

5 March 2020

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Dear [REDACTED],

REMAKE OF THE ELECTRICITY SAFETY (ELECTRIC LINE CLEARANCE) REGULATIONS 2020

In response to your email dated 1 November 2019, we welcome the opportunity to comment on the proposed *Electricity Safety (Electric Line Clearance) Regulations 2020* and the associated regulatory impact statement.

Please find attached AusNet Services' detailed comments to the proposed changes to the regulations together with suggestions for further changes for consideration by Energy Safe Victoria.

The following summarises key suggestions for further consideration.

Electricity Safety (Electric Line Clearance) Regulations 2020

Applicable distances for uninsulated conductors in Hazardous Bushfire Risk Areas (HBRA)

The *minimum clearance space* for uninsulated conductor in HBRA is the sum of the *applicable distance* plus an allowance for conductor sag and sway.

Currently the *applicable distance* for uninsulated conductors in HBRA varies with span length which AusNet Services believes should be a constant value. The variable component for determining the required *minimum clearance space* should only be the allowance for conductor sag and sway.

Applicable distances for uninsulated conductor with span length greater than 100m in Low Bushfire Risk Areas (LBRA)

Including an allowance for sag and sway in the *applicable distance* used for the calculation of the *minimum clearance space* for spans up to 100m in LBRA, but excluding an allowance for sag and sway in the *applicable distance* for spans greater than 100m has resulted in double counting of an allowance for sag and sway for spans greater than 100m.

This is resulting in the *minimum clearance space* for uninsulated conductors spans greater than 100m in LBRA being greater than the minimum clearance space for HBRA for conductors of the same voltage and span length.

Transmission Line of Fall trees

Currently there are ambiguities in the management of trees located outside the transmission line easement with the potential to fall into the transmission line easement (known as 'line of fall trees'), with the text of the Code of Practice and the figure included to illustrate the concept showing two different clearance spaces.

AusNet Services believe this ambiguity can be addressed by defining two separate spaces; the 'managed vegetation zone', defined as the *minimum clearance space* in the Code of Practice, and the 'line of fall tree hazard space', which is the distance from the conductor in the still position to manage the risk of flashover if a tree adjacent to the transmission line fall towards the conductor.

In order to further explain our response, we would welcome the opportunity to meet with you at a convenient time. If you have any questions regarding this response, please don't hesitate to contact me on [REDACTED]

Sincerely,



[REDACTED]
Network Safety Manager
AusNet Services

Attachment: Detailed comments on the proposed 2020 Electricity Safety (Electric Line Clearance) Regulations 2020

AusNet Services

Detailed Comments on the Proposed 2020 Electricity Safety (Electric Line Clearance) Regulations

Proposed Regulation Number	Existing Regulation Number	Description of proposed changes	AusNet Services Comments
Regulations – Part 1			
1(b)(ii)	-	Objectives added prescription of: 'a standard and practices to protect the health of trees that require cutting in accordance with the Code'	AusNet Services supports this amendment.
1(b)(iii)	1(b)(ii)	'danger of electric lines causing fire or electrocution' replaced by: 'the danger of trees contacting electric lines and causing fire or electrocution'	AusNet Services supports this amendment, as it clarifies that it is the risk of the interactions between vegetation and the electric lines, as opposed to other risks associated with electric lines.
1(b)(iv)	1(b)(iii)	No changes proposed	In line with the changes proposed 1(b)(iii), above, AusNet Services suggests that this clause is modified to clarify that it is the maintenance of vegetation clearances to electric lines, as opposed to general maintenance of the electric lines.
-	1(f)	Deleted: 'to make related amendment to the Electricity Safety (Installations) Regulations 2009.	AusNet Services supports this amendment.
5	5	Definition of 'cut' modified to include: '(b) does not include removing the tree'	AusNet Services supports this amendment.
5	1 of Schedule 1	Definition of 'low bushfire risk area' moved from the Code into the body of the regulations and redefined as 'not a hazardous bushfire risk area' (with hazardous bushfire risk areas defined in Section 3 of the Act)	AusNet Services supports this amendment.
5	5	Definition of 'tree of cultural or environmental significance' updated to reference current version of the Heritage Act (2017)	AusNet Services supports this amendment.

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Detailed Comments on the Proposed 2020 Electricity Safety (Electric Line Clearance) Regulations

Proposed Regulation Number	Existing Regulation Number	Description of proposed changes	AusNet Services Comments
Regulations – Part 2			
8	8	Prescribed penalty provisions updated to reflect re-numbering of the Code. Clause 19 Dispute Resolution removed.	AusNet Services supports this amendment.
9	9	Title changed to include 'and submission'	AusNet Services supports this amendment.
9(2)	9(2)	'a responsible person' replaced by: 'a responsible person that is not a major electricity company' Proposed to allow differing requirements for major electricity companies and other responsible persons.	AusNet Services supports this amendment.
9(3)	-	New clause: 'MECs must prepare and submit to ESV for approval a management plan relating to compliance with the Code for the period from 1 July 2021 to 30 June 2026 by 31 March 2021.'	AusNet Services supports this amendment, aligning the requirements for the submission of vegetation management plans with those for bushfire mitigation management plans and electricity safety management schemes.
9(4)	-	New paragraph added to ensure that a management plan specifies: 'any hazardous bushfire risk areas and low bushfire risk areas in the land referred to in paragraph (f) (as indicated on the map)	AusNet Services supports this amendment.
9(4)(h)(i)	9(4)(g)(i)	'native' replaced with: 'indigenous to Victoria'	AusNet Services supports this amendment.
9(4)(i)	9(4)(h)	'is required' replaced with: 'will'	AusNet Services supports this amendment.

