

## Submission on the Regulatory Impact Statement for the Electric Line Clearance Regulations 2020

### Aim of Regulations

It is said, the Regulations aim to strike “a balance of electrical safety and supply with the amenity and environmental values provided by trees”.

### This Submission

My submission contends the regulations fall well short of the intended aim, in non-urban areas as;

- The prescribed clearance zones are too small and does not sufficiently allow for;
  - Regrowth
  - Measurement error
    - Particularly when assessing for the natural sag and sway of the conductor
- The idea of vegetation above high voltage conductors in some of the most bushfire prone areas is absurd
- Trees outside of the clearance zone (which can fall in) are not adequately managed or maintained to meet community expectations.
- Use of fire starts as metric throughout RIS is inappropriate given wide variance in climatic conditions year to year. Management of higher consequence risks is required particularly with regard to potential loss during these events.
- The impact from REFCL and enhanced ACRs on faults, reliability and community expectations
  - Increased fault and outages at times of high bushfire risk impacting reliability
  - The aim should be to eliminate faults in first place
    - Aging infrastructure
    - Inadequate vegetation trimming
- Various Royal Commission recommendations have not been fulfilled, therefore many of the assumptions previously relied upon are simply not valid with respect to safety, community expectations and reliability.
- Increasing threat from climate change is not adequately addressed.
- The recent events of this most recent summer demonstrate that good powerline vegetation management and regulation is vital to stop widespread destruction and loss to the very amenity and environmental values this regulation seeks to protect.

- The regulations are utilised as a “Safe Harbour” provision and hence need sufficient rigour as to clearance requirements and teeth to ensure risks are eliminated or managed “as far as is reasonably practicable”.
  - ie. Surety that if the regulator and utilities “just comply” then this is all that’s required and for events that occur outside of these requirements is seemingly someone else’s challenge.
  - Recent events and the failure of the industry / government to implement the intent of various Royal Commission recommendations demonstrate the need for effective regulations.
  - It needs to be pointed out in the strongest possible terms, that vegetation contact with powerlines is dangerous, particularly on days of high bushfire risk. Such fire starts causes deaths, extensive loss of property, livelihood and damage to amenity values and the environment.
  - There is no “acceptable” metric or “safe” measurement as it currently exists within the proposed regulations.
- Regional and Rural Victoria is one of the most bushfire prone environments in the world and requires sufficient rigour if clearances are to be prescribed in the manner they are.

## Background

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] that whilst regulations are not intended to capture all

eventualities, a ten-thousand-fold increase in risk on the worst days needs to be considered and the regulators role should be to;

1. Ensure Compliance to the Regulations
2. Review the regulations as being fit for purpose and meeting community expectations.

## Effectiveness of Regulations

### Compliance with Current Regulations

A brief drive around regional Victoria quickly shows non-compliance with the regulations as they stand. The author of this submission has reported many grow ins to relevant utilities and has post visited the scene of a few recent fire events confirming such.

ESV reports into the South West St Patricks Day fires, subsequent Bunkers Hill and fires during the recent fire season appear to simply measure compliance with the regulations, often concluding "*as the vegetation came from outside the clearance space, no further action is required*". Given the consequence of these fires, the timing (often at times of high wind and extreme fire risk), how these are simply dismissed as "compliant" spans is troubling.

### Increased Reliance on LIDAR data

Much is made of increased accuracy, auditability and "digital twins" of vegetation compliance. Care is needed to ensure this does not further drive clearances down to "insufficient" regulatory clearances. Prior to more accurate measurements, a degree of uncertainty and (perhaps a conservative) allowance for error was added. Now, so called exact measurements are taken, and we perhaps are losing that margin. We need "fair dinkum" analysis and audit, not so much of the technology, but the underlying data utilised.

## Regulatory Fit for Purpose

Page 24 of the RIS makes the following observation:

Recent ESV data shows that for 23% of incidents, the type of contact was not specified. Of those where the contact mechanism was identified, 43% were due to blown branches, 51% were due to fallen branches **and 6% were due to contact by trees within the clearance space.**

That's to imply that 94% of vegetation incidents occur above or beside the powerline.

Falling branches is entirely preventable. Simply do not allow trees to overhang live HV conductor, particularly in high bushfire risk areas.

Blown branches can be reduced significantly if the appropriate care and assessment was taken in line with other neighbouring State (NSW and SA) requirements to hazard trees.



Fire start at Marong 6<sup>th</sup> January 2018– Vegetation across all three phases (Bendigo Advertiser)

There appears to exist a culture within the investigators engaged by the state safety regulator to focus on compliance, almost blind to the value that such fires can offer in regulatory and clearance reviews. “the branch came from outside of the clearance zone, so no further investigation required”. How are regulations to be assessed as “fit for purpose” if 94% of the fire start information is just reported as “blown” or “fallen”. There appears to be little opportunity to learn and improve fault and fire performance.

