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Victorian Assets Bushfire Mitigation Plan

FOR PUBLIC | Revision May 2020

Document Control					
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Approver:	Head of Asset Management				

Revision no	Approved by	Date	Amendment
1	EM / Network Planning and Operations	x	Moved to Revision 1 Transgrid Approval following ESV approval. Version identical to 0.6b
2	Head of Asset Management	x	Updated Sections 1 to 4 to address Kiamal Terminal Station. Appendix B updated to reflect currently active standard jobs. Appendix F added to include Kiamal Terminal Station specific information to manage bushfire risk exposure.
3	Head of Asset Management	5 Aug 2020	Included Berrybank Terminal Station Note: This is a public version identical to the full version with removal of items not prescribed by legislation.

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1. Summary

1. Summary

This plan outlines Transgrid's plan to mitigate bushfire risks for the following Victorian Assets:

- Deer Park Terminal Station (DPTS)
- Kiamal Terminal Station (KMTS)
- Berrybank Terminal Station (BBTS)
- Berrybank Substation (BBW)
- Berrybank Transmission Line (BBTS-BBWF)

The plan also addresses risks, which occur during the fire danger periods. This Bushfire Mitigation Plan supports the effective management of these risks to an acceptable risk level in accordance with Transgrid's business wide Bushfire Formal Safety Assessment.

The Plan demonstrates compliance with Section 113A (1) of the Victorian Electricity Safety Act 1998 (incorporating amendments as at 1 January 2012) that requires that a major electricity company must prepare and submit to Energy Safe Victoria (ESV), for acceptance under this Division, a plan for the company's proposals for mitigation of bushfire in relation to the company's supply network at the end of each period of 5 years commencing on the latter of:

a) The date when the accepted bushfire mitigation plan is first accepted under this Division; or

b) The date of the most recent acceptance of a revision of the accepted bushfire mitigation plan submitted under this Division.

In accordance with the Electricity Safety (Bushfire Mitigation) Regulations 2013, this Plan provides the prescribed particulars as specified in Section 7.

A copy of the approved Transgrid Victorian Assets Bushfire Mitigation Plan will be published on the Transgrid website (www.Transgrid.com.au). This public version of the Plan is consistent with the full version of the plan approved by ESV on 27 May 2020 and contains the information required to be made public under s. 7A of the Electricity Safety (Bushfire Mitigation) Regulations 2013.

A copy of the accepted and current Bushfire Mitigation Plan will be available on site at Victorian Network Assets by arrangement and at Transgrid's offices located at:

Level 11, 470 Collins Street, Melbourne VIC 3000

The Plan is a living document and will evolve as the fire danger period approaches each year. Appendices to this document will be reviewed and additional information may be added to the appendices as it becomes available.

2. Abbreviations and Definitions

Table 1 Abbreviations Abbreviation Phrase

AFAP	As Far As Practicable
BMP	The Victorian Assets Bushfire Mitigation Plan in accordance with the Electricity Safety (Bushfire Mitigation) Regulations 2013
BBTS	Berrybank Terminal Station
BBW	Berrybank Substation
BBTS-BBWF	Berrybank Transmission Line
CAMMS	Incident, Audit, Risk and Compliance System.
Contractor	Service provider that provides first response, emergency services and/or maintenance services for Transgrid at Victorian Network Assets.
CFA	Victorian Country Fire Authority
CREMP	Corporate Response and Emergency Management Plan
DHWA	Designated Hot Work Area
DPTS	Deer Park Terminal Station
ELCMP	Electricity Line Clearance Management Plan in accordance with the Electricity Safety (Electric Line Clearance) Regulations 2015
ENSMS	The Electricity Network Safety Management System and associated formal safety assessments developed by Transgrid under the NSW Electricity Supply (Safety and Network Management) Regulation 2014
EPIRB	Emergency Position Indicating Radio Beacon
ESMS	Electricity Safety Management Scheme in accordance with the Electricity Safety (Management) Regulations 2009 Division 1
ESV	Energy Safe Victoria, the Victorian technical and safety regulator
FDP	Fire Danger Period means a period declared under section 4 of the Country Fire Authority Act 1958 to be a fire danger period
FSA	Formal Safety Assessment as defined under AS5577
HSMS	Health and Safety Management System that is compliant with AS4801
LVMPRI	LV/MECH Preparation and Restoration Instruction
KMTS	Kiamal Terminal Station
OM	Operating Manual
PSSR	Transgrid's Power System Safety Rules (refer Definitions) which includes Safe Approach Distance for working on or near Transgrid's assets that are equal to or greater than that required in the Blue Book
PSERP	Power System Emergency Response Plan
SCADA	Supervisory Control and Data Acquisition System
TFB day	Total fire ban day means a day that has been declared to be a day of total fire ban under section 40(1) of the Country Fire Authority Act 1958
TSS	Transgrid Spatial System