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Detailed Comments on the Proposed 2020 Electricity Safety (Electric Line Clearance) Regulations

Proposed Regulation Number	Existing Regulation Number	Description of proposed changes	AusNet Services Comments
9(4)(j)(ii)(A)	9(4)(i)(ii)	'cable' replaced with: 'conductor' Note: this change has been applied throughout the document.	AusNet Services supports this amendment.
9(4)(j)(ii)(A)	-	'span of an electric line' replaced with 'electric line span' Note: this change has been applied throughout the document.	AusNet Services supports this amendment.
9(4)(p)	9(4)(o)	'in accordance with the Code' replaced with: 'in accordance with the Code and the Electricity Safety (Installations) Regulations 2009'	AusNet Services assumes this will be updated to reference the Electricity Safety (General) Regulations 2019.
9(4)(r)	9(4)(q)	'dispute resolution procedures' replaced with: 'a procedure for the independent resolution of disputes to electric line clearance'	AusNet Services supports this amendment combined with the deletion of Clause 19 Dispute Resolution of the Code.
9(4)(s)	-	New paragraph: 'if ESV has granted an exemption under Regulation 11 relating to a requirement of the Code, details of the exemption or a copy of the exemption.'	AusNet Services supports this amendment.
-	9(4)	Deleted: 'A method for determining an additional distance that allows for cable sag and sway may provide for different additional distances to be determined for different parts of a span of electric line.' Clause 9(4)(j) re-worded to incorporate this requirement	AusNet Services supports this amendment.

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Detailed Comments on the Proposed 2020 Electricity Safety (Electric Line Clearance) Regulations

Proposed Regulation Number	Existing Regulation Number	Description of proposed changes	AusNet Services Comments
-	10(2)	Deleted: 'If the responsible person is a major electricity company they must, before 31 March in the year that the financial year commences, submit the management plan to Energy Safe Victoria for approval.'	AusNet Services supports this amendment.
10(6)	10(7)	Deleted: '(b) available for inspection at the responsible person's principal office in the State during normal business hours'	AusNet Services supports this amendment.
-	11(2)	Deleted: 'A responsible person who receives an exemption under subregulation (1) must ensure that a copy of the exemption is – (a) Published on the responsible person's Intranet site; and (b) Available for inspection at the responsible person's principal office in the State during normal business hours.'	AusNet Services supports this amendment, combined with the amendments proposed to and 9(4)(s) and 10(6)
11(2)	-	Added: 'A responsible person who is granted an exemption under this regulation must comply with the conditions (if any) of the exemption.'	AusNet Services supports this amendment.

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Detailed Comments on the Proposed 2020 Electricity Safety (Electric Line Clearance) Regulations

Proposed Regulation Number	Existing Regulation Number	Description of proposed changes	AusNet Services Comments
12	12	Offences for which infringement notices may be served updated to reflect re-numbering of the regulations. Clause 3(1) of the Code added as a prescribed offence.	AusNet Services notes that Clause 3(1) has been added as a prescribed offence. In line with recommendation 9 of the Grimes Review ¹ , AusNet Services would welcome further guidance from ESV on their 'Compliance and Enforcement Policy' to provide greater understanding of ESV's 'compliance pyramid' model and how the addition of this prescribed offence will be applied in practice.
Regulations Part 3 – Transitional arrangements and expiry and Part 4 – Consequential and related amendments to other regulations			
-	13 to 16	Deleted and replaced with new Part 3 – Consequential amendment and expiry	AusNet Services supports these amendments.
Schedule 1 – Code of Practice for Electric Line Clearance			
Part 1 – Preliminary			
1	1	'Cable spreader' replaced with 'conductor spreader' and definition changed from 'an insulated rode used to maintain distance between cables of a low voltage electric line' to: 'an insulated rode use to maintain distance between uninsulated conductors of an aerial low voltage electric line'.	AusNet Services supports this amendment.
1	1	Added 'electric line span' to mean 'the section of the electric line between two adjacent supporting structures'	AusNet Services supports this amendment.

¹ Independent Review of Victoria's Electricity and Gas Network Safety Framework – Final Report, December 2017

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Detailed Comments on the Proposed 2020 Electricity Safety (Electric Line Clearance) Regulations

Proposed Regulation Number	Existing Regulation Number	Description of proposed changes	AusNet Services Comments
1	1	Modified (d) of definition of 'insulated cable' from '(d) insulating cover' to: '(d) a conductor to which [an] insulating cover has been applied'	AusNet Services supports this amendment, with the addition of the 'an' to the definition.
1	1	Definition of 'insulating cover' updated to replace superseded Australian standards with their current equivalent standards.	AusNet Services supports this amendment.
1	1	Definition of 'railway supply network' modified from 'the supply network of a railway that is a heavy railway' to: 'the supply network of a railway', with a note added that 'railway' and 'supply network' are defined in the Act.	AusNet Services supports this amendment.
1	1	Definition of 'suitably qualified arborist' updated removing obsolete qualifications with their current equivalent.	AusNet Services supports this amendment.
Part 2 – Clearance responsibilities			
4(2)(c)	-	Added: '(c) in the case of a space distance of 40 metres or less, the branch is more than 150 millimetres from the line; and'	AusNet Services supports this amendment, combined with 4(2)(d).
4(2)(d)	4(2)(c)	Modified '(c) the branch is more than 300 millimetres from the lines; and' to: '(d) in the case of a span distance greater than 40 metres, the branch is more than 300 millimetres from the line; and'	AusNet Services supports this amendment, combined with 4(2)(c).
6	6	New clause.	AusNet Services supports this amendment.