Prior to the early 2000, danger (or fall) trees were actively identified and managed by utility companies in Victoria. Danger trees are vegetation (or parts of vegetation) that fall outside of the mandated cutting corridor yet pose a threat to power lines if they were to fall across the line as what happened in the Black Saturday “Beechworth fire” and two of the “St Patrick Day Bushfires” described below.

In the Beechworth fire, two people died, 38 houses were damaged or destroyed, and sheds, farming equipment and stock were destroyed. Overall, the fire burnt 33,577 hectares, including about 23,000 hectares of state park and took 9 days to contain.

Prior to 2001, such trees were managed and maintained, yet in 2001, Danger trees, such as that that caused the devastation described above, were removed from the regulations – and I’ve been verbally advised that this occurred because “*danger trees were too difficult to manage*”.

#### RIS Over reliance on fire stats

The RIS focuses on fire starts instead of faults. It naturally follows that there are more faults than subsequent fires (which rely on a convergence of fuel, heat, low humidity and wind).

Fault data provides a solid insight into vegetation – powerline compliance and the fitness for purpose of the regulations. Transient faults are rarely investigated yet could provide substantial intel as to the potential for fire starts and the actual risk faced by the community.

Metrics of reliability, reduced fire starts, and reduced faults count for nothing when the wind blows hard in the middle of a hot summers day after a long period of drought.

The Lewis Report which came out of the South Australian investigation into Ash Wednesday in 1983 called out fire stats as an inappropriate measure of total bushfire risk when 'potential for damage' is adopted in its place (page 65 below)

These are the same conditions which give rise to days of extreme fire danger when bushfires, once started are most difficult to control.

In addition the density of powerlines is related to population density and property values.

These factors emphasise the conclusion of Barber (1977) and W D Scott (1984) that although some 2% of all bushfire ignitions may be attributed to powerlines, it is possible that they could contribute more than 50% of the total bushfire risk to life and property on days of extreme fire danger. The Working Party endorses the view that 'fire starts' is an inappropriate measure of total bushfire risk. when 'potential for damage' is adopted in its place, the serious nature of certain of the risks associated with powerlines can be properly understood. The damage inflicted on Ash Wednesday 1983 was indicative of this conclusion, although, given the many initiatives taken by ETSA since then, these risks are expected to have already been reduced.

Excerpt from Lewis Report 1983 (South Australia)

### Lulling into a sense of false security

Following a series of fires started by electrical assets in the 1977 bushfire season, the Esler Barber Report of 1977 provides a solid insight when he concluded with respect to powerline initiated bushfires (chapter 8 <https://www.parliament.vic.gov.au/papers/govpub/VPARL1976-78No91.pdf>);

*“On such days the approximately the same time and at the time of day when conditions are such that the rate of spread of a fire is likely to be at its peak. It may be that the relatively small number of fires in normal years for which the SEC installations are responsible has lulled the Commission into a sense of false security, but this should not have been so, having regard to the experience of January, 1969”*

Below are excerpts from the public records office of Victoria (contributing to the above Barber inquiry) and collated by the then SEC assistant claims office (N Kirk). Whilst acknowledging the data is old, not complete, and outside the scope of this submission to further data mine, it nonetheless clearly demonstrates the disparity and extent of powerline-initiated bushfires on the worst of worse days. To be repeated ominously in events of 1983, 2009 as well as a handful of the more recent bushfires currently experienced.

The report contains data clearly showing that in the period 8/1/1959 – 30/3/1977 covering a period of 18 years, that 29% of the fires occurred on only TWO days!

**NOTES**  
 Statistics - Fires Allegedly Involving SEC 8/1/59 - 30/3/77

The statistics have been produced from reports received of fires alleged caused electrically or by the SEC.

Not all fires are reported but it may be accepted that all significant fires are reported. In 1969 and 1977 more fires were reported than would otherwise be the case because of specific requests for all reports for certain periods.

The results or consequences of "faults" are purely fortuitous and "faults" which do not cause fires, outages or damage are not reported.

For the period 8/1/59-30/3/77 399 fires were reported. It is understood this would represent only a very small percentage of the total fires from all causes over this period. About half only involved an area of a few square yards. 111 or 29% of them occurred on two days - 8/1/69 and 12/2/77. The balance 288 or 71%, an average of about 15 per year occurred over the roughly 18-year period.