Table 2 Definitions

Term	Definition
As Far As Practicable	The reduction of risk in accordance with the Victorian Safety Act (1998) Section 83 and Part 10. This level of reduction is exceeds the requirements for meeting ALARP under AS5577.
Asset Bushfire Information	Network Assets specific bushfire information that is contained in the appendix for each Network Asset.
Asset Maintenance Plan	The term refers to both the prescribed and non-prescribed asset maintenance plan (this includes the Deer Park Terminal Station Maintenance Plan). These documents describes the activities and intervals required for maintenance and inspection activities at NSW, ACT and Victorian Network Assets. The Asset Manager owns the two documents in Transgrid. The non-prescribed asset maintenance plan details the exclusions/exceptions to the prescribed asset maintenance plans that apply to the Victorian Network Assets.
Authorisation System	Transgrid's Authorisation System is an online system which performs the traditional approval to work function whilst ensuring access to areas is only granted to authorised and competent persons. The Authorisation System is integrated with the Transgrid's enterprise resource planner system (Ellipse) to ensure competencies managed through Authorisation System are up to date. Transgrid currently use an in-house system called Authorisation to Work (ATW) to perform this process.
Bushfire Risk Area	Country Fire Authority (CFA) classifies Bushfire Risk Area into one of the three categories: • High • Low • Undefined Figure 2 Bushfire risk area coverage in Victoria as defined by CFA.
Contractor	First response, emergency and maintenance related service provided to Transgrid to respond to manage the asset on behalf of Transgrid via a signed contract.
Element	A single manageable logical entity of electricity transmission network. Network elements are: • Transmission lines • High voltage underground cables • Substations, including buildings at substations, such as a secondary systems building • Radio repeater sites Secondary systems (also referred to as automation and metering systems).
ESMS	The specific document within Transgrid required by ESV for the identification or hazards and associated controls to ensure that safety risks are managed As Far as Practicable in line with the Victorian Electricity Safety Act (1998)
Fire Danger Period	CFA declares the Fire Danger Period (FDP) for each municipality (shire or council) at different times in the lead up to the fire season. It depends on the amount of rain, grassland curing rate and other local conditions. Transgrid has declared the start of fire danger period across NSW, ACT and Victorian networks as 1st of September. This is to address the various start dates across Victoria, and assist in maintenance planning to complete high bushfire risk maintenance work before the start of the 1st of September. Transgrid has declared the end of fire danger period as 31st of March, due to the various end dates across Victoria and to assist in reporting on bushfire performance.

Term	Definition
Network Assets	The Transgrid Network Assets that are within the scope of Transgrid's ESMS and this Victorian Assets Bushfire Mitigation Plan. For this revision of the ESMS this includes: • Deer Park Terminal Station • Kiamal Terminal Station • Berrybank Terminal Station • Berrybank Substation • Berrybank Terminal Station to Berrybank Substation 220kV line.
Substation	General term for a facility in the electricity network that transforms electricity from one voltage to another and/or transfers electricity from a generator to the TNSP, and/or transfers electricity to a consumer or DNSP.
The Act	Electricity Safety Act 1998 (Victoria)
The Regulation	Electricity Safety (Bushfire Mitigation) Regulations 2013
The Wire	Transgrid's intranet that contains readily available information for employees

3. Compliance Information

Section 4 of this document has been structured in line with the Electricity Safety (Bushfire Mitigation) Regulations 2013 (the Regulations)[1] to assist with demonstrating compliance as shown in Table 3.