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Detailed Comments on the Proposed 2020 Electricity Safety (Electric Line Clearance) Regulations

Proposed Regulation Number	Existing Regulation Number	Description of proposed changes	AusNet Services Comments
8	7	No changes proposed. (Owner or operator of a transmission line must manage trees around minimum clearance space)	See Appendix C.
11	10	Title changed from 'Cutting or removal of specified trees must be minimised' to: 'Cutting or removal of indigenous or significant trees must be minimised'	AusNet Services supports this amendment.
11(3)(a)	10(3)(a)	Changed from '(a) native trees' to: '(a) trees that are indigenous to Victoria'	AusNet Services supports this amendment.
16(2)	15(2)	Added note: 'Section 8 of the Electronic Transactions (Victoria) Act 2000 provides that a requirement to give information in writing can be met by means of electronic communication'.	AusNet Services supports this amendment.
17(3)	16(3)	Changed from 'A written notice published under subclause (2) must be published in a newspaper circulating generally in the locality of the land in which the tree is to be cut or removed' to: 'A written notice published under subclause (2) must be published on the responsible person's Internet site or in a newspaper circulating generally in the locality of the land in which the tree is to be cut or removed.'	AusNet Services supports this amendment.
17(5)	16(5)	Changed from 'from the date of the notice' to: 'after the date of the notice'.	AusNet Services supports this amendment.

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Detailed Comments on the Proposed 2020 Electricity Safety (Electric Line Clearance) Regulations

Proposed Regulation Number	Existing Regulation Number	Description of proposed changes	AusNet Services Comments
-	19	Deleted: 19 Dispute Resolution	AusNet Services supports this amendment.
Part 3 – Minimum clearance spaces			
23(b)	23(b)	'otherwise' replace with: 'in any other case'	AusNet Services supports this amendment.
23(b)	23(b)		The reference to regulation 9(4)(i)(ii), should be 9(4)(j)(ii)
25	25	No changes proposed.	See also Appendix B.
26	26	No changes proposed.	For consistency of terminology with the rest of the document, AusNet Services propose the title be changed from '...66 000 volt electrical line...' to: "...66 000 volt electric line..." See also Appendix B.
27	27	No changes proposed.	For consistency of terminology with the rest of the document, AusNet Services propose the title be changed from '...66 000 volt electrical line...' to: "...66 000 volt electric line..." See also Appendix B.

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Detailed Comments on the Proposed 2020 Electricity Safety (Electric Line Clearance) Regulations

Proposed Regulation Number	Existing Regulation Number	Description of proposed changes	AusNet Services Comments
28	28	No changes proposed.	For consistency of terminology with the rest of the document, AusNet Services propose the title be changed from '...66 000 volt electrical line...' to: "...66 000 volt electric line..." See also Appendix A.
29	29	No changes proposed.	See also Appendix A.
30	30	No changes proposed.	See Appendix C.

Detailed Comments on the Proposed 2020 Electricity Safety (Electric Line Clearance) Regulations

Appendix A APPLICABLE DISTANCES FOR UNINSULATED CONDUCTOR IN HBRA

Clauses 28 (2) and 29(2) of the Code define the *minimum clearance space* for uninsulated conductor in hazardous bushfire risk areas (HBRA) as:

- (a) The space extending away from the line in all directions perpendicular to its axis for the applicable distance and an additional distance that allows for conductor sag and sway; and
- (b) the space above the space described in paragraph (a)

The *applicable distances* for uninsulated conductor HBRA are shown in Figure 1. This figure shows that the *applicable distance* increases with the length of the span up until a given span length, beyond which it remains constant.

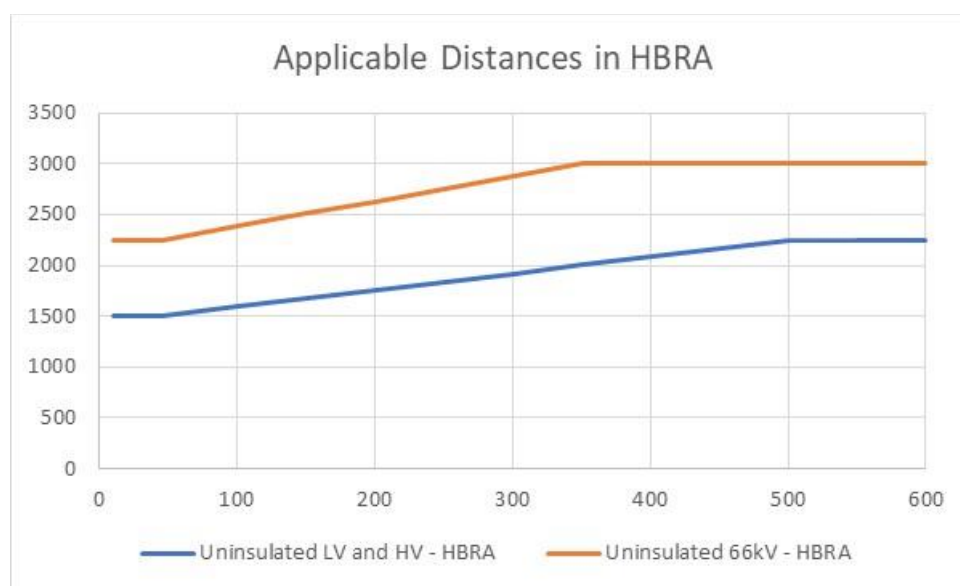


Figure 1: Applicable Distances in HBRA

As the *minimum clearance space* is determined by adding an allowance for sag and sway to this *applicable distance*, AusNet Services questions the rationale behind having an *applicable distance* which increases with span length.