**Region Schedule**

South Western	130 or 32% - 2 days (8/1/69 & 12/2/77)	26	and balance	104
North Eastern	83 or 21% - 2 days	"	"	9 " " 75
Northern and Midland	50 or 13% - 2 days	"	"	17 " " 33
Eastern Metropolitan	44 or 11% - 2 days	"	"	20 " " 24
Mid Western	27 or 7% - 2 days	"	"	17 " " 10

Other 5 Regions all less than 20 or 5%.  
 Wimmera and Mallee had none on the two bad days.

**Size Schedule**

over 10 000 acres	7 out of 9 (2%) occurred on the two bad days
1000 and under 10 000 acres	10 out of 12 (3%) occurred on the two bad days
100 and under 1000 acres	11 out of 37 (9%) occurred on the two bad days

75% of fires were less than 10 acres.

RURAL FIRES BOARD OF INQUIRY  
 EXHIBIT 202  
 DATE 13-5-78

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Documents from 1977 showing fire stats – 1977 Barber Inquiry – PRO Victoria

## Powerlines, Vegetation and Fires

Acknowledging that arson, lightning and other natural causes of fires exist, extreme conditions and convergence of contributing factors see powerline-initiated fires normally balloon beyond the containable, overwhelming communities and causing large scale destruction of property, animal losses and human fatalities.

Whilst powerline bushfire starts account for approx. 1-2% of all bushfires, powerline-initiated bushfires have accounted for over 80% of deaths associated with bushfires in Australia over the last 50 years.

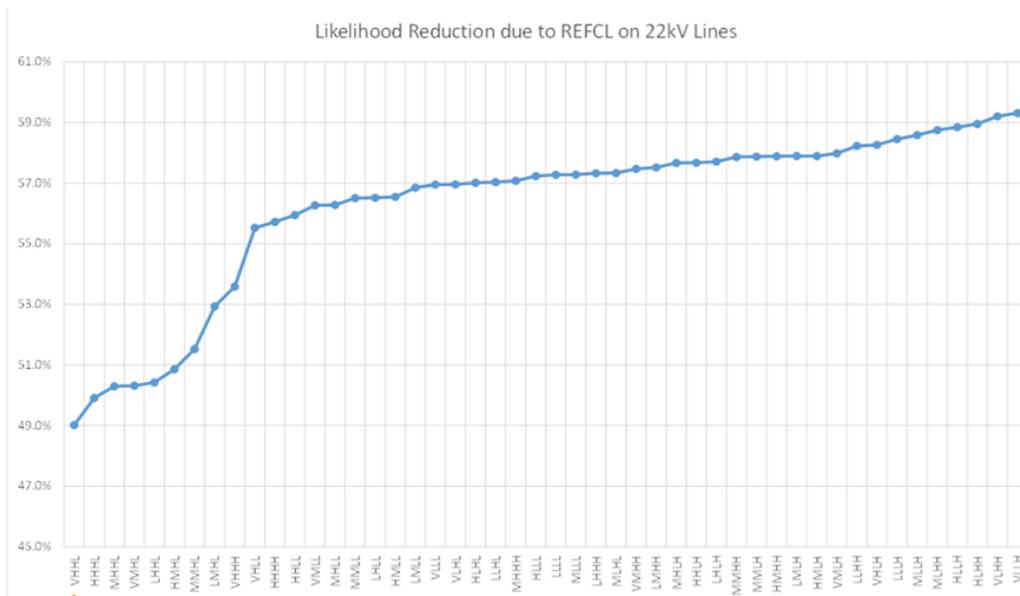
Why the disparity?

Justice Esler nailed it when he said "On such days the approximately the same time and at the time of day when conditions are such that the rate of spread of a fire is likely to be at its peak."

*We only need to look at the timing of the various fire starts over the catastrophic days to understand that at the time of failure;*

- Powerline assets (poles, conductor and accessories) are at the peak structural load

- Having in many cases aged and deteriorated beyond the ability to withstand applied forces.
- Vegetation suffering the same wind and heat as the adjacent powerline assets equally suffer peak structural load, losing branches and either;
  - Fall onto the line
  - Blown into the line
- At the time of such clashing / contact, this is also at the time the protection devices are at the least effectiveness.
  - Below is a graph of the much vaunted REFCL effectiveness at differing climatic conditions.



