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# Gnotuk Fire Ignition (Camperdown–Bullen Merri Fire) 17 March 2018

## Transformer Pole 8 Cross Forest Road, Gnotuk

Technical investigation report

VICTORIA State Government

# Preface

This technical investigation report has been prepared by Energy Safe Victoria (ESV) pursuant to the objectives, powers and functions conferred on it by The Electricity Safety Act 1998 (Act).

Specifically, these include, amongst other things, to investigate events or incidents, which have implications for electricity safety and to regulate, monitor and enforce the prevention and mitigation of bushfires that arise out of incidents involving electric lines or electrical installations and to monitor and enforce compliance with this Act and the regulations.

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# Summary

On the 17 March 2018 a high wind event passed through Victoria's South West Region; it caused a tree branch to fail and contact the electrical network and ignite a fire. The Country Fire Authority (CFA) determined that the fire originated close to the location of Transformer pole 8 (Tx P8) on Powercor Australia Limited's distribution network on the 22 kilovolt (kV) Camperdown 006 feeder (CDN 006) at Cross Forest Road, Gnotuk.

Upon Energy Safe Victoria's (ESV) review of the incident notification report from Powercor Australia Limited, two ESV Compliance Officers (as electricity infrastructure and electric line clearance specialists respectively) attended the incident site on 13 April 2018.

The site includes Transformer pole 8 (Tx P8) on the east side of Cross Forrest Rd that supplies a Low Voltage (LV) service cable to a service pole on the west side of Cross Forest Rd. A gum tree branch failed adjacent to the service pole on the west side of Cross Forest Rd and fell onto the LV service cable.

From the evidence evaluated, the following sequence of events is the most likely cause of the fire originating near P8:

1. a tree branch on the west side of Cross Forest Rd failed and contacted an LV service cable that was attached between a service pole and Tx P8
2. this caused the service clamping fittings to break away at Tx P8, resulting in stress on the transformer LV bushings due to the LV cables being pulled
3. this in turn caused in the failure/breakage of the transformer's active LV bushing
4. this resulted in the transformer LV active lead contacting the earthed tank (casing) of the transformer creating an arcing event, and
5. molten material dropped to the ground starting the fire.

A witness from 114 Cross Forest Rd observed multiple arcing events at the pole and, within a short period of time, the fire had started.

The electrical cause of the fire ignition was an arcing event as a result of contact between an LV lead connected to the internal side of the transformer bushing and the earthed transformer tank (casing) which caused molten material to drop to the ground.

The Powercor HV electrical protection system records from the Camperdown zone substation do not show any record of this event. The HV fuses at the transformer operated when the fault occurred on the LV side of the transformer, between the transformer and the LV fuses. ESV review of the HV protection coordination confirmed that it operated as designed as the HV fuses at the transformer operated before the section control fuse or feeder circuit breaker operation.

Based on this information, and the eye witness account, ESV concludes that the fault on the transformer LV bushing caused molten material to drop to the ground causing the ignition of the fire on 17 March 2018 at or near Tx P8 Cross Forest Road.

# Introduction

## Scope

This report details the findings of an Energy Safe Victoria (ESV) technical investigation into the causes of, and contributing factors to, a fire that originated close to Transformer Pole 8 (Tx P8) Cross Forest Road, Gnotuk. The Country Fire Authority (CFA) describes the fire as the Camperdown– Bullen Merri Fire. This report will refer to this incident as the Gnotuk fire.

The report details the evidence gathered to support the technical conclusion reached, as well as outlining the relevant standard that applies to vegetation management near the distribution network at this location.

## Objectives

ESV's investigative objectives were to:

- identify the entities involved
- establish the initial facts and possible causes of the incident
- source information from CFA personnel that attended site
- obtain eye witnesses accounts of observations
- identify any standards relevant to the nature of the incident.

To meet these objectives, ESV sourced specific information that included:

- Bureau of Meteorology (BOM) data from the Mortlake weather station (being closest to the incident location)
- the Powercor Australia Limited:
    - incident report
    - smart meter data
    - HV operating records for the Kokoda spur[1]
    - ESV accepted Electric Line Clearance Management Plan
    - LiDAR information
- CFA information and photographs
- eye witness accounts
- a review of site conditions from Google Maps.

[1] This section of line in Cross Forest Road is also known as the Kokoda spur on existing detailed route plans (DRPs).

# Methodology

ESV's investigation included to:

- request specific information from Powercor Australia Ltd
- receive and analyse information supplied by Powercor Australia Ltd
- review operation records for the Kokoda Spur
- obtain and review weather records from the closest BOM weather stations
- review photos taken at incident site by CFA (when repairs were being undertaken)
- obtain a statement for the person that witnessed the fire ignition
- inspect the quarantined transformer
- prepare a report into the likely electrical cause of fire ignition.