Note that this is the publicly available version of the plan and contains the content required s. 7A of the Electricity Safety (Bushfire Mitigation) Regulations 2013. The included information is consistent with the full version of the plan approved by ESV.

Table 3 Compliance Reference Table

Regulation	7 – Prescribed particulars for bushfire mitigation plans – major electricity companies	Location in BMP
7(1)(a)	the name, address and telephone number of the major electricity company;	Section 4.4
7(1)(b)	the position, address and telephone number of the person who was responsible for the preparation of the plan;	Section 4.4
7(1)(c)	the position, address and telephone number of the persons who are responsible for carrying out the plan;	Section 4.4
7(1)(d)	the telephone number of the major electricity company's control room so that persons in the room can be contacted in an emergency that requires action by the major electricity company to mitigate the danger of bushfire;	Section 4.4
7(1)(e)	the bushfire mitigation policy of the major electricity company to minimise the risk of fire ignition from its supply network;	Section 4.5
7(1)(f)	the objectives of the plan to achieve the mitigation of fire danger arising from the major electricity company's supply network;	Section 4.6
7(1)(g)	a description, map or plan of the land to which the bushfire mitigation plan applies;	Section 4.7
7(1)(h)	the preventative strategies and programs to be adopted by the major electricity company to minimise the risk of the major electricity company's supply networks starting fires;	Section 4.8
7(1)(ha)	details of the preventative strategies and programs referred to in paragraph (h) (including details in relation to timing and location) by which the major electricity company will ensure that: (i) in its supply network, each polyphase electric line originating from a selected zone substation has the required capacity; and (ii) on and from 1 May 2023, in its supply network, each polyphase electric line originating from every zone substation specified in Schedule 2 has the required capacity;	Section 4.9
7(1)(hb)	details of testing that will be undertaken before the specified bushfire risk period each year by which the major electricity company will ensure that its supply network can operate to meet the required capacity in relation to each polyphase electric line in accordance with paragraph (ha);	Section 4.10

[1] http://www.legislation.vic.gov.au/domino/Web_Notes/LDMS/LTObject_Store/ltobjst9.nsf/DDE300B846EED9C7CA257616000A3571/633C43B024A8E558CA257FA3007AD2ED/$FILE/13-62sra004%20authorised.pdf

Regulation	7 – Prescribed particulars for bushfire mitigation plans – major electricity companies	Location in BMP
7(1)(hc)	details of the preventative strategies and programs referred to in paragraph (h) (including details in relation to timing and location) by which the major electricity company will ensure that, on and from 1 May 2016, within an electric line construction area, each electric line with a nominal voltage of between 1 kV and 22 kV that is constructed, or is wholly or substantially replaced, in its supply network is a covered or underground electric line;	Section 4.11
7(1)(hd)	details of the processes and procedures by which the major electricity company will ensure that, before 1 May 2023, the major electricity company has installed an Automatic Circuit Recloser in relation to each SWER line in its supply network;	Section 4.12
7(1)(j)	details of the processes and procedures for ensuring that each person who is assigned to carry out inspections referred to in paragraph (i) and of private electric lines has satisfactorily completed a training course approved by Energy Safe Victoria and is competent to carry out such inspections;	Section 4.14
7(1)(k)	details of the processes and procedures for ensuring that persons (other than persons referred to in paragraph (j) who carry out or will carry out functions under the plan are competent to do so;	Section 4.15
7(1)(l)	the operation and maintenance plans for the major electricity company's supply network: • during a total fire ban day; and • during a fire danger period;	Section 4.16
7(1)(m)	the investigations, analysis and methodology to be adopted by the major electricity company for the mitigation of the risk of fire ignition from its supply network;	Section 4.17
7(1)(n)	details of the processes and procedures by which the major electricity company will: • monitor the implementation of the bushfire mitigation plan; and • audit the implementation of the plan; and • identify any deficiencies in the plan or the plan's implementation; and • change the plan and the plan's implementation to rectify any deficiencies identified under subparagraph (iii); and • monitor the effectiveness of inspections carried out under the plan; and • audit the effectiveness of inspections carried out under the plan;	Section 4.18
7(1)(o)	the policy of the major electricity company in relation to the assistance to be provided to fire control authorities in the investigation of fires near the major electricity company's supply network;	Section 4.19
7(1)(p)	details of processes and procedures for enhancing public awareness of: • the responsibilities of the owners of private overhead electric lines that are above the surface of the land in relation to maintenance and mitigation of bushfire danger; • the obligation of the major electricity company to inspect private overhead electric lines that are above the surface of the land within its distribution area.	Section 4.20
7(1)(q)	a description of the measures to be used to assess the performance of the major electricity company under the plan.	Section 4.21