From Presentation: June 2019 on Monash Uni Powerline Bushfire Safety Short Course - Monday

- Worth noting that the much-publicised figure of “up to 60% effective” falls to less than 40% (certainly not significant) during periods of high wind, low humidity, high drought index and high temperatures, when we remove the required contributing effect (10%) of the enhanced ACR (see below table from CSIRO Huston paper);

**Table 2.** Ranges of relative ignition rate reduction for various technology options on average across all levels of meteorological conditions

Type	Description of treatment	Expected reduction in ignition likelihood (SWER)	Expected reduction in ignition likelihood (22 kV)
Bare-wire	The base case option is to leave bare-wire powerlines in place.	0%	0%
ACR operating on bare-wire and installation of new ACRs, mainly on SWER lines, that are capable of remotely have operational settings changes on bushfire risk days to reduce the time taken to clear a fault.	The operational changes are in accordance with technical recommendations and are one "fast" trip on a highest fire danger day or two "fast" trips on other bushfire risk days in the highest bushfire start risk areas.	-35% to -40%	-7% to -10%
Insulating bare-wire	Installation with modern HV Aerial Bundled Conductors (ABC) on the 22kV network with insulated equipment connections.	-96% to -98%	-96% to -98%
REFCL	Bare-wire conductor with new ACRs at section level and REFCL protection at feeder level.	0%	-48% to -60%
Undergrounding bare-wire	Replacement of bare overhead conductors with underground cable and insulated equipment connections.	-98% to -99%	-98% to -99%

From CSIRO Huston paper: Assessing the role of electricity networks in bushfire ignitions  
 Note: for REFCL to achieve reduction of 48% to 60% as per graph above, it requires the addition of ACR's at the section level.



Fire start on REFCL protected feeder 4<sup>th</sup> July 2018, Mt Macedon – tree taking out single phase

## 1983 Ash Wednesday Fires

Justice Eslers conclusions (from the 1977 inquiry – Refer “Lulling into a sense of false security” above) and the SEC observations were further confirmed in 1983 during the Ash Wednesday fires of February 1983 with four of the eight major fires in Victoria caused by electrical assets. In neighbouring South Australia, a similar story unfolded with the death of 26 people;

<https://www.cfa.vic.gov.au/about/about-ash-wednesday>

### Information about Ash Wednesday

- Severe rainfall deficiencies during 1982 produced drought conditions throughout Victoria during 1983
- The ten months between April 1982 and January 1983 were at that time the driest period on record
- Mid morning was hot and a dry northerly airflow from South Australia was strengthen rapidly over Victoria
- In the afternoon a frontal system continued to intensify and ahead of the firefront the hot dry airflow continued to strengthen and become more turbulent, producing gale force winds, high temperatures, low humidity and extensive areas of raised dust and smoke
- During February 1983, the weather was extremely hot. Temperatures were particularly hot on February 1, 8 and 16 when readings were in excess of 40 degrees
- During the 1982/1983 fire season, 22 total fire ban days were declared
- CFA attended nearly 3,200 fires during that fire danger period

## 2009 Black Saturday

The 2009 bushfires in January and February ravaged many parts of Victoria and touched directly and indirectly many millions of people in the State, across Australia and internationally. One hundred and seventy three people died, thousands of homes and other dwellings were destroyed and over 400,000 hectares were burnt.

<https://www.cfa.vic.gov.au/about/black-saturday>

The Royal Commission into Black Saturday fires of 2009 found powerline-initiated bushfires were to blame for 159 deaths (over 90%) of the fatalities.

The full report can be found below and is very detailed and broad in its scope and depth. Many of the recommendations delivered as a result of the Royal Commission such as improved community communication, have no doubt contributed to direct improvements in reducing and mitigating loss of life in recent events. <http://royalcommission.vic.gov.au/Commission-Reports/Final-Report.html>

The section on Electricity Caused Fires noted however:

Many of these fires are the result of Victoria’s aged and failing powerline assets, and relate in particular to the 28,000 km of Single Wire Earth Return (SWER) and 60,000 km of 22kV high voltage electricity cables across the State, which are predominantly bare-wire.

The need to replace Victoria’s ageing electricity infrastructure was identified more than 10 years ago, by the Victorian Bushfire Royal Commission, 2009:

“As components of the distribution network age and approach the end of their engineering life, there will probably be an increase in the number of fires resulting from asset failures unless urgent preventive steps are taken...

...now is the time to start replacing the ageing electricity infrastructure...The seriousness of the risk and the need to protect human life are imperatives Victorians can't ignore”.

<http://royalcommission.vic.gov.au/Commission-Reports/Final-Report/Volume-2/Chapters/Electricity-Caused-Fire.html>

- Also worth noting the Murrindindi Mill fire (subsequently found to be powerline initiated on Black Saturday by the Coroners Court), was not investigated by the royal commission at the time.

#### *Interim measures*

Recommendations (28 – 34) such as faster acting single shot ACR's and improved inspections and vegetation programs were placed under the heading “Interim Measures”, noting.

In view of the size of the existing electricity distribution network, any replacement program will take years to complete. It is therefore necessary to consider interim measures aimed at reducing the risk that the current network will lead to further bushfires before its replacement.