# Background

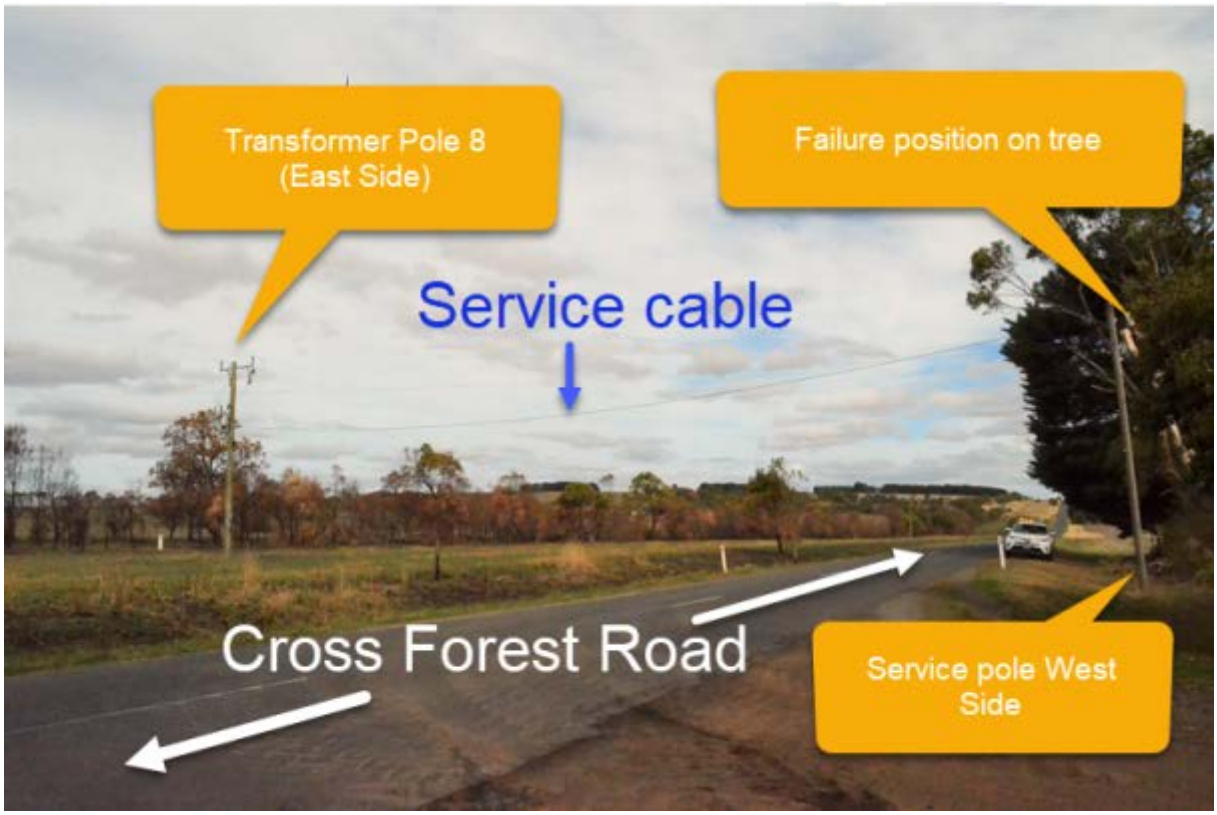
On 17 March 2018 a high wind event passed through Victoria's South West Region caused a tree branch on a customer's property to fail. The branch of the tree contacted a service cable that ran between Tx P8 and a service pole. The forces applied by the falling tree branch onto the service line caused damage to Powercor electrical network assets resulting in the ignition of a fire.

The fire originated close to the Tx P8 on Powercor Australia Limited's distribution network on the 22 kilovolt (kV) Kokoda spur in Cross Forest Road, Gnotuk.

In late March 2018 the Country Fire Authority (CFA) requested that Energy Safe Victoria (ESV) investigate if electrical assets located at Tx P8 Cross Forest Road may have been involved in the ignition of a fire at this location.

Upon ESV review of the incident notification report from Powercor Australia Limited, two ESV Compliance Officers (as electricity infrastructure and electric line clearance specialists respectively) attended the incident site on 13 April 2018 to gather measurements and site information as part of the ESV investigation.

**Figure 1: Site Layout**




# Declarations

The declarations relating to the period of the incident involved a Total Fire Ban (TFB) day, a Hazardous Bushfire Risk Area (HBRA), and Powercor Australia Limited special protection settings for TFB days.

## Total Fire Ban day

On 17 and 18 March 2018, TFB days were declared for the Southwest Fire District, which includes the Gnotuk area[2].

## Hazardous Bushfire Risk Area

Figure 2 shows a Graphical Information System (GIS) area map of the incident site in relation to the CFA declared Low Bushfire Risk Area (in green) and the HBRA area (in amber).

[2] Country Fire Authority 2018, State Government of Victoria, Melbourne, viewed 7 May 2018, www.cfa.vic.gov.au/warnings-restrictions/history-of-tfbs.

**Figure 2: GIS incident site area map**


## Powercor Australia Limited special protection settings

Powercor Australia Limited has an accepted (by ESV) Bushfire Mitigation Plan (BFMP) for managing fire risk on TFB days. The application of the plan considers a number of risk factors (including environmental) and involves applying changes to protection equipment settings on Zone Substation feeder circuit breakers and line Automatic Circuit Reclosers (ACR) that are identified in HBRA areas. In this instance there was not an ACR that protected the section of line where the fault occurred and the next upstream protection device are control spur fuses and then the feeder circuit breaker.