4. Bushfire Mitigation

4.1 Purpose

This Plan sets out how Transgrid will proactively mitigate bushfire risk leading up to and during the fire danger period at the Network Assets. This document has been communicated to both internal stakeholders, contractors, and will be communicated with CFA. The intention is to minimise bushfire risk AFAP at all times.

This document supports the ESMS in demonstrating the necessary bushfire risk controls as identified for each of the bushfire related key hazardous events.

This plan serves to demonstrate compliance with the Electricity Safety Act 1998 (the Act) and the Electricity Safety (Bushfire Mitigation) Regulations (the Regulation), and alignment with AS5577-2013: Electricity Network Safety Management Systems.

The relevant key hazardous events pertaining to bushfires at the Network Assets are as follows:

- Transmission line structure failure
- Transmission line conductor drop
- Clearance encroachment by vegetation
- Explosive failure of substation equipment
- Electrically induced fire
- Hot work and fire risk activities

The objectives of the Regulation are to ensure that network operators, such as Transgrid, take all reasonable steps to support the following:

- Safety of persons working on the network.
- Protection of property (whether or not belonging to a network operator).
- Management of safety risks arising from the protection of the environment.
- Management of safety risks arising from loss of electricity supply.

This document includes asset inspection, maintenance, vegetation management (buffer-zone and within the substation yard), performance monitoring and auditing. The planning and scheduling of the works supporting this plan is based principally on the system of asset inspection and maintenance reporting supported by a program of audits.

Transgrid is responsible for this Plan which is executed by Transgrid's internal staff, assisted by a first response contractor for the site:

- A 24 hour a day, 7 day a week first response service.
- Provision of switching and isolation services.
- Assistance with maintenance to the substation as called upon in accordance with Transgrid requirements.
- Site Management in the event of an Emergency (fulfil the Transgrid's nominated Site Controller role as part of the emergency management team as described in the Network Assets specific Emergency Response Manual. During the Emergency/Incident the Transgrid Site Controller shall be the first Authorised Person on site.

This Plan makes reference to other plans, manuals, standards, policies, procedures and work instructions that when combined with this Plan, cover all of the activities that contribute to the overall reduction of bushfire risk.

This Plan is available to all staff via Transgrid's intranet, The Wire, and a limited version on the Transgrid website http://www.Transgrid.com.au/).

As per s.113A(3) (b) a copy of this Plan is available at the Network Assets with agreement to meet on-site under agreement with Richard Manderson, Transgrid Substations Maintenance Manager, Perry Street, Yass NSW 2582 Ph: (02) 6226 9666 whom will deploy a representative to site when given three working days prior notice.

4.2 Background

Transgrid operates and maintains the major high voltage electricity transmission network in NSW and ACT connecting generators, distributors and major end users. Transgrid's network forms a major part of the backbone of the National Electricity Market (NEM), enabling energy trading between Australia's three largest states along the east coast and supporting the competitive wholesale electricity market. In addition to the above, Transgrid operate a number of 'Non-Prescribed' assets within Australia. These Network Assets are illustrated in Figure 1.

Transgrid has expanded its asset base to now include assets in Victoria by winning tenders with Customers in Victoria as part of its business growth activities. This results in companies within the Transgrid Group owning elements of the Victorian transmission network, refer to Table 4.