#### Protection of Human Life – Paramount

In the words of the royal commission itself, **‘the protection of human life’ was to be ‘paramount’ in all policy decisions.** That is, not something to be balanced off against potential costs or inconvenience to people, or even financial loss to some groups who might have to spend money to prevent fires. The protection of human life was to be paramount in all policy decisions.

#### Recommendation 27

The Royal Commission provided the following recommendation with respect to powerline bushfire safety;

The State amend the Regulations under Victoria's *Electricity Safety Act 1998* and otherwise take such steps as may be required to give effect to the following:

- the progressive replacement of all SWER (single-wire earth return) power lines in Victoria with aerial bundled cable, underground cabling or other technology that delivers greatly reduced bushfire risk. The replacement program should be completed in the areas of highest bushfire risk within 10 years and should continue in areas of lower bushfire risk as the lines reach the end of their engineering lives
- the progressive replacement of all 22-kilovolt distribution feeders with aerial bundled cable, underground cabling or other technology that delivers greatly reduced bushfire risk as the feeders reach the end of their engineering lives. Priority should be given to distribution feeders in the areas of highest bushfire risk.

Nowhere did the Royal Commission say this had to be done straight away or that 100% of the state required undergrounding. Nor did it talk of an immediate \$30 – 60 Billion dollar program.

The only requirement on timeline was the SWER replacement program in the highest bushfire risk areas within 10 years. This myth that all lines were to be undergrounded resulted in a much maligned initial response to the challenge that lay ahead and much has been written elsewhere on the subsequent response to the royal commission and the mitigation efforts. For further information check out the official government website dedicated to the program. <https://www.energy.vic.gov.au/safety-and-emergencies/powerline-bushfire-safety-program>

A specific recommendation to reducing risks posed by hazard trees is provided below;

#### Recommendation 30

The State amend the regulatory framework for electricity safety to require that distribution businesses adopt, as part of their management plans, measures to reduce the risks posed by hazard trees—that is, trees that are outside the clearance zone but that could come into contact with an electric power line having regard to foreseeable local conditions.

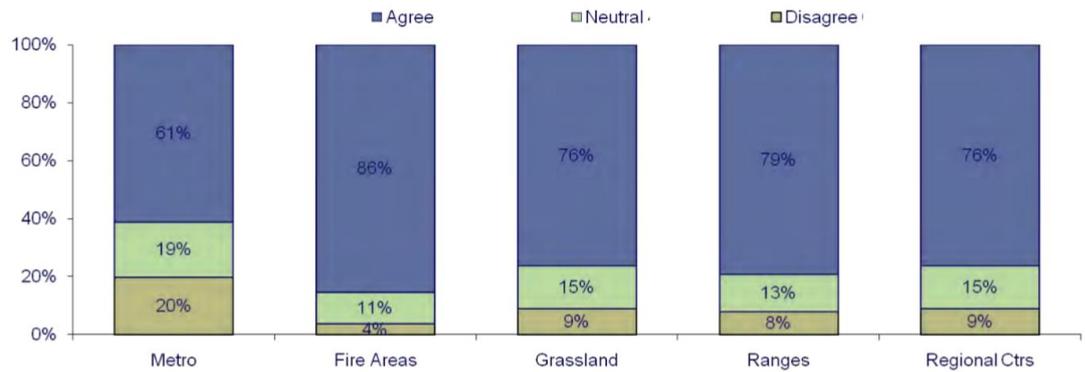
#### Powerline Bushfire Safety Taskforce

Following an initial workshop on a response to the findings of the Royal Commission recommendations a Powerline Bushfire Safety Taskforce was set up. The section on Enhanced Vegetation Clearance is as relevant today as it was penned 10 years ago (maybe more so following the recent devastating bushfires across Victoria, South Australia and New South Wales)

##### 2.5.2.2

*Enhanced vegetation clearance. Vegetation clearance requirements vary depending on whether a powerline is in a —high bushfire risk area or a —low bushfire risk area as defined by the CFA. This fire hazard rating determines the clearance space around the powerline and the party responsible for vegetation clearance. ESV will be reviewing the fire hazard ratings and the vegetation clearance regime more broadly, including an assessment of the most appropriate persons to be responsible for vegetation and the declaration of urban areas for the purposes of the Act. Electricity distributors were previously exempted from literal compliance with the Code during the winter period but were required to be strictly compliant during the bushfire season. The exemption allowed vegetation to encroach on the clearance space during the non-bushfire season. These exemptions are no longer granted – electricity distributors must now take into consideration any growth during the clearance cycle so clearances are maintained all year round.*

*ESV has increased its auditing of vegetation clearance to strengthen compliance with the Code. This has improved the level of compliance, particularly in low bushfire risk areas. Customer research undertaken by the Taskforce indicates that most customers (especially in non-urban areas) would accept increased vegetation clearance around powerlines and power poles if it meant that there was a reduced risk of fires (see Figure 6).*



**Figure 6: Customer attitudes to increased vegetation clearance to reduce fire risk**

*The Electricity Safety (Electric Line Clearance) Regulations were remade in 2010. The new regulations increase the clearance space around some electric powerlines and include a provision for the cutting or removal of —hazard trees. Exemptions that were previously provided to the electricity distributors to allow for —practical compliance rather than —literal compliance with the regulations have not been extended.*

Worth pointing out that communities living outside of the metro area have an overwhelmingly shared attitude of accepting further clearances to reduce bushfire risk.