The Camperdown 006 (CDN 006) 22kV feeder circuit breaker protection device (located in the Camperdown Zone Substation) is an identified asset as per the Bushfire Mitigation Plan (BFMP) to which TFB day settings must be applied[3]. The settings were not able to be applied on 17 March 2018 as the protection equipment for circuit breaker CDN 006 was awaiting a firmware configuration update.

However as explained in further detail in this report, the CDN 006 feeder circuit breaker did not operate, and would not be expected to operate, as the fault occurred on the LV side of the transformer. Therefore application of TFB setting to the CDN 006 feeder circuit breaker would not have prevented the fire ignition.

The firmware configuration updates for CDN 006 were completed after the 17 March 2018 as part of recent Camperdown Zone Substation stations works, making the application of TFB day settings possible for the upcoming 2018/19 summer period.

[3] Powercor Australia Limited, Total Fire Ban Action Plan, Attachment A, 2018.

# Technical investigation

## Powercor event actions

The sequence of events:

- At 20:58 on 17 March 2018 smart meter data indicate that supply to 114 Cross Forest Road was disconnected (Tree branch failure). Note: supplies a single customer only
- At 01:21 on 18 March 2018 HV Control fuses were opened at Kokoda Pole 1, following report of pole/s down and faults as a result of fire damage downstream of pole 1 Kokoda spur
- At 9:50 on 19 March 2018 Electrical Access Permits (EAPs) were issued and later cancelled following completion of works to replace fire damaged poles
- At 15:46 on 19 March 2018 supply to the Kokoda spur was restored by closing HV Fuses at P1 Kokoda Spur
- At 15:48 on 19 March 2018 HV fuses supplying the transformer on Tx Pole 8 were closed restoring supply to the transformer. Supply to the customer at 114 Cross Forest Road was restored at 16:07 following testing.

## Powercor provided information

The smart meter data for the property affected by the tree branch failure indicates an electricity outage occurred at approximately 20:58 on 17 March 2018.

It is assumed that the transformer HV fuse operated at 20:58 on 17 March 2018 (as above) due to the fault current.

Powercor operational records show that the Kokoda Spur was isolated at 01:21 on 19 March 2018 to make the area affected by the fires safe.

On 19 March 2018 at 15:46 the supply was restored after the replacement of Tx P8 assets in Cross Forest Rd, and at 23:19 the supply was restored to other sections of the Kokoda spur.

## CFA site information

CFA fire investigators attended site on 19 March 2018 and took photographs of the incident scene at Tx P8 Cross Forest Rd. Copies of these photos were provided to ESV to assist with the investigation.

These photos show the:

- pole replacement being undertaken by Powercor
- broken tree limbs on the ground
- position of limb failure on the tree
- damage of LV bushing of the transformer that was removed
- charring on the pole where the HV earth cable is assumed to have been attached.

**Figure 3: Images provided by CFA**


# ESV site information

Two ESV Compliance Officers attended the site (as electricity infrastructure and electric line clearance specialists respectively).

Site observations:

- the site visit indicated a tree, Eucalyptus species, had a branch that failed approximately four metres from ground level
- the tree was growing on the customers property
- the tree branch failure position was identified against photos supplied by CFA
- subsequent additional trimming of branches has been undertaken by Powercor's vegetation management contractor as advised by the land owner
- the location where the branch broke away from the trunk of the tree was measured at 6.6 metres horizontally from the service pole using a Laser Rangefinder[4]
- customer advised ESV investigators that the tree had previously been cut/trimmed by Powercor contractors in 2015 and 2017
- new Tx P8 was installed with a new service cable installed to the service pole.

[4] The TruePulse laser rangefinder is a handheld device which enables a user to obtain the height of a tree. http://www.lasertech.com/TruPulse-Laser-Rangefinder.aspx