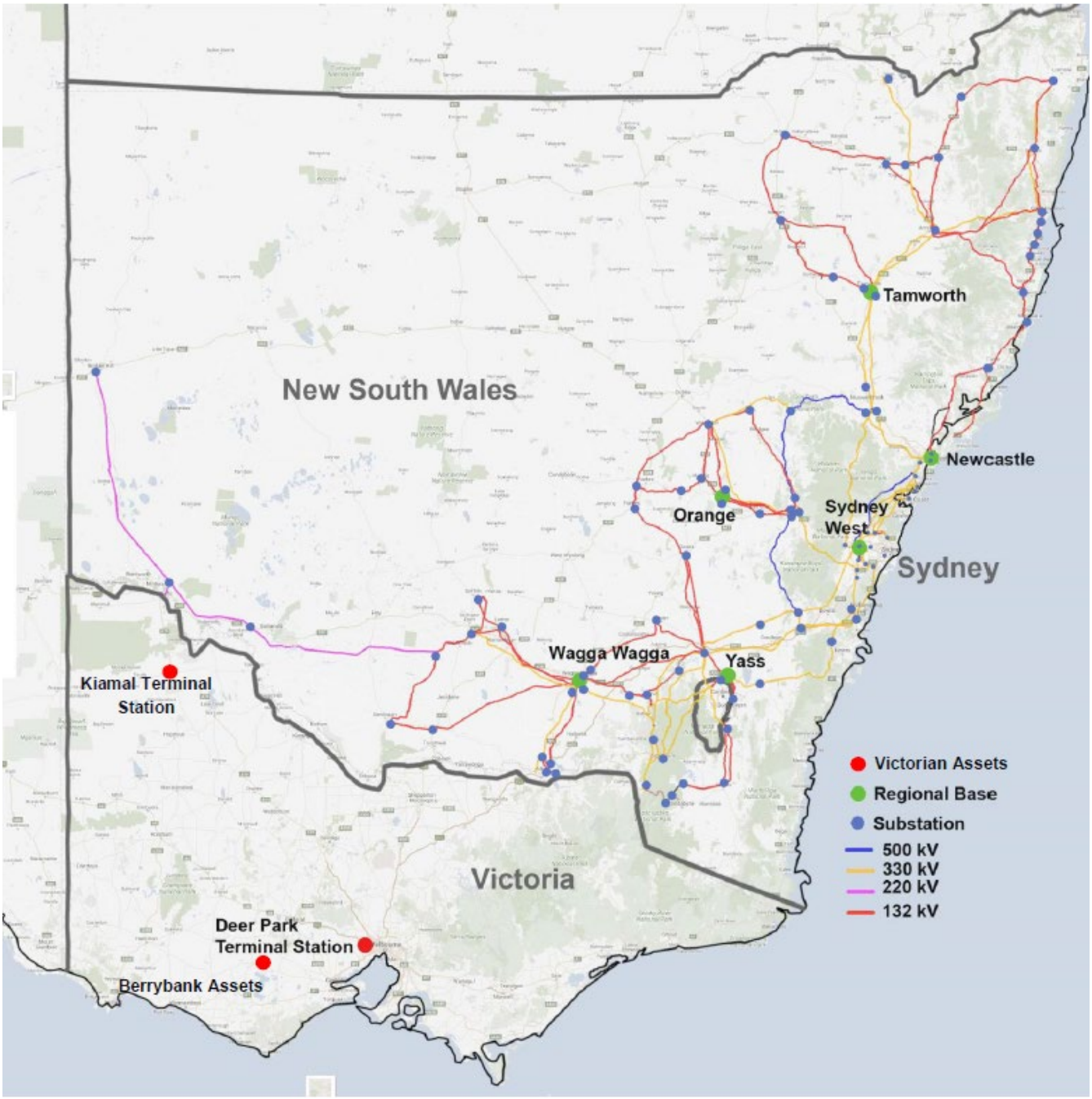
Table 4 Transgrid Group ownership of Victorian network elements

Legal Entity	Assets Owned
NSW Electricity Networks Operations Pty Ltd as trustee for NSW Electricity Networks Operations Trust	Deer Park Terminal Station (DPTS)
Transgrid Services Pty Limited as trustee for the Transgrid Services Trust	Kiamal Terminal Station (KMTS) Berrybank Terminal Station (BBTS) Berrybank Substation (BBW) Berrybank Transmission Line (BBTS-BBWF)

The operator of all assets in this Bushfire Mitigation Plan is NSW Electricity Networks Operations Pty Ltd as trustee for NSW Electricity Networks Operations Trust (Transgrid). Transgrid Services Pty Limited as trustee for the Transgrid Services Trust (TGS) and Transgrid have entered into a Management Services Agreement under which Transgrid will operate TGS owned assets under its processes and procedures for the management of network safety and bushfire mitigation.