## 2018 St Patricks Day

Despite much attention being given in the preceding years to powerline-initiated bushfire starts, the St Patricks day fires were something of a canary in the coal mine event.

<https://www.standard.net.au/story/5294347/how-the-st-patricks-day-fires-devastated-the-south-west/>

Similar in scope to the aforementioned fires, the wind event came late in the bushfire season (mid March) and much later in the day. Occurring some eight years after Black Saturday, powerlines were ‘protected’ by enhanced ACR’s which were suppressed being a total fire ban day.

[Investigations](#) showed four of the six fires started by electrical assets that night caused by “trees that hit the powerlines were outside the minimum clearance space required by electric line clearance regulations. The local safety regulator concluding that as a result they “will not be investigating these incidents further.”

Two other fires that night, also started by electrical assets, Terang (conductor clashing) and Garvoc (failed pole) are at the time of writing this article, the subject of further court action or prosecution.

## Current Situation Today

### (Post Black Saturday, St Patricks)

Perhaps a taste of things to come, whilst the interim measures installed post Black Saturday worked 'as designed', the safety regulator also decided to "not investigate further" why the enhanced ACR's failed to suppress any of the subsequent fires, no input into the woeful vegetation regulatory clearances has been fed into any review process and the nature of the fire starts showed nothing that would suggest REFCL's would have been effective either on any of the St Patricks Day fires.

It is well [documented elsewhere](#) that the first spark is all it takes to kick off a fire. Protection systems do not act "instantaneously" or prior to an event. They act in response to "an event". A leading bushfire expert, who has been involved in many investigations, makes the following observations;

- *"Dr Sweeting said he had been involved in investigating the cause of three fires on Black Saturday and REFCL may have stopped one of them.*
- *"I don't think REFCL would have stopped any of them. It is possible it could have stopped one of them involving a concrete pole," he said.*
- *"I suspect they can make the system work in the future but it's probably going to be too slow.*
- *"There has to be an earth fault before it kicks in. Clashing conductors are the cause I found the most and that's the one REFCL can't respond to.*
- *"It's not going to stop the main cause I've found when I've investigated bushfires."*

### Observations (Incl Overseas experience)

Justice Esler's findings are as relevant today and during Black Saturday, Ash Wednesday, St Patricks Day 2018 as they were when first penned. Wind drives failures (whether this be powerline component or vegetation falling or being thrown across bare wire powerlines). Coupled with the convergence of drought, fuel load and humidity, the spread of fire has overwhelmed communities.

Convergence does not happen every year. A code red day on 21<sup>st</sup> November last year had all the hallmarks of a horror day, yet it needs to be also remembered earlier that month, we had rain events and even snow in parts of Victoria. As to reliability on that day, at the height of the wind event, 150,000 regional customers lost power during a 40 degree day;

**FOR EMERGENCY WARNINGS AND WATCH AND ACT ALERTS, CLICK HERE**



3.09pm

An update from Powercor:

"Extreme winds are impacting power to homes and businesses across parts of the Powercor network.

Winds can bring down trees and other vegetation on powerlines and affect power to customers.

We are responding to reports of more than 37 fallen powerlines and more than 140 separate faults in the western part of Victoria.

Screenshot of Powercor Outage App (showing 85,117 customers off supply – neighbouring AusNet had a similar number) and press cutting from same time.

Much of the poor reliability shown above is also partially with increased sensitive protection systems such as REFCL's and ACRs. It should be noted that these devices only operate following a fault and fire risk is not eliminated as a result (see event of 4<sup>th</sup> Jan 2020 below).

Bad powerline initiated fires are shown to occur (as found in Victoria in 1977, 1983, 2009, 2018 and today??) as per Justice Eslers prophetic words " approximately the same time and at the time of day when conditions are such that the rate of spread of a fire is likely to be at its peak".

Other States, in other countries share the same challenge. For the most part, reliability and availability are easy measures for our regulators to focus into, reward and in some cases punish. Reliability is not the same as safety. The definition of safety is to be "free from danger". On those days when convergence occurs, is when we need proper solutions.

