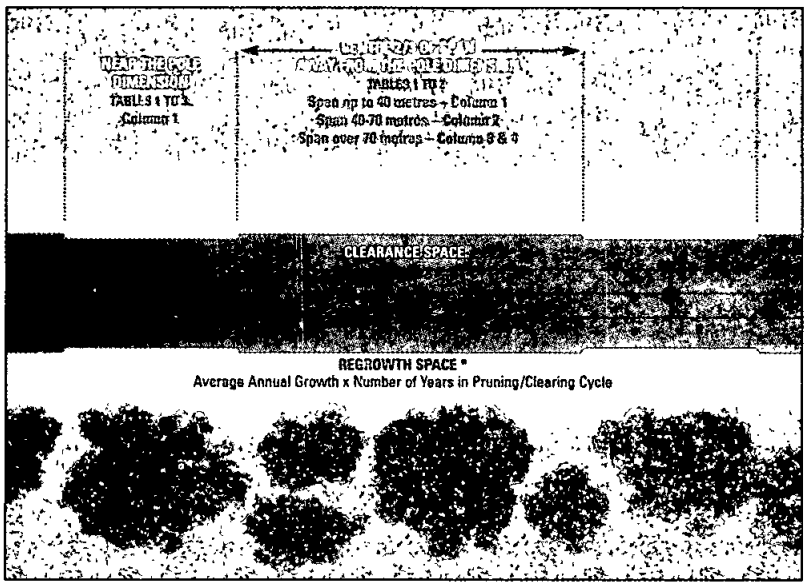
(a) the dimensions of the clearance space **for all areas** and for all operating voltages of powerlines constructed with **aerial bundled cable and insulated service cable** are those prescribed in **Table 1** of this Code. For category 1 areas only, the clearance space for aerial bundled cable near the pole as specified in column 2 of Table 1 may be reduced where tree trunks and limbs near the aerial bundled cable present no risk of abrasion. For category 1 areas only, the clearance space between aerial bundled cable and foliage may also be reduced to allow foliage which has insufficient strength to abrade the cable in the period between pruning to remain in contact with the aerial bundled cable.

(b) the dimensions of the clearance space for **category 1 areas**, for powerlines other than those constructed with aerial bundled cable and insulated service cable and for the operating voltages given are those prescribed in **Table 2** of this Code.

(c) the dimensions of the clearance space for **category 2 areas**, for powerlines other than those constructed with aerial bundled cable and insulated service cable and for the operating voltages given are those prescribed in **Table 3** of this Code.

Figure 1 ALL CATEGORIES: PLAN VIEW OF AN OVERHEAD POWERLINE

Showing the Clearance Space and Regrowth Space.
Applies to all types of overhead powerlines.
The powerline shown represents a bare conductor type.



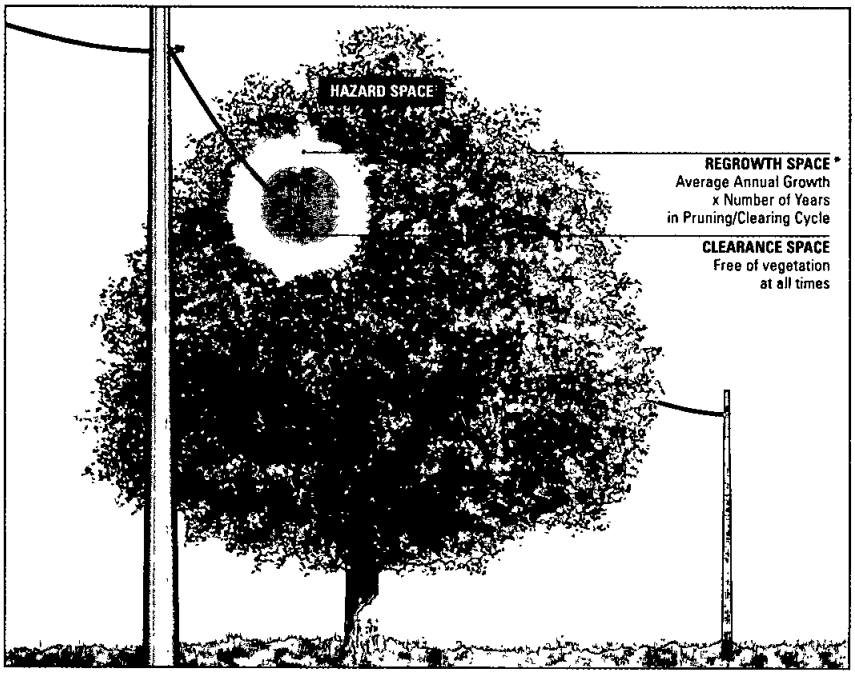
*REGROWTH SPACE shown is indicative only. It will vary with species, climate, soil conditions and other factors. *Refer Section 3.* NOT TO SCALE

Table 1 Category 1 and Category 2 Areas
Aerial Bundled Cable and Insulated Service Cable
Dimensions of Clearance Space From a Still Cable

Type of Powerline	Near pole	Away from pole			
	All spans	Span of up to 40 metres	Span of 40-70 metres	Span of over 70 metres	
	In all directions	In all directions	In all directions	Vertically above & below	Horizontally
Aerial bundled cable	0.3 m	0.3 m	0.6 m	0.9 m	0.9m
Insulated service cable	0.6 m	0.6 m	1.0 m	1.0 m	The greater of 1.5 x sag or 1.0 m