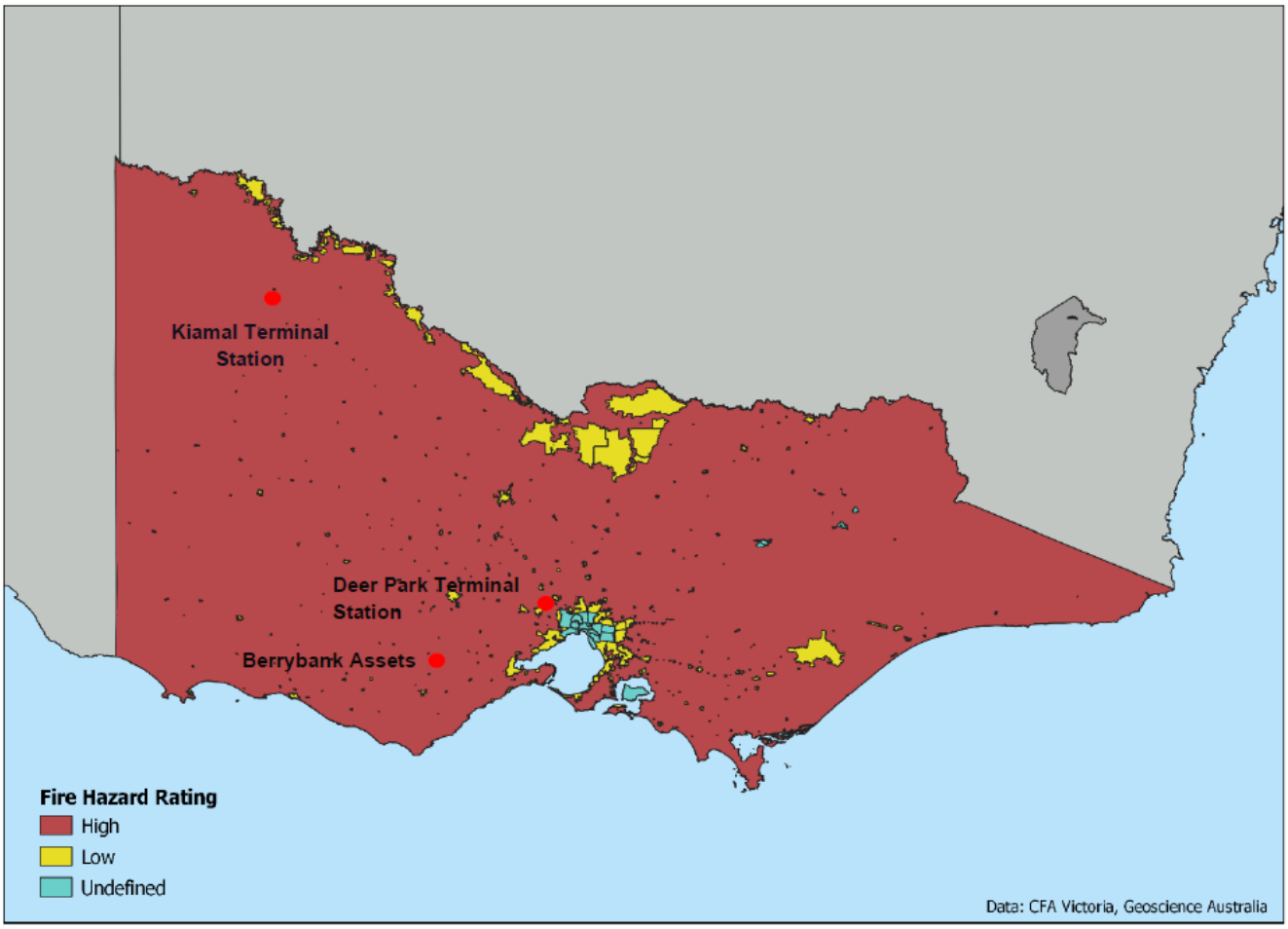
The assets owned by Transgrid and TGS and operated by Transgrid are collectively referred to as Network Assets in this document.