**Figure 4: Details from ESV site visit**

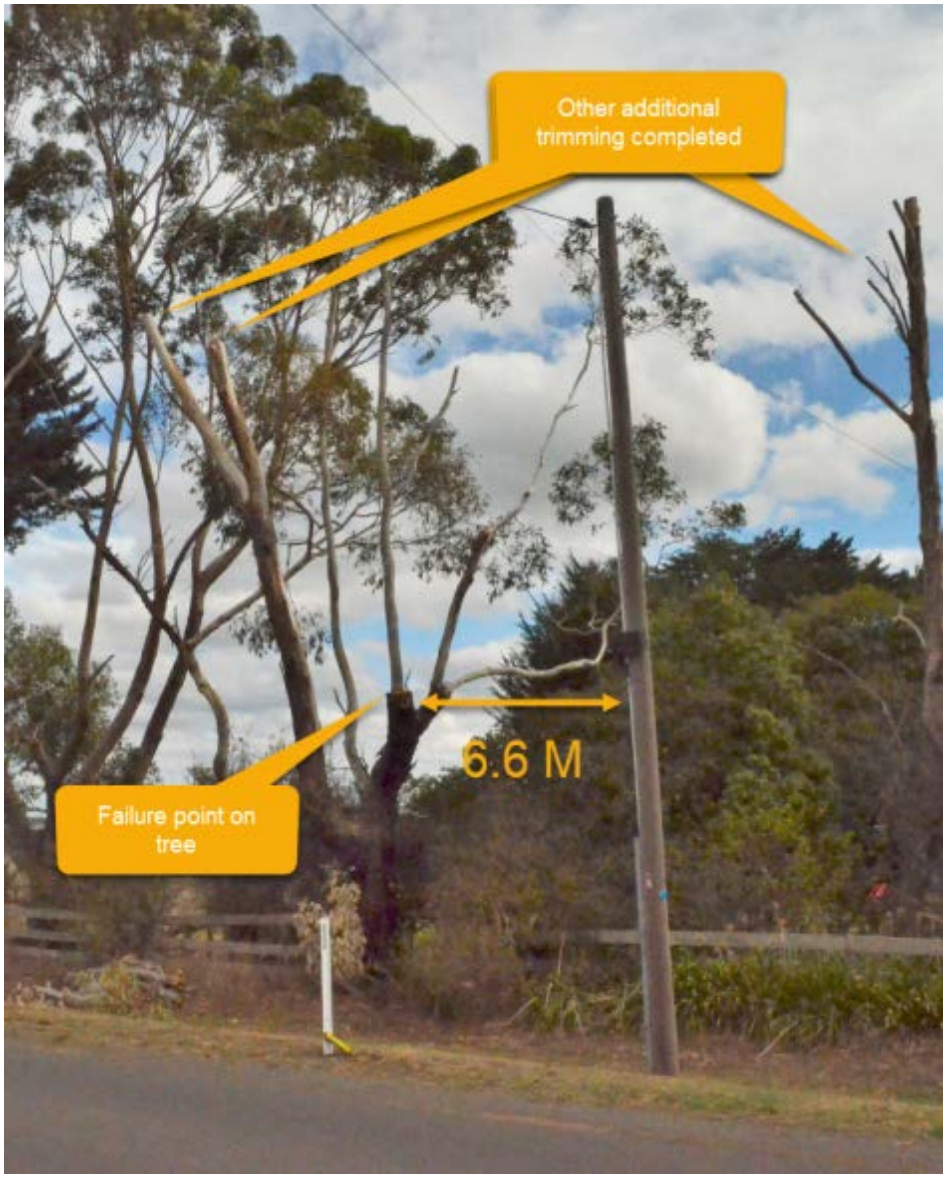


**Figure 5: Image of failure point on tree**


Figure 5 shows the failure point of the tree branch. The failed branch had grown from the site of an old wound where the tree had been cut back prior. The ESV arborist on site noted this as a point of structural weakness in the tree.

ESV concludes that the local damaging winds were strong enough to cause the limb to break and fall towards the powerlines.

From the evidence remaining on site and review of Google maps images (see Figure 7 & 8) it appears that the tree branch was attached in reasonably vertical position from the failure point and therefore at least 6m away from the service line. Due to its height above the failure point it was of sufficient length to contact the powerlines when it failed.

## Analysis of photos

The photos received from CFA and those taken by ESV indicate:

- the tree branch failed near an old cut point which identified as a potentially compromised in structure
- the tree branch failed and contacted a LV service line near a service pole one span away from Tx P8
- this in turn caused the service clamping fittings to break away at Tx P8, resulting in stress on the transformer LV bushings due to the LV cables being pulled
- the result was a failure of an active LV transformer bushing at Tx P8
- when the bushing failed an arc event occurred between the transformer LV wiring and the earthed transformer tank