The *applicable distance* is the minimum distance vegetation must be kept from the conductor to prevent a flashover² and provide safe working distances. The allowance for sag and sway determines the envelope of movement of the conductor due to wind, load, temperature, i.e. the extremities of movement of the conductor.

It follows, if the *applicable distance* for the first and last sixths of the span is adequate to maintain clearances at a static pole (where there will be no allowance for sag and sway), then this should also be adequate to maintain clearances once an allowance for sag and sway has been added to the mid-span of the conductor.

It appears that some other unexplained additional clearance, which increases with span length, has been included into the *applicable distance*, adding up to an additional 750mm to the *applicable distance* compared to that at the pole.

AusNet Services believes that the *applicable distances* in HBRA should be a constant value that does not vary with span length. As the *minimum clearance space* is calculated by adding an allowance for sag and sway to the *applicable distance*, it is the allowance for sag and sway which will vary with the span length and thus cause the *minimum clearance space* to vary with span length.

² A flashover is when electricity, especially at higher voltages, jumps across an air gap to create a conductive path. A flashover may occur between wires or from wires to the ground or nearby objects.

Detailed Comments on the Proposed 2020 Electricity Safety (Electric Line Clearance) Regulations

Appendix B APPLICABLE DISTANCES FOR UNINSULATED CONDUCTOR WITH SPAN LENGTH GREATER THAN 100M IN LBRA

Clause 3(1) of the Code of Practice requires:

A responsible person must ensure that, at all times, no part of a tree for which the person has clearance responsibilities is within the minimum clearance space of an electric line span.

Clauses 25, 26 and 27 of the Code of Practice specify the *minimum clearance space* for uninsulated conductor in LBRA. Clauses 28 and 29 of the Code of Practice specify the *minimum clearance space* for uninsulated conductor in HBRA.

According to Clauses 25(2), 26(2) and 27(2), the minimum clearance space for a span of the electric line is defined as:

- the space extending away from the line in all directions perpendicular to its axis for –*
- (a) the applicable distance; and*
- (b) if the span is greater than 100m, an additional distance that allows for conductor sag and sway.*

According to Clauses 28(2) and 29(2), the minimum clearance space for a span of the electric line is defined as:

- (a) the space extending away from the line in all directions perpendicular to its axis for the applicable distance and an additional distance that allows for conductor sag and sway*

Table 1 summarises the requirements of the Code of Practice giving the *applicable distances* for conductor span lengths greater than 100m (which do not include an allowance for conductor sag and sway) in LBRA and HBRA.

Table 1: Applicable Distances for Uninsulated LV, HV and 66kV conductor (span length greater than 100m)

Span length (m)	Applicable Distance (mm)					
	Uninsulated LV		Uninsulated HV		Uninsulated 66kV	
	LBRA	HBRA	LBRA	HBRA	LBRA	HBRA
100	2500	1591	2500	1591	3500	2385
150	2500	1673	2500	1673	3500	2508
200	2500	1756	2500	1756	3500	2631
250	2500	1838	2500	1838	3500	2754
300	2500	1921	2500	1921	3500	2877
350	2500	2003	2500	2003	3500	3000
400	2500	2086	2500	2086	3500	3000
450	2500	2168	2500	2168	3500	3000
500	2500	2250	2500	2250	3500	3000
550	2500	2250	2500	2250	3500	3000

Table 1 shows that the *applicable distance*, and correspondingly the *minimum clearance space*, for LBRA is greater than for HBRA for conductor span lengths greater than 100m.

In LBRA, a conductor span length of greater than 100m corresponds to the length where the *minimum clearance space* changes from the *applicable distance* including an allowance for sag and sway to the *applicable distance* excluding an allowance for sag and sway.

It appears that at the 100m boundary, the sag and sway component that was included in the *applicable distance* for conductor spans of less than 100m was not removed prior to setting the *applicable distance*

Detailed Comments on the Proposed 2020 Electricity Safety (Electric Line Clearance) Regulations

for conductor span lengths of greater than 100m. This is shown in Figure 2 for high voltage electric lines (other than 66kV) in LBRA.