Figure 1 Transgrid's Australian Network



This Plan covers the assets listed in and identified at an approximate location as a red dot in and. The latter image illustrates that the assets are located on land categorised as a High Bushfire Risk Area.

Figure 2 Bushfire risk area coverage in Victoria[2]



4.3 Document structure

Section 4 addresses the information requirements required by the Regulation that are relevant to the assets within the scope of this plan.

Transgrid operates discrete groups of assets in Victoria and an appendix containing specific information 4for each is attached. These appendices will be referenced as Asset Bushfire Information in Section 4.

[2] Taken from http://mapshare.vic.gov.au/vicplan/, accessed on 26th of August 2019

4.4 Prescribed Particulars

For the purposes of section 113A(2)(b) of the Act, the following are the prescribed particulars related to sections 7(1)(a) – (da) of the Regulation:

Regulation Reference	Prescribed particular – contact details	Transgrid Information
7(1)(a)	the name, address and telephone number of the major electricity company	NSW Electricity Networks Operations Pty Ltd (ACN 609 169 959) as trustee for NSW Electricity Networks Operations Trust (ABN 70 250 995 390) (Transgrid) 180 Thomas Street Haymarket NSW 2000 T: (02) 9284 3000 (business hours only) Postal address: PO Box A1000 Sydney South NSW 1235
7(1)(b)	the position, address and telephone number of the person responsible for the preparation of the plan	Andrew McAlpine Asset Systems and Compliance Manager Network Planning and Operations Transgrid 180 Thomas Street Haymarket NSW 2000 T: (02) 9284 3000
7(1)(c)	the position, address and telephone number of the person responsible for carrying out the plan	Richard Manderson Substation Maintenance Manager Works Delivery Transgrid Perry Street Yass NSW 2582 T: (02) 6226 9625
7(1)(d)	the telephone number of the major electricity company's control room so that persons in the room can be contacted in an emergency that required action by the major electricity company to mitigate the danger of bushfire	Emergency Contact Number (open 24 hr): (02) 9620 0555
7(1)(da)	the telephone number of the major electricity company that members of the public can call in an emergency that requires action by the major electricity company to mitigate the danger of bushfire	Emergency Contact Number for general public (open 24 hr): 1800 027 253

4.5 Policy Statement

Bushfires pose an ever present risk to life, property and the environment throughout rural and urban areas. Bushfires can be caused by a variety of factors, including but not limited to lightning strikes, sparks from farm machinery and incinerators, vehicle crashes, and electrical incidents such as fallen power lines.

Transgrid is committed to managing bushfire risks As Far As Practicable associated within its entire electricity transmission Network Assets to meet the safety expectations of its customers and the wider community. This commitment is demonstrated through Transgrid's Corporate Risk Appetite Statement, Electricity Safety Management System (ESMS), Asset Management System (AMS), Health and Safety Management System (HSMS), and Environment Management System (EMS) and associated policies.

This Plan demonstrates compliance with Section 113A(1) of the Victorian Electricity Safety Act 1998 (incorporating amendments as at 1 January 2012). The ESMS has been developed for all Network Assets to demonstrate that control measures have been put in place, with respect to bushfire mitigation, which reduce these risks As Far As Practicable.

4.6 Objectives of the Bushfire Mitigation Plan

The objectives of this Plan are to:

- Minimise the risk of fires originating from within the Network Assets.
- Minimise the risk of damage to the Network Assets through an externally caused bushfire event.
- Achieve compliance with the relevant legislative requirements.
- Provide a structured approach to bushfire management that ensures that the risk of bushfire is either eliminated, or if this is not possible reduced as low as reasonably practicable.
- Provide the processes for prioritising corrective maintenance work orders prior and during the bushfire season.
- Demonstrate a high level of commitment to demonstrating Transgrid's proactive efforts in bushfire mitigation.