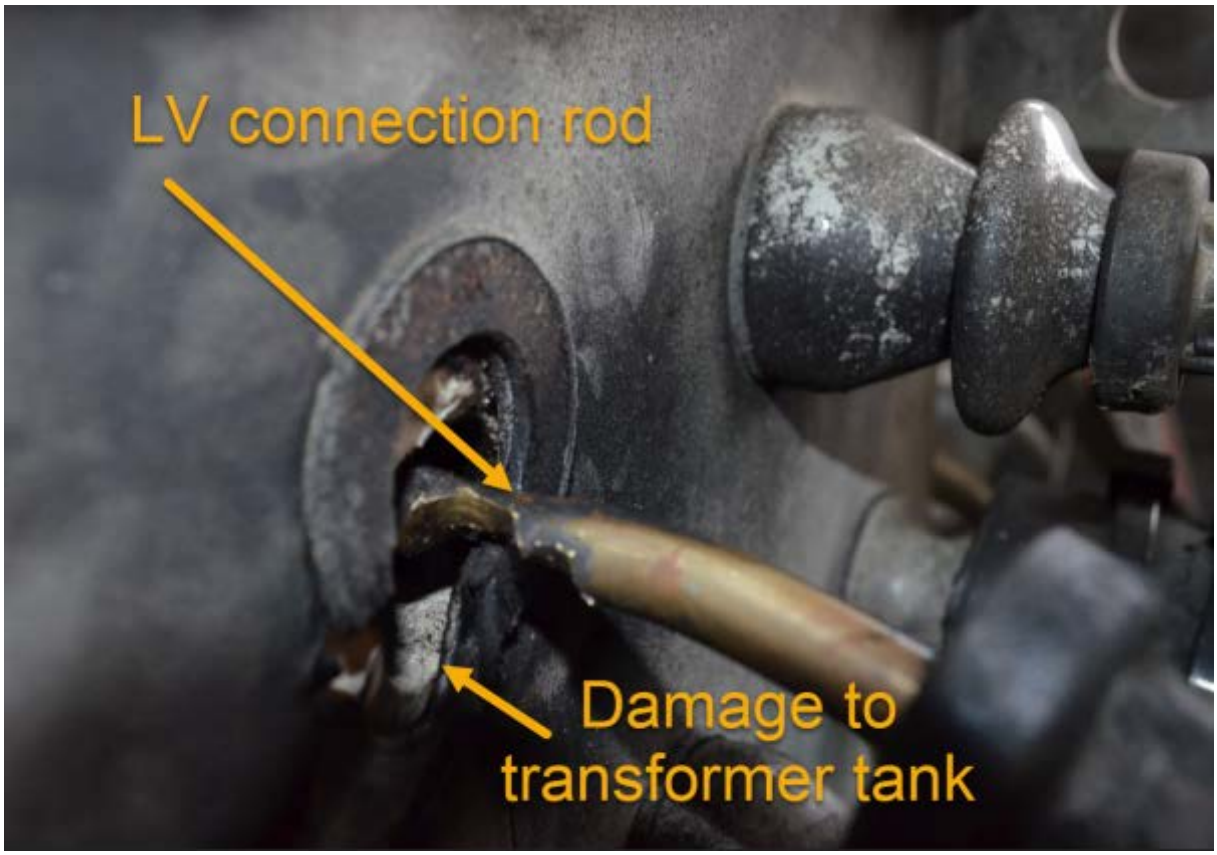
- the HV earthing cable attached to the transformer tank has signs of being heated up leaving a char mark on the surface of the pole due to the heating caused by the LV contact.

## Inspection of Transformer Pole 8

On 8 June 2018 the investigating officer from ESV inspected the transformer that was quarantined at the Powercor depot in Colac.

This inspection identified that at least half of the internal LV connection rod that attached to the LV terminal bushing had been melted away. This damage is consistent with the contact of the rod to the transformer tank. The transformer tank also showed signs of damage due to an arcing event as shown in Figure 6.

**Figure 6: Damage to transformer**




## Powercor Australia Limited protection system

As previously stated the cause of this incident was the failure and the resultant transformer LV active connection rod contacting the earthed transformer tank. The upstream 6K[5] HV EDO fuse (to protect the pole top transformer from a fault) operated in this instance. ESV calculates (from the network fault level data provided by Powercor on 29 June 2018) that the HV fuses would have operated within 700 milliseconds.

ESV's assessment of the HV protection system coordination show that the fuse size at the transformer was sufficient to clear a hard phase to ground fault at the fault levels provided by Powercor. However, depending on the nature of the arcing scenario the upstream fusing may not operate as a result of any intermittent contact that created less than 6-12 Amps arcing current.

[5] 6K HV EDO Fuse - 6amp rated, "K" refers to the speed category classification, high voltage, expulsion drop out fuse.

No evidence exists to show the fault current at the time of fuse operation and time taken for the fuse to operate. Therefore, it is impossible to arrive at a definitive conclusion about the integrity of fuse operation. It is noteworthy that electricity network protection equipment such as HV fuses, ACRs and feeder circuit breakers are primarily designed to protect the electrical network/assets from damage, and not specifically to prevent fire ignition.

The HV earthing cable in this instance would convey the current to earth due to the active LV transformer conductor making physical contact with the transformer tank which is connected to the HV earth. The contact point is before the LV fuses, so they would not operate.

ESV concludes that Powercor's protection system operated as expected.

## Powercor report

An incident notification report (20180321PWA_01) was received by ESV from Powercor on 21 April 2018 regarding the failure of a tree branch causing a fire. The report details that "a tree contacted an LV service that crossed a road and resulted in damage to wiring on pole mounted substation."

The details of the incident notification report are consistent with observations and statements made by the property owners to ESV during the site visit on 13 April 2018.

## Statement from property owners

On 8 June 2018 the investigating officer from ESV met with the property owners of 114 Cross Forest Road and obtained a witness statement that included:

- the property owners observed multiple arc events (like an arc welder) coming from Tx P8 after the service cable had been struck
- the property owners observed the fire initiate at the base of Tx P8 in a short period of time following the arcing events
- the weather condition were very windy and gusty.

# Google Maps image review

A search and review of images provided by Google maps[6] shows the site and that the tree branches were well clear of the service cable at that time the photograph was taken (March 2010). The image also confirms that the failed tree branch was significant in length and height.

### Figure 7: Google maps screen capture

Figure 8 below (Google maps image) shows the distances marked up from Google and LiDAR information sourced as part of the investigation.