Figure 2 CATEGORY 1 AND CATEGORY 2 AREAS

Aerial Bundled Cable and Insulated Service Cable

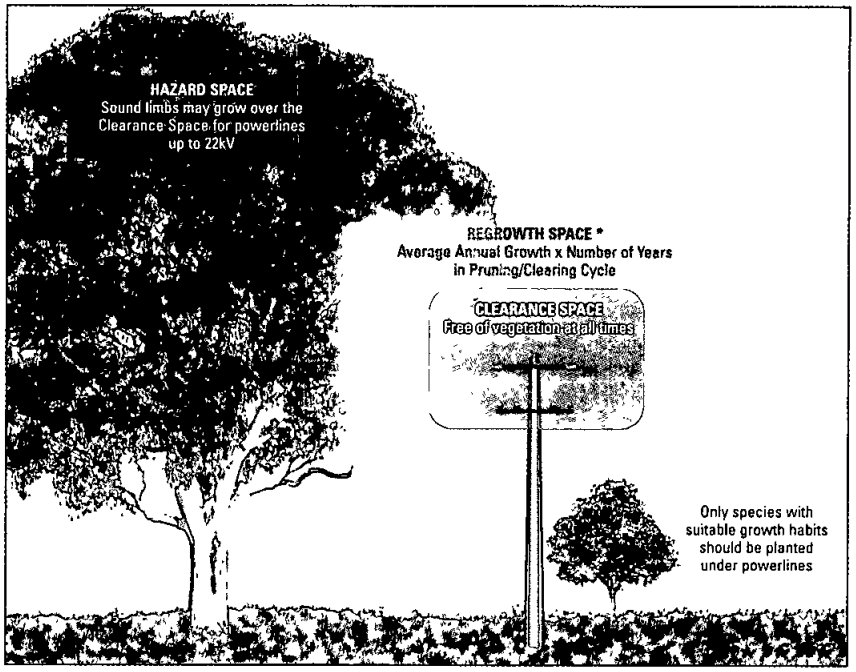


*REGROWTH SPACE shown is indicative only. It will vary with species, climate, soil conditions and other factors. *Refer Section 3.* NOT TO SCALE

Table 2 Category 1 Areas
Other Than Aerial Bundled Cable and Insulated Service Cable
Dimensions of Clearance Space From a Still Powerline Conductor

Type of Powerline	Near pole	Away from pole			
	All spans	Span of up to 40 metres	Span of 40-70 metres	Span of over 70 metres	
	Vertically & horizontally	Vertically & horizontally	Vertically & horizontally	Vertically	Horizontally
Insulated low voltage	0.3 m	0.3 m	0.6 m	0.6 m	**The greater of** 1.5 x sag or 0.6 m
Bare low voltage	1.0 m	1.0 m	1.5 m	1.5 m	**The greater of** 1.25 x sag + 0.5 m or 1.5 m
Bare 6.6kV, 11kV, 22kV	1.5 m	1.5 m	2.0 m	2.0 m	**The greater of** 1.25 x sag + 0.5 m or 2.0 m
66kV	2.25 m	2.25 m	3.0 m	3.0 m	**The greater of** 1.5 x sag + 1.0 m or 3.0 m

Figure 3 CATEGORY 1 AREAS

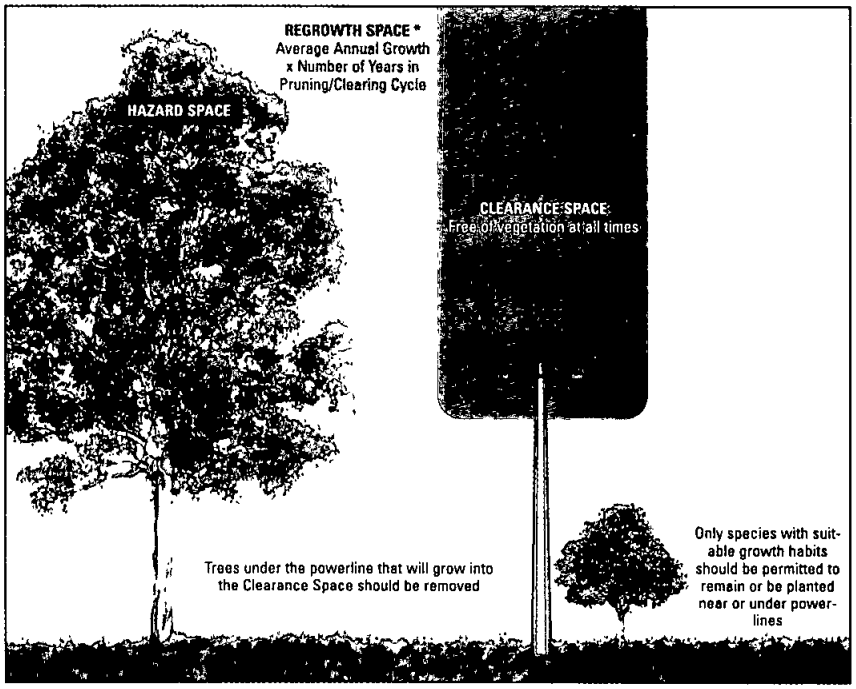


*REGROWTH SPACE shown is indicative only It will vary with species, climate, soil conditions and other factors *Refer Section 3.* NOT TO SCALE