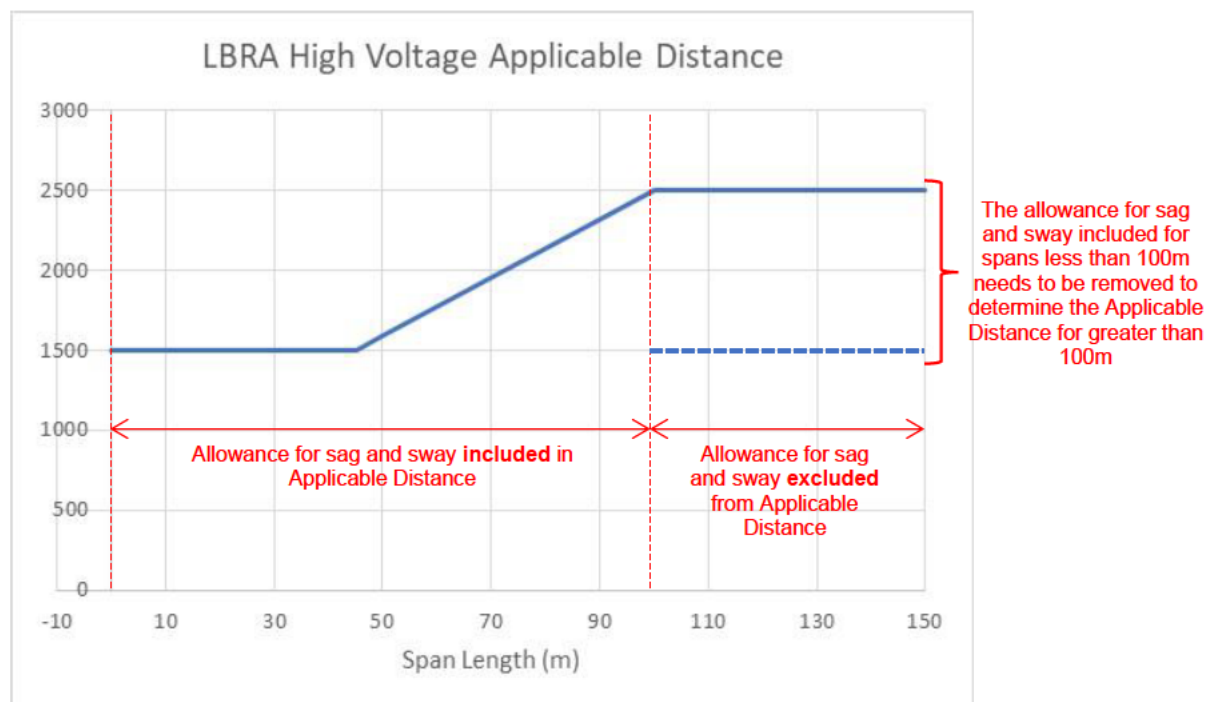


Figure 2: Applicable Distance for Uninsulated High Voltage Electric Lines (other than 66kV) in Low Bushfire Risk Area

This is resulting in an allowance for sag and sway is being double counted in LBRA for conductor span lengths of greater than 100m and consequently a greater *minimum clearance space* in LBRA than in HBRA.

AusNet Services suggests that the Code of Practice is revised to provide two methods for the determination of *minimum clearance space* for uninsulated conductor in LBRA:

1. **For Responsible Persons who do not wish to, or do not have the capability to, calculate an allowance for sag and sway:** Specify a deemed to comply *minimum clearance space* which includes an allowance for sag and sway for conductor span lengths up to 100m. This method shall not be used for conductor span lengths greater than 100m.
2. **For Responsible Persons who wish to calculate an allowance for sag and sway on a span by span basis:** Specify *applicable distances* to which an allowance for sag and sway must be added to calculate the *minimum clearance space*.

AusNet Services believes separating the requirements into two approaches will provide greater clarity as to when an allowance for sag and sway is and is not included in the quoted distances.

AusNet Services suggests that the deemed to comply *minimum clearance space* for uninsulated conductor span lengths of up to 100m in LBRA be aligned to the *applicable distance* for uninsulated conductor span lengths as given in the current Code of Practice (as summarised in Table 2).

Detailed Comments on the Proposed 2020 Electricity Safety (Electric Line Clearance) Regulations

Table 2: Deemed to Comply Minimum Clearance Space for Uninsulated Conductor Spans up to 100m in LBRA

	Deemed to Comply Minimum Clearance Space (mm)		
	First and last sixths of span	Middle two thirds	
Span Distance	All	≤45m	≤100
Uninsulated Low Voltage	1000	1000	$1000 + ((SD - 45) \times (1500 \div 55))$
Uninsulated High Voltage	1500	1500	$1500 + (SD - 45) \times (1000 \div 55)$
Uninsulated 66kV	2250	2250	$2250 + ((SD - 45) \times (1250 \div 55))$

AusNet Services suggests that the *applicable distances* for uninsulated conductors are aligned such that they are the same as for the first and last sixth of the span for uninsulated conductors in LBRA in the current Code of Practice (summarised in Table 3).

Table 3: Recommended Applicable Distances based on the Applicable Distance for the first and last sixth of the span in LBRA

Conductor Type	Recommended Applicable Distance (mm)
Uninsulated LV in LBRA with span length greater than 100m	1000
Uninsulated HV in LBRA with span length greater than 100m	1500
Uninsulated 66kV in LBRA with span length greater than 100m	2250

Appendix C LINE OF FALL TREES

C.1 Background

Transmission line vegetation management practices were established by the former State Electricity Commission of Victoria and have been maintained by AusNet Services. These practices included both the management of vegetation growing in towards the transmission line (known as the 'managed vegetation zone') and trees located outside the transmission line easement with the potential to fall into the transmission easement (known as 'line of fall' trees).

The risk being managed by the 'managed vegetation zone' is the risk of the vegetation coming sufficiently close to the conductor and causing a flashover. Transmission line conductors are not static and may sway in the wind and the clearance to ground (sag) may vary depending on the temperature of the conductor (which varies depending on the current being carried by the conductor, the ambient temperature and wind conditions). Thus, vegetation needs to be kept far enough away from the conductor to avoid flashover, considering the likely envelope of conductor movement.

To determine the maximum distance the conductor is likely to sway, a wind speed of 90km/h ('storm' on the Beaufort Wind Scale) is considered as the least likely wind conditions, as wind speeds greater than this are very rarely experienced.

The vertical boundary of the 'managed vegetation zone' from the conductor in the still position is determined by adding the maximum distance the conductor is likely to sway to the minimum distance given in the relevant Australian Standard to avoid a flashover plus a safety margin.

With regards to the management of 'line of fall' trees, these trees are managed to mitigate the risk of the tree falling toward the conductor and either:

- Contacting the conductor and causing damage; or
- Passing sufficiently close to the conductor and causing a flashover.