International experience from San Diego where similar fires occurred in October 2007 sees a program of line hardening, improved weather predictions and in exceptional circumstances, public safety powerline shutoffs on those bad days.

<https://www.spglobal.com/marketintelligence/en/news-insights/trending/5Z1q71TKsUqh4UA68ezPHA2>



\_\_\_\_\_ this excellent paper from California (which includes references to the Victorian PBSP work) highlights (in line with above);

- Wildfire clusters can result from power lines under extreme weather conditions.
- Power line fires average ten times larger than other fires.
- Prediction that failure rate should increase very steeply with wind speed.
- Case studies from California and Victoria suggest “weakest link” over single cause.
- Utility outage rate increases 10,000 fold under 95 km/h winds.

[https://www.researchgate.net/publication/273586530\\_Power\\_line\\_failures\\_and\\_catastrophic\\_wildfires\\_under\\_extreme\\_weather\\_conditions](https://www.researchgate.net/publication/273586530_Power_line_failures_and_catastrophic_wildfires_under_extreme_weather_conditions)

Huntly fire 4<sup>th</sup> January 2020

4<sup>th</sup> January – A large fire broke out when a tree fell onto a SWER line on a total fire ban (TFB) day a few km north of Bendigo.

This is when the highest sensitivity settings are used on the remote and enhanced ACR's. There was an ACR protecting this line 800m upstream of the fire location.

<https://www.bendigoadvertiser.com.au/story/6568439/tree-hits-power-lines-causes-huntly-fire/> )

A tree had fallen onto live conductor, charred and then brought the conductor to the ground, starting the ensuing fire.

With the heat and wind, the fire took over 40 tankers, 2 helicopters and unknown extra utes and personal to contain to 140 hectares. It burned to the edge of a forest and could have been a lot worse. Fortunately being close to the Bendigo, the CFA were able to quickly respond and contain the fire. The rate at which the fire spread is typical of powerline initiated bushfires and in line with Justice Eslers comments, coincide with failure and optimum conditions for rapid fire spread.

As to the cause, a tree (outside of the clearance zone – **aren't they all** – as mentioned above) 14m to the side of the line and 20m tall lost the top 16m towards the powerline.

The ACR did not stop the fire (despite only being 800m upstream of the incident) leading to further questions about the effectiveness of this technology on these extreme days.



Tree laying across line easement at fire source



Burn Marks on Tree at source of ignition (contact with conductor)

JANUARY 6 2020 - 5:00PM

# Millwood Road, Huntly fire caused by lines

Local News



Grass and scrub fire threatens property and livestock along the creek in Huntly. Picture: NONI HYETT

**Tuesday:**

POWERCOR last inspected the site of a Huntly fire caused by a tree hitting power lines in August 2019.

A spokesperson said Energy Safe Victoria had noted the site met minimum clearance requirements. This was confirmed by the CFA.

Energy Safe Victoria has been contacted for comment.

Bendigo Advertiser reporting of the fire – note throw away comment that the site met minimum clearance requirements

## Solution

What is needed with respect to the real prevention of powerline-initiated bushfire starts, and in line with the 2009 Royal Commission recommendations is line hardening solutions – This is not a quick fix. Since the Black Saturday fires, several interim measures have been put in place and the experience of St Patricks day and earlier this year, shows much more is still required to avoid the events of the past.

There is plenty of debate regarding whether REFCLs would or would not have prevented any of the killer bushfires on Black Saturday.

- Ten years ago the Victorian Bushfire Royal Commission set out its recommendations “to ensure we do not see a repetition of the tragedy of 7 February 2009”

- Victoria's adoption of REFCLs alone will not fulfill this aim. We are destined to have future killer powerline bushfires if we do not adopt additional technologies and practices.
- Unfortunately, the focus on REFCLs has been to the detriment of more effective and less expensive bushfire prevention strategies.
  - o For roughly half the cost of REFCLs Victoria could have replaced all the bare-wire powerlines in the high bushfire risk codified areas of the State with Covered Conductor, and achieve powerline bushfire risk reduction of 98% in those areas.
  - o In hindsight this is a missed opportunity and a distraction on research and roll out of other technologies.

It's time for Victoria to think again and recommit to the intent and recommendations from the Black Saturday Royal Commission if we are serious about making a meaningful reduction in powerline bushfire risk.

It needs to be borne in mind during any review of regulatory clearances (ie this review) the recommendations from the 2009 Victorian Royal Commission have been extensively watered down and as shown in subsequent fire events, in many situations, with regard to fire starts from powerlines we are no safer than we were prior to Black Saturday.