Table 3 Category 2 Areas
Other Than Aerial Bundled Cable and Insulated Service Cable
Dimensions of Clearance Space From a Still Powerline Conductor

Type of Powerline	Near pole	Away from pole			
	All spans	Span of up to 40 metres	Span of 40-70 metres	Span of over 70 metres	
	Vertically below & horizontally	Vertically below & horizontally	Vertically below & horizontally	Vertically below	Horizontally
Insulated low voltage	0.6 m	0.6 m	1.0 m	1.0 m	**The greater of** 1.5 x sag or 1.0 m
Bare low voltage	1.5 m	1.5 m	2.0 m	2.0 m	**The greater of** 1.25 x sag + 0.5 m or 2.0 m
Bare 6.6kV, 11kV, 22kV	1.5 m	1.5 m	2.0 m	2.0 m	**The greater of** 1.25 x sag + 0.5 m or 2.0 m
66kV	2.25 m	2.25 m	3.0 m	3.0 m	**The greater of** 1.5 x sag + 1.0 m or 3.0 m

Figure 4 CATEGORY 2 AREAS



*REGROWTH SPACE shown is indicative only It will vary with species, climate, soil conditions and other factors *Refer Section 3.* NOT TO SCALE

Notes Relating to the Tables

1. All dimensions given in the Tables are from a powerline conductor in still air and account for the sag and sway of the conductor as well as the anticipated "whip" of trees in high winds (50 km/hr). However, for slender vegetation species and other unique situations additional allowances may be necessary.
2. In category 1 areas, allowing limbs and foliage to grow over the powerline from adjacent vegetation is strongly discouraged but healthy and stable limbs may remain as shown in Figure 3 provided the tree is not readily climbable and the voltage of the powerline does not exceed 22,000 volts. In category 2 areas this is not permitted as shown in Figure 4.
3. For aerial bundled cable and insulated service cable the clearance space can generally be in the form of a circle for all areas.
4. For locations of important vegetation, the distribution company may, in lieu of the vertical dimensions shown in Tables 2 and 3 and following inspection, calculate a reduced dimension to be applied vertically below the powerline conductors for particular span lengths. This dimension will be comprised of a conductor sag under determined conditions of ambient temperature and electrical current and a margin for safety. The distribution company must include in its management plan procedures for recording such locations and the validation of determined values over time.
5. For spans greater than 350 metres, individual calculations may be required that alter clearances required by Table 3. These calculations may increase the clearances "near the pole" and reduce the clearances "away from the pole".

5 The Responsible Person

5.1 General

Section 60 of the Act makes particular persons and bodies responsible for maintaining clearance between powerlines and vegetation (responsible person). Section 62 of the Act enables a distribution company to carry out the necessary work where a responsible person defaults.

The Act declares the following to be a responsible person:

5.2 An Occupier of Land

Under section 60(1) of the Act an occupier of land above or below the surface of which there is a private electric line shall be responsible for the maintenance of the line. Under section 60(2) of the Act an occupier of land shall be responsible for the keeping of the whole or any part of a tree situated on the land clear of--

(a) a low voltage electric line which solely services the land he occupies; and

(b) a private electric line which is contiguous to the land he occupies and for this purpose he may enter onto the land and there perform any acts necessary to keep the tree clear of the line.

Note.

In summary, an occupier of land is responsible for:

(a) keeping the occupier's vegetation clear of private lines on the occupier's own land;

(b) keeping the occupier's vegetation clear of private lines on contiguous (adjoining) land; and

(c) keeping the occupier's vegetation clear of low voltage lines solely servicing the occupier's land.

5.3 Municipal Councils and Others Responsible for Public Land

Under section 60(3) of the Act municipal councils or any other body responsible for the management of public land in a declared area is responsible for the keeping of the whole or any part of a tree situated on the land clear of an electric line.

Note.
Refer to section 2 for the definition of declared area.

5.4 Roads Corporation

Under section 60(4) of the Act the Roads Corporation is responsible for the keeping of the whole or any part of a tree which is situated on a plantation on a road declared to be a road by the Minister administering the Transport Act 1983 under Schedule 5 to the Transport Act 1983 (other than a main road) clear of an electric line above or below the surface of land in a rural area.

5.5 Others

Under section 60(3A) of the Act any person (other than a distribution company) who owns or operates an electric line--

(a) pursuant to an Order under the Electric Light and Power Act 1958; or

(b) with the permission of the Chief Electrical Inspector under section 6(1) of the Electric Light and Power Act 1958; or

(c) pursuant to an Act of Parliament--

is responsible for the keeping of the whole or any part of a tree clear of the electric line.

5.6 A Distribution Company

5.6.1

Under section 60(5) of the Act if there is no other responsible person under sub-section (2), (3), (3A) or (4) the relevant distribution company is responsible for the keeping of the whole or any part of a tree clear of an electric line except an electric line erected by a person pursuant to an Act of the Commonwealth. This could include:

(a) public land in rural areas;

(b) public land in urban areas which are not declared areas;

(c) powerline easements;

(d) places where vegetation growing on private land may grow into the powerlines on public land or powerline easements; and

(e) places where vegetation growing on private land may grow into the service line crossing the land for the purpose of supplying electricity to the contiguous (adjoining) land.

5.6.2

A distribution company may require the responsible person (by notice in writing) to undertake works within a specified period to keep vegetation clear of powerlines, including private electric lines, under section 62 of the Act.