### Figure 8: Marked up image with distances


[6] https://www.google.com.au/maps/@-38.2252579,143.0812259,3a,75y,236.03h,105.69t/data=!3m6!1e1!3m4!1sCzTElVImtU3bh4wFSnlC6w!2e0!7i13312!8i6656 as viewed 19 June 2018

# LiDAR Information from Powercor

Powercor provided ESV with a copy of the most recent LiDAR (Light Detection and Ranging) measurements recorded for the incident site, from flight data recorded in 2017. The data indicates that the closest vegetation was assessed at 3.5 metres horizontally from the service line. See Figure 9 below.

**Figure 9: LiDAR image of site provided by Powercor**


From the above Google and LiDAR information provided, along with other images obtained and reviewed ESV is satisfied that the minimum clearance requirements as required by the Electricity Safety (Electric Line Clearance) Regulations 2015 were maintained prior to the incident.

# Electricity Safety (Electric Line Clearance) Regulations 2015

Section 84 of the Electricity Safety Act 1998 identifies Powercor as responsible for keeping trees appropriately clear of the electric line that is the subject of this technical investigation report. The electric line has been identified to be an insulated electric line.

Section 24 and Graph 1 of the Code of Practice for Electric Line Clearance (the Code) prescribe the minimum distance that trees should be kept clear from insulated electric lines. The Code is a schedule to the Electricity Safety (Electric Line Clearance) Regulations 2015 vegetation.

Sub clause (3) states that “The applicable distance for the first and last sixths of the span is 300mm”. The tree of concern existed within the first sixth of the span therefore a minimum clearance distance of 300mm was required in all directions from the service line.

From the information provided by Powercor, site observations made and review of available images ESV is satisfied that the minimum clearance distance had been maintained prior to the incident.

# Prevailing weather information

## Bureau of Meteorology Information

On the afternoon of 17 March 2018 damaging winds passed though the Terang area and South West region of Victoria.

The closest weather station to the investigation site was Mortlake. The information from this station has been collected by accessing the Bureau of Meteorology Internet site.

Figure 10 shows that Mortlake weather station records recorded on 17 March 2018 at 20:08 winds with a maximum gust of 104 km/h coming from a North Westerly direction.

### Figure 10: Excerpt from the Mortlake weather record for March 2018

**Mortlake, Victoria**
**March 2018 Daily Weather Observations**

| Date | Day | Temps | | Rain | Evap | Sun | Max wind gust | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Min | Max | | | | Dirn | Spd | Time |
| | | °C | °C | mm | mm | hours | | km/h | local |
| 1 | Th | 13.3 | 22.2 | 1.0 | | | SSW | 37 | 14:41 |
| 2 | Fr | 7.9 | 28.9 | 0 | | | ENE | 22 | 09:54 |
| 3 | Sa | 11.6 | 24.6 | 0 | | | SW | 46 | 15:01 |
| 4 | Su | 9.7 | 20.8 | 0 | | | SW | 35 | 13:36 |
| 5 | Mo | 4.4 | 22.0 | 0 | | | SSW | 43 | 13:42 |
| 6 | Tu | 5.1 | 25.1 | 0 | | | S | 37 | 15:18 |
| 7 | We | 6.3 | 31.1 | 0 | | | S | 33 | 16:01 |
| 8 | Th | 8.2 | 32.7 | 0 | | | S | 35 | 16:26 |
| 9 | Fr | 9.3 | 34.9 | 0 | | | SSW | 37 | 15:46 |
| 10 | Sa | 12.4 | 37.7 | 0 | | | WNW | 37 | 14:02 |
| 11 | Su | 12.0 | 23.6 | 0 | | | S | 39 | 16:31 |
| 12 | Mo | 13.5 | 20.4 | 0 | | | SSW | 41 | 13:41 |
| 13 | Tu | 13.1 | 21.9 | 0 | | | SSW | 35 | 14:29 |
| 14 | We | 13.0 | 22.9 | 0 | | | SW | 43 | 14:09 |
| 15 | Th | 6.4 | 22.4 | 0 | | | SW | 31 | 16:22 |
| 16 | Fr | 5.5 | 26.4 | 0 | | | WNW | 35 | 13:26 |
| 17 | Sa | 10.7 | 34.0 | 0 | | | NW | 104 | 20:08 |
| 18 | Su | 12.5 | 21.1 | 0.4 | | | WNW | 76 | 11:28 |
| 19 | Mo | 9.1 | 23.5 | 0.2 | | | W | 57 | 12:36 |
| 20 | Tu | 11.7 | 17.1 | 3.0 | | | SSE | 41 | 17:10 |
| 21 | We | 8.2 | 23.1 | 0.2 | | | E | 59 | 09:16 |

See Appendix A for more information.

# Findings and conclusions

ESV's findings and conclusions specifically relate to the source of the Gnotuk Fire (Camperdown–Bullen Merri Fire) and the role played by the electricity infrastructure.

## The source of the Gnotuk Fire

ESV concludes that the fire ignition was caused by molten metal fragments falling to the ground as a consequence of the active transformer wiring making contact with the earthed transformer tank (casing).