### Effect of Climate Change on Vegetation and Powerline Risk

Without getting into the causation or various methods to combat climate change, the following dot points are likely to hold true for the future and this needs to be taken into account when assessing the "fit for purpose" nature of the regulations and any proposed actions with respect to vegetation clearance.

- Greater extremes more often
- Increased Electricity network demand due to these extremes
- Increase in the number of Total Fire Ban (TFB) days
- Longer fire seasons
- Longer continuous periods of extended fire danger
- Climate change drives extreme weather
- More danger is posed by fires as fire weather gets worse
- The danger from fire behaviour is highest under extreme fire weather
- Increased risk posed by loss of supply because of the duration and depth of weather extremes
- There are more faults when fire weather gets worse
- There are more powerline ignitions – because there are more faults and a higher proportion of faults develop into ignitions when fire weather gets worse
- There are more ignitions overall during periods of high fire danger
- Expect longer periods of high danger – this accumulates risk, and stretches resources

## Other Comparable Legislation and Guidelines

Without going into the full details of legislative comparisons, the below demonstrates that clear guidelines, expectations and regulatory backstop are provided, to remove trees that pose a real danger to safety and reliability requirements.

### New South Wales Legislation

Fall in / Hazard Trees are required to be identified and managed. The risk of fall in, as far as reasonably practicable to do so, is required.

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#### *S1 - 3.4 Fall-in Vegetation Hazards*

*Fall-In Vegetation Hazards shall be identified as part of the vegetation management process and the general asset management and inspection processes implemented by the Network Operator.*

*A Network Operator shall assess the risk of Fall-in Vegetation Hazards that are readily visible from the perspective of the Network Asset as far as it is reasonably practicable to do so.*

*In assessing the potential risk of a Fall-in Vegetation Hazard consideration is to be given to the length of the vegetation beyond the potential breaking point compared to the distance from the network asset*

### South Australian Legislation

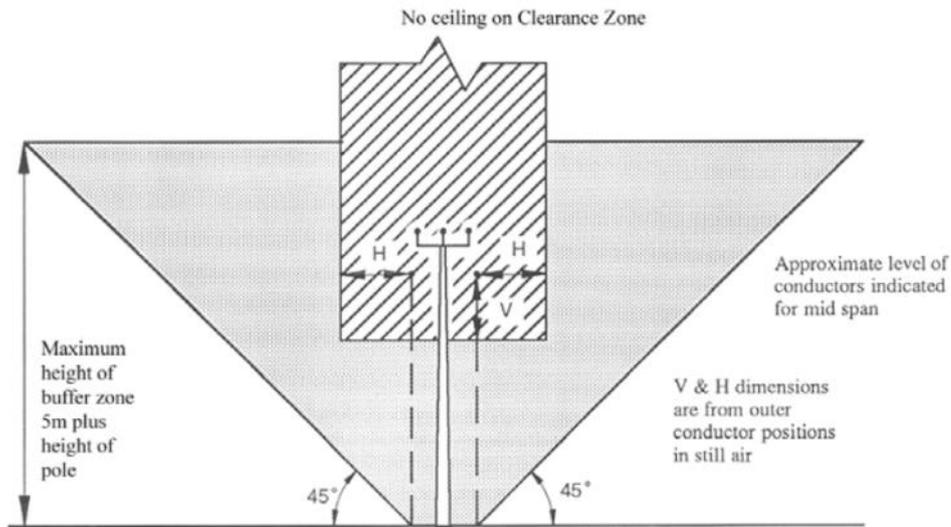
The experience of South Australia in comparison to that of Victoria since 1983 highlights the benefits of such line hardening and improved vegetation clearances. South Australia has larger clearances between conductors, stronger poles and a much greater regulated vegetation clearance requirement with powerline shut offs enacted as a last resort (shut offs are not considered as viable in Victoria, despite being a recommendation of the taskforce set up in response to the royal commission). The difference in fire starts during extreme fire weather between two adjoining states is notable. *We could learn a lot by simply looking over the border.*

In South Australia, the regulations provide a buffer zone (the space around the powerline that adjoins the clearance zone around that powerline) for high bushfire risk areas which enables vegetation to be removed or trimmed by the utility to maintain sufficient margin for danger (fall) tree risk.

Consideration of enhanced clearance requirements such as that utilised in South Australia and other countries, could provide for a much needed reduced risk to powerline initiated bushfire starts.

The addition of covered conductor in conjunction with these changes potentially eliminates the risk of such fire starts altogether.

**D.2—bushfire risk area—not insulated 33kV to 66kV—mid span (as shown in diagrams D.3 and D.4)**



Excerpt from South Australian Electricity (Principles of Vegetation Clearance) Regulations 2010  
Note shaded area which allows the utility to trim parts of vegetation including danger / fall trees