5.6.3
Where a responsible person fails to meet the requirements of the notice the distribution company may perform any work necessary and recover costs, subject to requirements under section 62 of the Act.

6 Duties of the Responsible Person

6.1 General

Common duties apply to every person declared to be a responsible person and additional duties are imposed on particular responsible persons as set out below. How a responsible person will carry out their duties is set out under management procedures in section 8.

6.2 Duties in Common

A responsible person must:

(a) keep the relevant clearance space prescribed in section 4.4 free of vegetation at all times; and

(b) decide which method to adopt to ensure that the clearance space remains free of vegetation; and

(c) if the method adopted is pruning or clearing, determine the regrowth space, hazard space and the frequency of pruning or clearing; and

Notes.

1. *Options available and matters for consideration when evaluating alternative methods are discussed in section 3.1.*
2. *While the responsible person must decide how to maintain clearance between powerlines and vegetation this does not preclude persons from negotiating conditions under which other solutions may be used.*
3. *Factors influencing regrowth space, hazard space and the frequency of pruning or clearing are discussed in section 3.2.*

(d) ensure that the pruning or clearing is done responsibly; and

Note.
Refer section 3.2

(e) give special attention to how the clearance space is maintained in locations of important vegetation.

Note.
Refer section 3.4

6.3 Occupiers of Land - Additional Duties

An occupier of land with service lines, private electric lines or land which adjoins land with private electric lines must monitor the clearance between the powerline and vegetation to ensure the clearance space is free of vegetation at all times.

Notes.

1. *The frequency of inspections to monitor powerline clearances is dependent on growth characteristics of the vegetation and local growing conditions.*

2. *If any doubt exists about the frequency of inspection or the works necessary to maintain the clearance space expert advice from persons such as arboriculturalists, registered electrical contractors or other suitably trained contractors may be obtained.*

3. *It may be necessary for the private electric line to be de-energised to undertake the works.*

4. *The advice of a distribution company may be sought where doubt still exists about the safety of the works or for assistance in selecting suitable species for planting near the powerline.*

6.4 Municipal Councils and the Roads Corporation - Additional Duties

Municipal councils and the Roads Corporation must:

(a) consult the relevant distribution company whenever there is doubt about the safety of pruning or clearing activities near powerlines prior to commencing such pruning or clearing activities; and

(b) dispose of any debris resulting from emergency pruning undertaken by the distribution company and for which municipal councils or the Roads Corporation have been notified (refer section 6.6).

6.5 Distribution Company - Additional Duties

Distribution companies have additional duties because they own the majority of powerlines, have expert knowledge of powerlines and are responsible for maintaining clearance between powerlines and vegetation where the ownership of the vegetation is vested in others.

6.5.1

A distribution company has a duty to assist the responsible person and the public. A distribution company must:

(a) assist a responsible person in identifying locations where attention will be required to maintain the clearance space required in accordance with this Code. (For private electric lines this duty is limited to lines between the point of supply and the first building/s connected to the line); and

(b) assist a responsible person and the public to ensure that pruning or clearing activities can be undertaken safely; and

Note.
This may require a distribution company to de-energise powerlines, do preliminary pruning to enable safe access, or take other precautions to ensure the safety of those working near the powerline.

(c) assist a responsible person and the community, when requested, in:
   (i) setting safe limits of approach to powerlines for pruning or clearing activities;
   (ii) establishing safe methods for removing vegetation near powerlines;
   (iii) obtaining advice on vegetation species and their growth habits; and
   (iv) finding information on suitable vegetation species for planting near powerlines; and

Note.
It is in the interest of a distribution company to ensure that vegetation near powerlines and pruning or clearing activities do not interfere with the fire safety or reliability of a powerline. Accordingly, a distribution company should ensure that advice and information are readily available to the responsible person and the public.

(d) assist the community in fire prevention by being a contributing member of council meetings held in the performance of duties of councils under the Country Fire Authority Act 1958; and

(e) inform affected persons of the distribution company's processes to negotiate alternative powerline construction arrangements to avoid or reduce the need for pruning or clearing and the conditions that will apply to such arrangements.

6.5.2
A distribution company has a duty to consult, notify and negotiate. A distribution company must:

(a) notify affected persons, giving reasonable notice, before starting programmed pruning or clearing. (Notices should be informative, explaining why compliance with this Code is essential. Where no-one is in actual occupation of the land, notices to landowners with regard to pruning or clearing on adjoining land which affects the use of the landowner's land may be published in locally distributed newspapers); and

(b) consult with affected persons when the proposed pruning or clearing will change from the established practice for that location; and

(c) negotiate with affected persons to achieve satisfactory arrangements for:
   (i) access to easements;
   (ii) use of chemicals;
   (iii) disposal of debris resulting from pruning or clearing;
   (iv) complete removal of vegetation; and
   (v) construction of new powerlines or the extension or significant reconstruction of existing powerlines.

Note.
1. *When using chemicals due care must be observed to preserve public safety and quality assurance schemes such as Farm Quality Assurance Programs.*
2. *The planning process for new powerlines must provide sufficient time to consider the alternatives for maintaining clearance between the powerline and vegetation and the negotiation of any conditions which may apply to the granting of an easement, planning authority requirements or alternatives requested by affected persons.*

6.6 Emergency Clearing
6.6.1
In emergency situations, the distribution company may remove vegetation which poses an immediate risk.