The more onerous of these two risks is the flashover risk, as this does not require the tree to physically contact the conductor to cause a flashover.

To assess the risk of a tree falling towards the conductor and causing a flashover, the following scenario is considered:

- A tree falling into the prevailing wind towards the conductor which is swaying towards the falling tree (as illustrated in the following diagram).

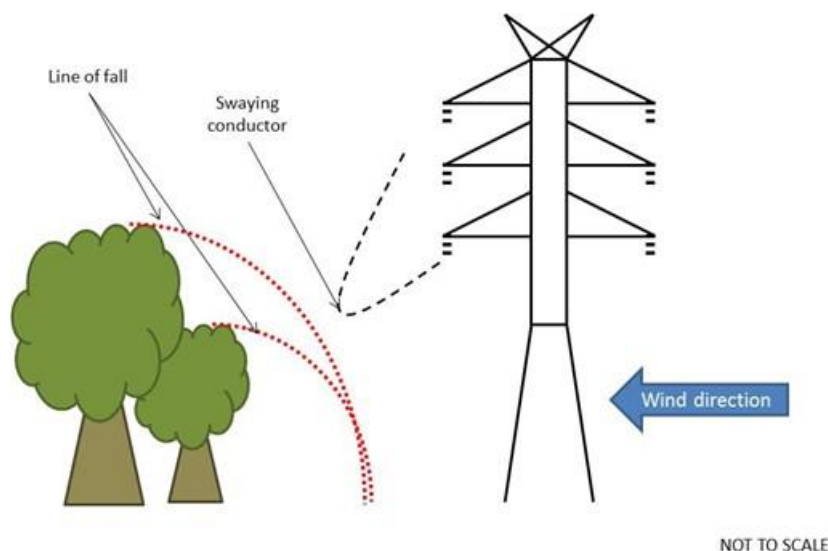


Figure 3: Scenario for 'line of fall' tree risk assessment

In conducting the risk assessment, a wind speed of 46km/h ('strong winds' on the Beaufort wind scale) is considered as the least likely wind conditions where this condition could arise, as it is considered that

Detailed Comments on the Proposed 2020 Electricity Safety (Electric Line Clearance) Regulations

at wind speeds of greater than this ('near gale' and above) trees would fall away from the conductor rather than towards it.

This is then used to determine the clearance from a still conductor by adding the minimum distance given in the relevant Australian Standard to avoid a flashover to the distance the conductor would sway in these wind conditions plus a safety margin.

These two clearance requirements are shown in the following figure, taken from AusNet Services' ESV-approved 2008/09 Vegetation Management Plan. It can be seen in this figure that 'line of fall' trees may fall into the 'managed vegetation zone' provided they do not fall too close to the conductor.

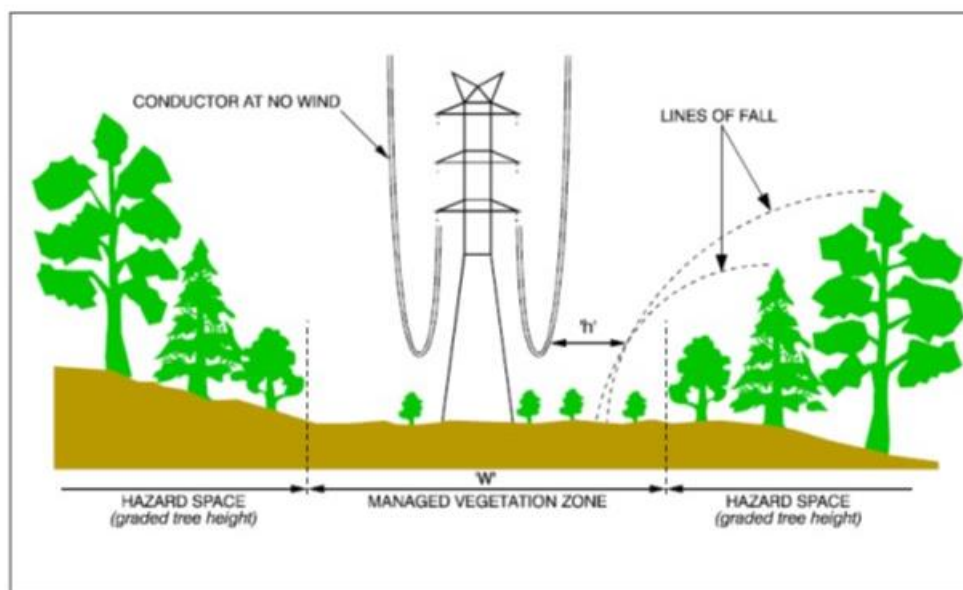


Figure 4: From AusNet Services' 2008/09 Vegetation Management Plan (Figure 3 Vegetation grading for the hazard space adjacent to a transmission line)

It should be noted that neither AusNet Services, nor personnel previously employed by the former SECV, have any knowledge of a tree adjacent to the transmission easements ever having made contact with the transmission network.

C.2 History of Regulations

In 2010, the requirements for the management of 'line of fall' trees were introduced into the regulations. In the regulatory impact statement for the 2010 Regulations, ESV came to the following conclusion in relation to transmission lines³:

Traditional transmission line vegetation management practices were appropriate and should be reflected in the new regulations.

With the formalising of these regulations, AusNet Services continued with their existing transmission line vegetation management practices.