The factors contributing to the fire ignition are:

1. a tree branch on the west side of Cross Forest Rd failed and contacted an LV service cable that was attached between a service pole and Tx P8
2. this caused the service clamping fittings to break away at Tx P8, resulting in stress on the transformer LV bushings due to the LV cables being pulled
3. this in turn caused in the failure/breakage of the transformer's active LV bushing, and
4. this resulted in the transformer LV active lead contacting the earthed tank (casing) of the transformer creating an arcing event.
5. molten material dropped to the ground starting the fire in the dry grass.

## Powercor Australia Limited protection system

The resulting event of a transformer LV active connection rod contacting a HV earth component is likely to initiate a HV fuse operation after an appropriate timeframe. Electricity network protection equipment such as HV fuses, ACRs and feeder circuit breakers are primarily designed to protect the electrical network/assets from damage, and not specifically to prevent fire ignition.

The HV earthing cable in this instance would convey the current to earth until the transformer HV fuses operated, provided the current remains within the performance limits (time and current) of the transformer HV fuse and upstream HV fuses, and Zone Substation feeder circuit breaker.

## Vegetation clearances

From the evidence gathered and analysed, ESV concludes that the failed branch fell and made contact with the LV service line near the service pole on the west side of Cross Forest.

ESV assessed that the point of failure of the tree branch was 6.6 metres horizontally away from the service cable, where the minimum clearance distance required by the Code of Practice for Electric Line Clearance is 300mm.

ESV has determined the failed branch was compliant at the time of the incident, however due to its height it was sufficient in length to contact the service line when the branch failed.

Therefore ESV will not be conducting any further investigation into this incident.