6.6.2
Under such circumstances, pruning may be undertaken without consulting affected persons where this is not practical, but the distribution company must notify affected persons as soon as practicable after the removal of the vegetation.

6.7 Disputes

6.7.1
Disputes with affected persons may arise from decisions made by a responsible person in carrying out his or her duties. The responsible person must endeavour to resolve any dispute with affected persons in accordance with the dispute resolution processes contained in the responsible person's management plan.

6.7.2
A responsible person must make its dispute resolution processes available to interested parties as a public document.

6.7.3
If this process fails to resolve the dispute the matter may be referred to the Chief Electrical Inspector who will decide on a mechanism for resolving the matter.

6.7.4
Notwithstanding the nature of the dispute and the need to resolve the dispute in an amicable manner, the duty of the responsible person to maintain the clearance space at all times cannot be compromised.

7 Management Plans

7.1 Duty to Have a Management Plan

A responsible person, other than a responsible person under section 5.2, must have an endorsed management plan which incorporates the procedures for carrying out his or her duties (refer section 8).

7.2 Endorsement of Management Plans

7.2.1
Management plans must be submitted to the Chief Electrical Inspector for endorsement that the management plans and procedures fulfil the purpose of the Code and its objectives.

7.2.2
The plans and procedures will be reviewed annually on a date to be advised by the Chief Electrical Inspector.

7.3 Content of Management Plans

Management plans must include (where applicable):

(a) a corporate mission statement identifying the goals and objectives of the plan;

(b) a corporate vision statement outlining the responsible person's:
   (i) long term strategies to minimise the risk of powerlines starting fires and the adverse effects of powerlines on the vegetation; and
   (ii) commitment to the ongoing development of fire safe powerlines;

(c) a management structure for carrying out the responsible person's duties and responsibilities, which identifies where particular responsibilities and accountabilities lie;

(d) management procedures to be employed in carrying out duties, including dispute resolution processes;

(e) measures and audit processes to be employed to evaluate the propriety and application of procedures in fulfilling the purpose of the Code and meeting the Code's objectives; and

(f) processes to identify non-conformities and how to institute corrective actions.

8 Management Procedures

8.1 General

8.1.1

The Code, rather than being prescriptive, describes performance objectives for management procedures in the introduction of the Code. This is to encourage management procedures specific to local needs.

8.1.2

The measure of compliance for this requirement of the Code will be management procedures as part of a responsible person's management plan (with the exception of a responsible person under section 5.2 of the Code). The Chief Electrical Inspector may audit compliance by the responsible person with the responsible person's management procedures.

The following management procedures must be included in the management plan as a minimum requirement:

8.2 Method of Maintaining Clearance Between Powerlines and Vegetation

8.2.1

A responsible person must choose the most appropriate method of maintaining clearance between powerlines and vegetation (refer sections 3.1, 6.2(b) and 6.2(c)).

8.2.2

A responsible person must have management procedures for:

(a) assessing the effect of alternative methods on potential risk to the public;

(b) assessing and costing alternative methods;

(c) evaluating recurrent savings achieved through avoided costs; and

(d) assessing the conservation value of affected vegetation.

8.3 Maintenance of the Clearance Space

The responsible person must keep the clearance space free of vegetation (refer sections 4.4 and 6.2(a)).

A responsible person must have management procedures for:

(a) identifying locations where work will be required to maintain the clearance space;

(b) maintaining the clearance space free of vegetation at all times;

(c) establishing the dimensions of the regrowth space and pruning cycles; and

(d) ensuring the hazard space is free of foreseeable hazards.

8.4 Responsible Pruning Practices

8.4.1

A responsible person must prune or clear vegetation responsibly (refer section 6.2(d)). Pruning and clearing must be done safely by trained, skilled and knowledgeable persons who can recognise hazards and care for the health and appearance of vegetation.

8.4.2

A responsible person must have management procedures for:

(a) training and accreditation of all relevant personnel and contractors to recognised industry standards; and

(b) monitoring that pruning and clearing is done to recognised industry standards.

8.5 Important Vegetation

8.5.1

A responsible person must give special consideration to important vegetation (refer section 6.2(e)).

8.5.2

A responsible person must have management procedures for:

(a) identifying and recording the location of important vegetation;

(b) consulting with those responsible for important vegetation; and

(c) evaluating and analysing alternative solutions.

8.6 Distribution Company Assistance to the Responsible Person and the General Public

8.6.1

A distribution company must assist responsible persons in carrying out their duties and provide advice to the public about vegetation near powerlines (refer section 6.5.1).

8.6.2

A distribution company must have management procedures for:

(a) establishing formal working relationships with the responsible person;

(b) coordinating and rationalising activities with responsible persons to achieve optimal efficiency in carrying out necessary works;

(c) assisting responsible persons to identify places where pruning or clearing will be required;

(d) ensuring that notified pruning or clearing to maintain the clearance space on private electric lines is undertaken;

(e) assisting responsible persons to ensure pruning or clearing activities near powerlines can be done safely;

(f) assisting responsible persons and the public with access to advice and information for planning, planting and maintenance of vegetation near powerlines; and

(g) informing affected persons of the processes to negotiate conditions for alternative construction arrangements.

8.7 Consultation, Notification and Negotiation

8.7.1

A distribution company must notify and where appropriate consult and negotiate with persons affected by pruning or clearing activities (refer section 6.5.2).