In 2015 when the regulations were remade, in their annual report to the minister, in its document *Key changes proposed for the Electricity Safety (Electric Line Clearance) Regulations 2015 and its Code of Practice*, ESV reported:

*'There were no changes proposed in relation to clearance distances around transmission lines'*⁴

*'No policy intent or data changes are proposed in relation to transmission lines'*⁵

³ Proposed Electricity Safety (Electric Line Clearance) Regulations 2010 – Regulatory Impact Statement (FINAL 15/02/10), page 7

⁴ Key changes proposed for the Electricity Safety (Electric Line Clearance) Regulations 2015 and its Code of Practice, ESV 30 September 2014, Part 2 – Clearance responsibilities, page 5

⁵ Key changes proposed for the Electricity Safety (Electric Line Clearance) Regulations 2015 and its Code of Practice, ESV 30 September 2014, Part 3 – Minimum clearance spaces, page 8

Detailed Comments on the Proposed 2020 Electricity Safety (Electric Line Clearance) Regulations

Again, AusNet Services continued with their existing transmission line vegetation management practices.

No changes to the management of transmission line vegetation are currently proposed in the 2020 remaking of the regulations.

C.3 Issue

With the introduction of LiDAR technology to assist AusNet Services in the assessment of vegetation adjacent to transmission lines, some ambiguities in the regulations around transmission line vegetation management have surfaced.

Clause 8 of the proposed Code requires trees adjacent to the transmission line to be managed to avoid, as far as practicable, a tree entering the *minimum clearance space* around that line if the tree falls, with Clause 30 of the proposed Code defining the *minimum clearance space*. Clause 30 is supplemented by Figure 6 and Figure 7 in Schedule 2.

Extracts from the proposed Code are reproduced below.

Electricity Safety (Electric Line Clearance) Regulations
Exposure Draft
Schedule 1—Code of Practice for Electric Line Clearance

8 Owner or operator of transmission line must manage trees around minimum clearance space

A responsible person who owns or operates a transmission line must—

- (a) manage trees below the transmission line to mitigate, as far as practicable, the fire risks associated with the fuel load below the transmission line; and
- (b) manage trees adjacent to the transmission line to avoid, as far as practicable, a tree entering the minimum clearance space around that line if the tree falls.

9 Responsible person may cut or remove hazard tree

- (1) This clause applies to a responsible person referred to in section 84, 84C or 84D of the Act.
- (2) The responsible person may cut or remove a tree for which the person has clearance responsibilities if a suitably qualified arborist has—
 - (a) assessed the tree having regard to foreseeable local conditions; and
 - (b) advised the responsible person that the tree, or any part of the tree, is likely to fall onto or otherwise come into contact with an electric line.

Note

Under section 86B of the Act a Council, in a municipal fire prevention plan, must specify procedures and criteria for the identification of trees that are likely to fall onto, or come into contact with, an electric line, and procedures for the notification of responsible persons of trees that are hazard trees in relation to electric lines for which they are responsible.

- (3) For the purposes of this clause it is irrelevant that the tree is not within, and is not likely to grow into, the minimum clearance space for an electric line span.

Electricity Safety (Electric Line Clearance) Regulations
Exposure Draft
Schedule 1—Code of Practice for Electric Line Clearance

30 Transmission lines

- (1) The minimum clearance space for a span of a transmission line is—
 - (a) the space that is bound by the horizontal limits determined in accordance with subclause (2) and that, between those limits, extends downward from the level of the line for the applicable vertical distance; and
 - (b) the space above that space.
- (2) The horizontal limits of the minimum clearance space are reached by extending horizontally from the transmission line to the left and right of the line for the applicable horizontal distance.
- (3) For a transmission line of a nominal voltage that is specified in an item in Column 1 of the following table—
 - (a) the applicable horizontal distance is the sum of—
 - (i) the distance specified in Column 2 for that item; and
 - (ii) an additional distance that allows for conductor sag and sway; and
 - (b) the applicable vertical distance is the sum of—
 - (i) the distance specified in Column 3 for that item; and
 - (ii) an additional distance that allows for conductor sag and sway.

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Electricity Safety (Electric Line Clearance) Regulations
Exposure Draft
Schedule 1—Code of Practice for Electric Line Clearance

<i>Nominal voltage</i>	<i>Column 1</i>	<i>Column 2</i> <i>Applicable horizontal distance (without allowance for sag and sway)</i>	<i>Column 3</i> <i>Applicable vertical distance (without allowance for sag and sway)</i>
66 kV		3000 mm	3000 mm
More than 66 kV, but less than 220 kV		4600 mm	3700 mm
220 kV		4600 mm	3700 mm
275 kV		5000 mm	4200 mm
330 kV		5500 mm	4700 mm
500 kV		6400 mm	6400 mm

Note

This minimum clearance space is partially illustrated in Figures 6 and 7 of Schedule 2.

Division 2—Alternative compliance mechanisms

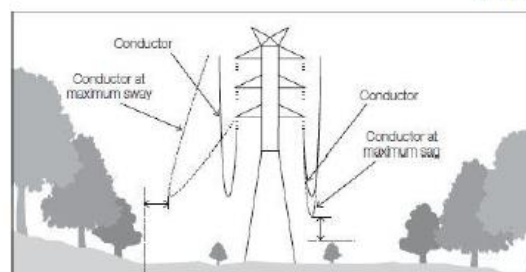
31 Application for approval of alternative compliance mechanism

- (1) This clause applies to a responsible person referred to in sections 84, 84C or 84D of the Act.
- (2) A responsible person may apply to Energy Safe Victoria for approval to use an alternative compliance mechanism in respect of an electric line span or a class of electric line spans.
- (3) The application must—
 - (a) include details of—
 - (i) the alternative compliance mechanism; and