# Appendix A – Weather Observations

**Mortlake, Victoria**
**March 2018 Daily Weather Observations**

Australian Government
Bureau of Meteorology

| Date | Day | Temps | | Rain | Evap | Sun | Max wind gust | | | 9am | | | | | | 3pm | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min | Max | | | | Dirn | Spd | Time | Temp | RH | Cld | Dirn | Spd | MSLP | Temp | RH | Cld | Dirn | Spd | MSLP |
| | | °C | °C | mm | mm | hours | | km/h | local | °C | % | eighths | | km/h | hPa | °C | % | eighths | | km/h | hPa |
| 1 | Th | 13.3 | 22.2 | 1.0 | | | SSW | 37 | 14:41 | 14.0 | 98 | | S | 13 | 1018.1 | 21.0 | 56 | | SW | 15 | 1017.7 |
| 2 | Fr | 7.9 | 28.9 | 0 | | | ENE | 22 | 09:54 | 14.5 | 100 | | NE | 9 | 1015.7 | 26.2 | 32 | | NE | 7 | 1012.1 |
| 3 | Sa | 11.6 | 24.6 | 0 | | | SW | 46 | 15:01 | 18.3 | 60 | | WNW | 13 | 1008.7 | 23.1 | 50 | | WSW | 28 | 1009.9 |
| 4 | Su | 9.7 | 20.8 | 0 | | | SW | 35 | 13:36 | 13.1 | 100 | | | Calm | 1016.9 | 19.8 | 46 | | SSW | 20 | 1016.8 |
| 5 | Mo | 4.4 | 22.0 | 0 | | | SSW | 43 | 13:42 | 11.2 | 100 | | SSW | 2 | 1020.3 | 19.6 | 41 | | S | 20 | 1021.4 |
| 6 | Tu | 5.1 | 25.1 | 0 | | | S | 37 | 15:18 | 14.8 | 80 | | SSE | 17 | 1025.7 | 24.0 | 42 | | S | 22 | 1024.0 |
| 7 | We | 6.3 | 31.1 | 0 | | | S | 33 | 16:01 | 14.4 | 100 | | ENE | 7 | 1025.9 | 30.1 | 26 | | SSW | 6 | 1023.2 |
| 8 | Th | 8.2 | 32.7 | 0 | | | S | 35 | 16:26 | 17.9 | 74 | | NNE | 4 | 1024.8 | 31.9 | 23 | | S | 15 | 1022.1 |
| 9 | Fr | 9.3 | 34.9 | 0 | | | SSW | 37 | 15:46 | 18.1 | 75 | | NNE | 2 | 1025.6 | 33.2 | 17 | | SSW | 7 | 1022.7 |
| 10 | Sa | 12.4 | 37.7 | 0 | | | WNW | 37 | 14:02 | 20.3 | 46 | | NNE | 9 | 1023.7 | 35.8 | 12 | | W | 17 | 1020.9 |
| 11 | Su | 12.0 | 23.6 | 0 | | | S | 39 | 16:31 | 18.4 | 83 | | SSW | 19 | 1024.1 | 20.6 | 54 | | S | 22 | 1024.4 |
| 12 | Mo | 13.5 | 20.4 | 0 | | | SSW | 41 | 13:41 | 15.2 | 68 | | SSW | 15 | 1024.6 | 18.1 | 58 | | SSW | 24 | 1023.6 |
| 13 | Tu | 13.1 | 21.9 | 0 | | | SSW | 35 | 14:29 | 15.3 | 79 | | SSW | 9 | 1024.2 | 20.7 | 46 | | SSW | 20 | 1022.7 |
| 14 | We | 13.0 | 22.9 | 0 | | | SW | 43 | 14:09 | 15.5 | 64 | | SSE | 7 | 1021.1 | 22.0 | 43 | | SSW | 15 | 1017.6 |
| 15 | Th | 6.4 | 22.4 | 0 | | | SW | 31 | 16:22 | 10.6 | 95 | | W | 4 | 1015.4 | 20.5 | 51 | | SSW | 20 | 1015.3 |
| 16 | Fr | 5.5 | 26.4 | 0 | | | WNW | 35 | 13:26 | 10.7 | 100 | | NE | 6 | 1016.1 | 24.4 | 34 | | NNW | 15 | 1012.5 |
| 17 | Sa | 10.7 | 34.0 | 0 | | | NW | 104 | 20:08 | 19.9 | 60 | | N | 17 | 1010.4 | 31.1 | 25 | | N | 46 | 1005.7 |
| 18 | Su | 12.5 | 21.1 | 0.4 | | | WNW | 76 | 11:28 | 13.0 | 81 | | WNW | 35 | 1005.3 | 19.1 | 34 | | WSW | 35 | 1011.0 |
| 19 | Mo | 9.1 | 23.5 | 0.2 | | | W | 57 | 12:36 | 14.9 | 80 | | NW | 30 | 1013.9 | 21.7 | 53 | | WNW | 31 | 1013.9 |
| 20 | Tu | 11.7 | 17.1 | 3.0 | | | SSE | 41 | 17:10 | 12.8 | 72 | | S | 9 | 1027.0 | 15.3 | 53 | | SSE | 28 | 1028.7 |
| 21 | We | 8.2 | 23.1 | 0.2 | | | E | 59 | 09:16 | 14.9 | 68 | | E | 30 | 1028.3 | 22.4 | 45 | | E | 35 | 1025.0 |
| 22 | Th | 13.1 | 30.8 | 0 | | | E | 50 | 00:25 | 15.2 | 73 | | ENE | 15 | 1024.8 | 28.5 | 31 | | NNE | 11 | 1020.7 |
| 23 | Fr | 14.1 | 31.1 | 0 | | | NNE | 46 | 11:26 | 18.9 | 56 | | NNE | 15 | 1020.8 | 30.0 | 27 | | NNE | 26 | 1015.9 |
| 24 | Sa | 16.7 | 28.0 | 13.4 | | | W | 44 | 04:08 | 17.3 | 100 | | NNE | 7 | 1013.3 | 25.7 | 42 | | WNW | 9 | 1009.1 |
| 25 | Su | 15.2 | 22.6 | 0 | | | W | 85 | 15:26 | 16.5 | 89 | | NW | 30 | 1001.5 | 21.0 | 35 | | WNW | 44 | 999.2 |
| 26 | Mo | 6.8 | 17.3 | 3.0 | | | WSW | 59 | 09:53 | 11.2 | 85 | | W | 20 | 1009.0 | 15.7 | 65 | | W | 22 | 1012.0 |
| 27 | Tu | 6.0 | 22.2 | 0 | | | N | 35 | 10:52 | 9.1 | 98 | | NNE | 6 | 1016.4 | 19.5 | 42 | | N | 15 | 1012.5 |
| 28 | We | 9.1 | 24.7 | 0 | | | N | 46 | 02:26 | 19.6 | 34 | | WNW | 22 | 1011.6 | 24.0 | 51 | | WSW | 15 | 1013.9 |
| 29 | Th | 12.8 | 23.4 | 0 | | | WSW | 37 | 13:11 | 14.8 | 73 | | NW | 7 | 1017.5 | 21.5 | 43 | | WSW | 13 | 1015.0 |
| 30 | Fr | 10.9 | 22.4 | 0 | | | SW | 43 | 10:23 | 14.6 | 92 | | WNW | 13 | 1016.0 | 21.5 | 49 | | SW | 26 | 1016.8 |
| 31 | Sa | 6.3 | 22.6 | 0 | | | SSW | 24 | 16:11 | 10.2 | 100 | | N | 4 | 1019.3 | 20.8 | 38 | | WNW | 11 | 1016.4 |
| **Statistics for March 2018** | | | | | | | | | | | | | | | | | | | | | |
| Mean | | 10.2 | 25.2 | | | | | | | 15.0 | 80 | | | 12 | 1018.3 | 23.5 | 40 | | | 20 | 1016.9 |
| Lowest | | 4.4 | 17.1 | | | | | | | 9.1 | 34 | | | Calm | 1001.5 | 15.3 | 12 | | SSW | 6 | 999.2 |
| Highest | | 16.7 | 37.7 | 13.4 | | | NW | 104 | | 20.3 | 100 | | WNW | 35 | 1028.3 | 35.8 | 65 | | N | 46 | 1028.7 |
| Total | | | | 21.2 | | | | | | | | | | | | | | | | | |

Observations were drawn from Mortlake Racecourse (station 090176)

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