8.7.2

A distribution company must have management procedures for:

(a) determining who should be notified and/or consulted;

(b) giving reasonable notice of programmed pruning or clearing;

(c) consulting where pruning practices change;

(d) negotiating arrangements for property access, use of poisons and removal of debris;

(e) resolving disputes; and

(f) consulting and negotiating requirements when planning new powerlines or the extension or significant reconstruction of existing powerlines.

9 Areas of Particular Significance

9.1 General

An area of particular significance is one in which special arrangements are made to vary the normal applications of this Code. Such areas may only be treated in this fashion after the Minister has determined them as areas of particular significance and they are recorded on the register maintained by the Office of the Chief Electrical Inspector. Information contained in this register is available during office hours on request to the Office of the Chief Electrical Inspector.

In determining any area, the Minister would normally impose special conditions designed to ensure that the fire safety of the area is not reduced as a result of the determination. The following are examples of special conditions which may be specified:

(a) specialised tree pruning, clearing or planting requirements;

(b) annual removal of regrowth;

(c) reduction of ground level combustible materials;

(d) the use of special construction techniques; or

(e) other special requirements appropriate to the circumstances.

9.2 Procedure for Identification of Areas of Particular Significance

9.2.1

For an area to be determined as an area of particular significance for the purpose of this Code the proponent must establish that the area meets criteria set down in section 9.3 and that an effective alternative management plan has been agreed between the proponent, the municipalities involved, the Country Fire Authority and the distribution company which will not result in any appreciable increase in the risk of fire ignition in the area.

9.2.2
It is essential that the qualities or features typified by the relevant criteria must be placed at significant risk by the application of the normal provisions of this Code.

9.2.3
As the work of producing the management plan and the supporting information detailed in section 9.4 may be considerable, a two-stage process may be used whereby the environmental grounds for the determination of an area are submitted for consideration as a first stage. Following an assessment of the environmental value of the area, the work of preparing and submitting the management plan may then be commenced as a second stage.

9.2.4
The boundaries of the area proposed for determination must be identified clearly on an appropriate map. Likewise, where sub-areas are proposed for the purpose of identifying separate management strategies, their boundaries must be defined clearly.

9.2.5
The area should not be so small that its purpose is to protect a local feature which could be protected more appropriately by a process of consultation between the proponent and the local distribution company as a location of important vegetation.

9.2.6
Before preparing a proposal, it is recommended that the Office of the Chief Electrical Inspector be consulted.

9.3 Environmental Criteria to be Met

9.3.1
An area proposed for determination must satisfy at least one of the following criteria:

(a) the area is an outstanding example of natural or exotic vegetation;

(b) the area is one which contains rare or endangered plant or animal species or communities or provides a demonstrated flora or fauna corridor for these species or communities;

(c) the area is a significant part of an outstanding complex of areas or landscape categories. In this context each individual part of the complex may not necessarily be in itself "outstanding" but the bringing together of those parts into the complex as a whole presents overall qualities which then meet the requirement to be judged "outstanding". These landscape categories may include landscapes which are significant by virtue of their historic or cultural connotations, their vegetation or their architectural characteristics; or

(d) it is a specific area which has special tourism potential, attraction or amenity.

9.3.2
A proposal shall set out the manner in which one or more of the criteria listed are met, together with objective documentary evidence in support.

9.3.3
Appendix B lists bodies and organisations which can assist when preparing a justification of the environmental value of the area proposed in relation to the list of criteria.

9.4 Fire Risk Reduction Measures to be Applied in Category 2 Areas

9.4.1
Special fire risk reduction measures which are recommended to the Minister for application to the area or a sub-area as an alternative to those required by the Code for category 2 areas (refer section 2) must be set out in detail in a proposal.

9.4.2
While it is desirable that the conditions or requirements apply uniformly to the area, it is recognised that, in some situations, this may be inappropriate. In such cases, separate conditions or requirements should be specified for each sub-area within the total area.

9.4.3
It is essential that adequate powerline clearances are maintained in all directions from each bare powerline conductor. Except where a particular clearance has been calculated by the distribution company having regard to the local circumstances, the clearances must be those designated in Table 3.

9.4.4
A frequent exemption desired in proposed areas is the retention of tree limbs overhanging powerlines other than aerial bundled cable in areas where the requirements for the category 2 clearance space would normally apply. In these situations it is essential that other arrangements have been made to ensure that the retention of the overhanging limbs does not increase the risk of fire ignition. Arrangements could include a means by which any accumulation of ground level combustible materials may be prevented. Reliance on such methods may however prove impractical because ground cover reduction may be more environmentally damaging than the vegetation pruning being avoided.

9.4.5
Where suitable fire risk reduction arrangements have been made limbs may overhang powerline conductors provided all the following conditions are satisfied:

(a) adequate powerline clearances are maintained in all directions from each bare powerline conductor;

(b) the tree is of sound health and vigour and has good structural integrity;

(c) overhanging limbs do not exhibit visible defects; and

(d) the species is not particularly prone to shedding limbs.

9.4.6
Where there is a disagreement with the opinion of the distribution company as to whether a particular tree qualifies for its limbs to overhang a line, the opinion of a suitably qualified and experienced person appointed by the distribution company shall be final.