Electricity Safety (Electric Line Clearance) Regulations
Exposure Draft
Schedule 2—Applicable distance for middle 2 thirds of electric line span

FIGURE 6—END VIEW OF THE TRANSMISSION LINE

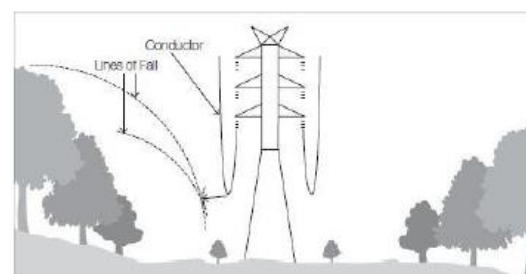
Clause 30



NOT TO SCALE

FIGURE 7—TREES ADJACENT TO THE TRANSMISSION LINE

Clause 8



NOT TO SCALE

The wording of Clause 8(b) implies that the vegetation needs to be prevented, as far as practicable, from falling into the ‘managed vegetation zone’, however Figures 6 and 7 of the Code imply that ‘line of fall’ trees are allowed to fall into the ‘managed vegetation zone’, provided that when they fall they remain a specified distance from the conductor in the still position.

This ambiguity arises because the initial drafting of the regulations in 2010, and subsequent revision in 2015, have not recognised that there are two clearance spaces to be managed:

1. The ‘managed vegetation zone’ to prevent flashover to vegetation adjacent to the transmission line as the conductor moves due to wind and loading (known in the Regulations as the *minimum clearance space*); and
2. The ‘line of fall tree hazard space’ to prevent flashover if a tree adjacent to the transmission line falls towards the conductor.

The figures included in the regulations to assist in illustrating the clearance spaces do make this distinction between the two clearance spaces.

Detailed Comments on the Proposed 2020 Electricity Safety (Electric Line Clearance) Regulations

C.4 Proposal

AusNet Services' proposes that the 2020 regulations are amended to address this inconsistency by making the following amendments (deletions struck through and marked in green, additions marked in red):

8 Owner or operator of transmission line must manage trees around the minimum clearance space

A responsible person who owns or operates a transmission line must –

- (a) manage trees below the transmission line to mitigate, as far as practicable, the fire risks associated with the fuel load below the transmission line, and
- (b) manage trees adjacent to the transmission line to avoid, as far as practicable, a tree entering the ~~minimum clearance~~ *line of fall tree hazard* space around that line if the tree falls.

30 Transmission lines

(1) The minimum clearance space for a span of transmission line is –

- (a) the space that is bound by the horizontal limits determined in accordance with subclause (2) and that, between those limits, extends downward from the level of the line for the applicable vertical distance; and
 - (b) the space above that space.
- (2) The horizontal limits of the minimum clearance space are reached by extending horizontally from the transmission line to the left and right of the line for the applicable horizontal distance.

(3) *The line of fall tree hazard space for a span of transmission line is –*

- (a) *the space bounded by a circle centred on the conductor at maximum sag in the still position with radius equal to the applicable line of fall tree hazard distance; and*
 - (b) *the space above that space.*
- (4) For a transmission line of a nominal voltage that is specified in an item in Column 1 of the following table –
- (a) the applicable horizontal distance is the sum of –
 - (i) the distance specified in Column 2 for that item; and
 - (ii) an additional distance that allows for conductor sag and sway; and
 - (b) the applicable vertical distance is the sum of –
 - (i) The distance specified in Column 3 for that item; and
 - (ii) An additional distance that allows for conductor sag and sway.
 - (c) *the applicable line of fall tree hazard distance is –*
 - (i) *The distance specified in Column 3 for that item.*

Figure 5 illustrates the line of fall tree hazard space described in the amendments suggested above.

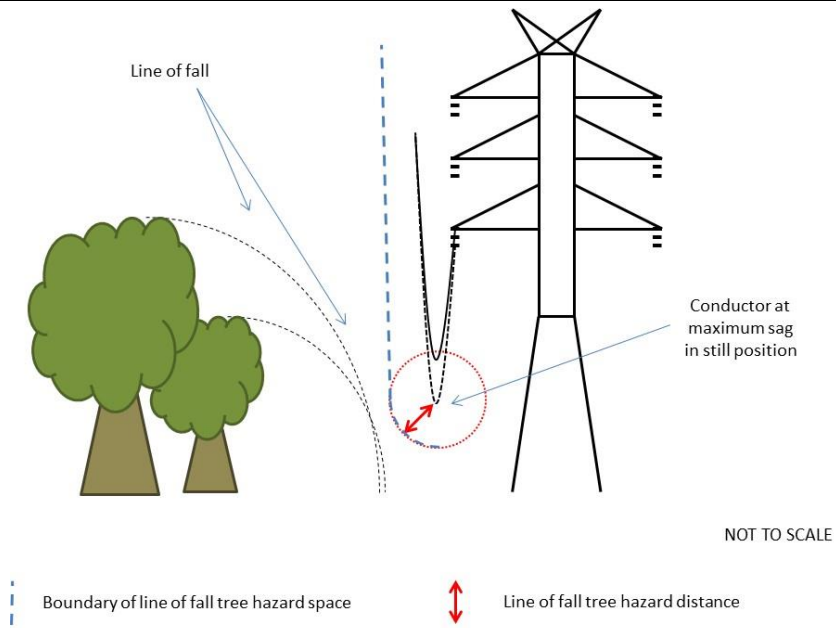


Figure 5: Line of Fall Tree Hazard Space