9.4.7

The proposal on fire risk reduction measures must include:

(a) the proposed special conditions or requirements to be imposed upon the area to ensure that fire safety is not compromised;

(b) the documented fire history of the area which may be obtained from the Department of Natural Resources and Environment in respect of state forest, national parks and protected public land or through the Municipal Fire Prevention Officer for other areas;

(c) the documented history of tree/powerline interactions in the area (available from the distribution company);

(d) documented evidence of comments from the municipality or municipalities affected by the proposal including municipalities in proximity to the area. This evidence shall include comments on any costs the municipalities may be called upon to bear for alternative management practices to comply with this section;

(e) how the proposal accords with a distribution company's general strategy for the provision of power within the area (details may be obtained from the distribution company);

(f) documented evidence of comments from parties with an interest in the area. This would include any regional planning authority, the Department of Natural Resources and Environment and the fire control authority. Likewise affected persons or bodies responsible for land adjoining the proposed area must also be consulted and their views documented; and

(g) the implied or actual costs/benefits to the community which would result from the proposal and an indication of how the costs would be financed. As a general rule, the proposal should be as complete as possible, with detailed answers provided to all questions which it raises.

9.5 Submission and Consideration of a Proposal

9.5.1

Proposals for the determination of an area as being one of particular significance may be initiated by municipalities, special interest groups or government bodies. Proposals may also be submitted which recommend alterations to areas determined or even removal of the "particular significance" status from an area should the factors warranting the original determination change significantly.

9.5.2

Once a proposal has been prepared, it must be submitted to the Chief Electrical Inspector, who may in turn forward it to the Minister for consideration.

9.5.3

In assessing a proposal, the Minister would normally seek advice from such parties as the Office of the Chief Electrical Inspector, the distribution company, the Powerline Clearance Consultative Committee and other appropriate sources of expertise depending on the nature of the proposed area and the reasons put forward for its determination.

9.5.4

The areas that are determined by the Minister to warrant classification as being of particular significance will be added to the register maintained by the Office of the Chief Electrical Inspector and would become subject to the special conditions referred to in section 9.1.

Appendix A
List of Bodies and Institutions Which Can Assist With Information on Correct Pruning Practice and the Planting of Suitable Vegetation Species Near Powerlines

Arboricultural Association of Australia Inc
PO Box 5016
ALPHINGTON 3078

Telephone: (03) 9499 8766
Facsimile: (03) 9499 8933

- Advice on tree management and maintenance
- List of qualified and experienced arboricultural contractors

The Centre for Urban Horticulture
VCAH-Burnley
Swan Street
RICHMOND 3121

Telephone: (03) 9810 8800
Facsimile: (03) 9819 1383

- Arboricultural consultancy - arboricultural advice, litigation and tree valuation

CitiPower Pty
Locked Bag 14031
MELBOURNE CITY MAIL CENTRE 8001

Telephone: (03) 9297 8900
Facsimile: (03) 9297 8905

- Referrals and advice on the planting of suitable vegetation species near powerlines

Eastern Energy Ltd
Locked Bag 14060
MELBOURNE CITY MAIL CENTRE 8001

Telephone: (03) 9229 6000
Facsimile: (03) 9229 6001

- Referrals and advice on the planting of suitable vegetation species near powerlines

Powercor Australia Ltd
Locked Bag 14090
MELBOURNE CITY MAIL CENTRE 8001

Telephone: (03) 9679 4444
Facsimile: (03) 9679 4499

Appendix A
List of Bodies and Institutions Which Can Assist With Information on Correct Pruning Practice and the Planting of Suitable Vegetation Species Near Powerlines (continued)

Solaris Power Ltd
Locked Bag 14120
MELBOURNE CITY MAIL CENTRE 8001

Telephone: (03) 9201 7000
Facsimile: (03) 9606 0976

- Referrals and advice on the planting of suitable vegetation species near powerlines

United Energy Ltd
Locked Bag 13
MT WAVERLEY 3149

Telephone: (03) 9222 9222
Facsimile: (03) 9222 9223

- Referrals and advice on the planting of suitable vegetation species near powerlines

Society for Growing Australian Plants Victoria Inc
Liaison Officer
RMB 7242
WANGARATTA 3678

Telephone: (057) 253 270

Natural Resources Conservation League of Victoria
593 Springvale Road
SPRINGVALE SOUTH 3172

Telephone: (03) 9546 9744
Facsimile: (03) 9547 8791

Appendix B
List of Bodies and Organisations Which Can Assist in Determining Sites of Important Vegetation

Municipal Council Offices

- As applicable

Australian Heritage Commission
GPO Box 1567
CANBERRA 2601

Telephone: (06) 217 2111
Facsimile: (06) 217 2095

- The Register of the National Estate, lists sites of natural, historical and aboriginal significance

Department of Infrastructure
Heritage Victoria
477 Collins Street
MELBOURNE 3000

Telephone: (03) 9628 5537
Facsimile: (03) 9628 5650

- Heritage Register (historic buildings, archaeological sites, shipwrecks, designed landscapes, gardens and trees)

The Land Conservation Council
(Reports to) Minister for Conservation and Land Management
477 Collins Street
MELBOURNE 3000

Telephone: (03) 9628 5142
Facsimile: (03) 9628 5080

National Trust of Australia (Victoria)
Tasma Terrace
4 Parliament Place
EAST MELBOURNE 3002

Telephone: (03) 9654 4711
Facsimile: (03) 9650 5397

- Register of Significant Trees Committee, list of registered trees, avenues and stands
- Landscape Committee, which deals with landscapes of particular scientific, cultural and aesthetic value
- Urban Conservation Committee, which deals with historic precincts

Appendix B
List of Bodies and Organisations Which Can Assist in Determining Sites of Important Vegetation (continued)

Department of Natural Resources and Environment
240 Victoria Parade
EAST MELBOURNE 3002

Telephone: (03) 9412 4011
Facsimile: (03) 9412 4540

Note: For general information and referrals, initial contact should be made via local offices.

1. Roadsides Conservation Advisory Committee - roadside vegetation and management plans

   Telephone: (03) 9412 4675
   Facsimile: (03) 9412 4270

2. Flora and Fauna Branch - maintains a register of rare and threatened species and is responsible for the Flora and Fauna Guarantee Act

   Telephone: (03) 9412 4565
   Facsimile: (03) 9412 4586

3. Historic Places, Management Section

   Telephone: (03) 9412 4522
   Facsimile: (03) 9412 4330

4. Land Protection - Landscape and Weeds

   Telephone: (03) 9412 4665
   Facsimile: (03) 9412 4388

5. National Parks Service

   Telephone: (03) 9412 4461
   Facsimile: (03) 9412 4166

6. Public Land Management Branch

   Telephone: (03) 9412 4526
   Facsimile: (03) 9412 4742

Appendix B
List of Bodies and Organisations Which Can Assist in Determining Sites of Important Vegetation (continued)

Royal Botanic Gardens and National Herbarium
Birdwood Avenue
SOUTH YARRA 3141

Telephone: (03) 9252 2300
Facsimile: (03) 9252 2300

- The Royal Botanic Gardens and National Herbarium regarding the flora of Victoria, botanically important sites, vegetation surveys and cultural landscapes

Department of Human Services
2nd Floor
115 Victoria Parade
FITZROY 3065

Telephone: (03) 9412 7498
Facsimile: (03) 9412 7601

- The Aboriginal Affairs Group has records of the location of aboriginal sacred trees and sites

Latrobe University

Telephone: (03) 9479 1111

- Register of Rare and Endangered Species maintained by the Department of Biological Science, Latrobe University

APPENDIX C
Sag and Sway in Powerlines

SAG

The sag of a powerline conductor can vary greatly during the day.

The amount of sag in any span is dependent on the:
- span length;
- powerline conductor material;
- powerline conductor tension;
- temperature.

The temperature of a powerline conductor can vary dramatically in a space of half an hour resulting in a large increase of sag. This change in temperature can be caused by the ambient air temperature, solar radiation heating the powerline conductor or the electrical load on the powerline conductor. The variation of the powerline conductor's temperature is not normally detectable by a person observing the conductor and can result in unsafe powerline clearances.

Under normal operating conditions, **variations** in the sag of a powerline conductor in a span of less than 50 metres can be as great as 1 metre.

In longer spans of powerline conductor used in the distribution of electricity the **variation** of sag can be as great as 2 metres. It is important to recognise that the **actual** sag in long spans can be more than 10 metres.

SWAY

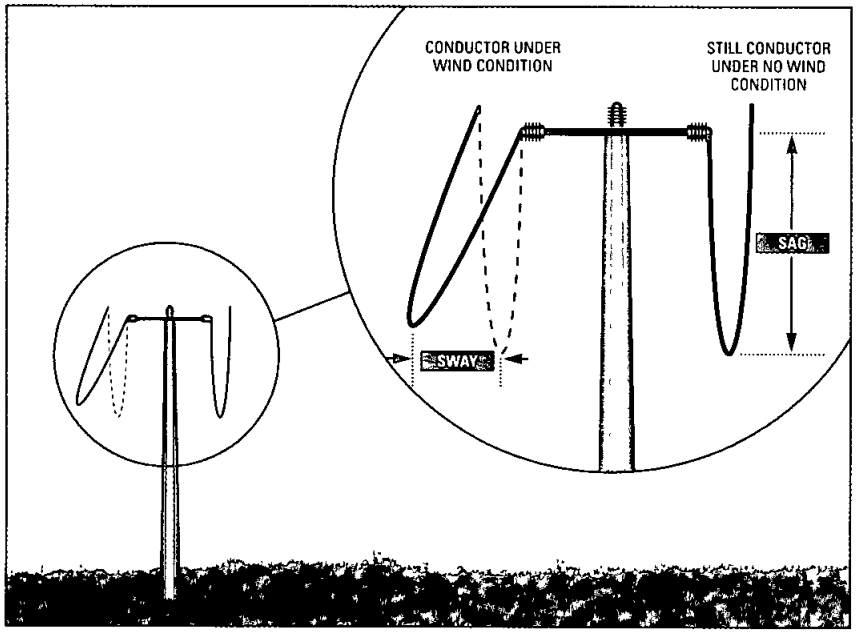
All powerline conductors sway. In other words, powerline conductors swing from side to side. The sway is often caused by wind passing over the powerline conductor or by objects accidentally bumping the conductor or conductor supports. Powerline conductors can sway greatly in light "vesper" winds which can set up resonant vibrations in the powerline.

The possible amount of sway in any span is also dependent on the sag in that span of the powerline at the time.

FURTHER DETAILS

To obtain details on the actual amount of sag and sway for overhead powerlines, contact the relevant distribution company in your area.

Figure 5 SAG AND SWAY IN POWERLINES



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