4.7 Description of the Land to which the Bushfire Mitigation Plan Applies

The following information is provided for each network asset in the Asset Bushfire Information:

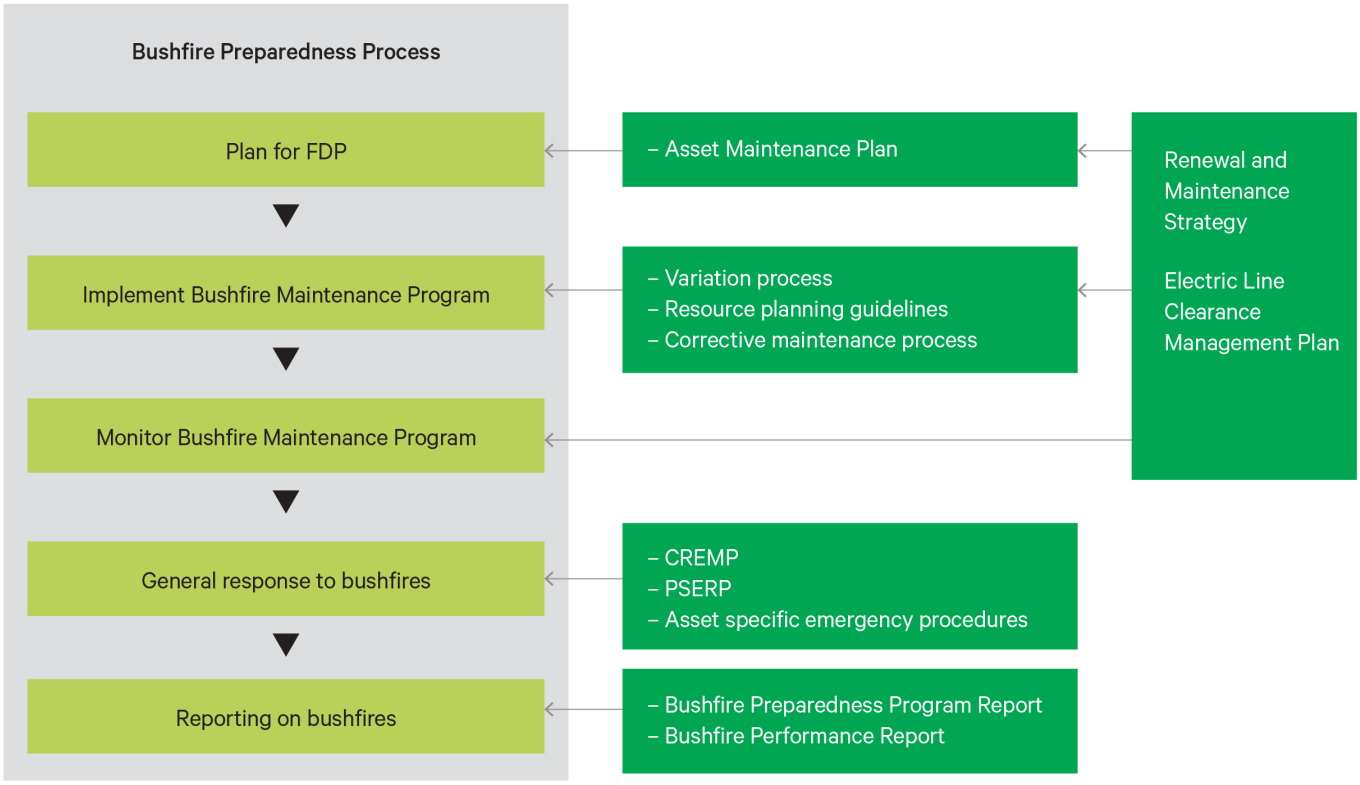
1. Location of asset.
2. Concise explanation of the environment surrounding the asset.
    a. Refer to the climatic conditions provided for each asset in the ESMS.
    b. An image of the asset in its environment.
3. Hazardous bushfire risk area identification of the asset.

4.8 Preventative Strategies to Minimise Bushfire Risk

4.8.1 Bushfire Preparedness Process

The overall process in managing Transgrid's bushfire risk to a risk level of AFAP is done through a bushfire preparedness process with the particular activities outlined in Figure 3.

Figure 3 Implementation of the Bushfire Mitigation Plan



4.8.2 Identification of Critical Assets

All assets have been assessed to determine if they are critical assets in the ESMS using the following criteria:

- Would failure of the asset contribute significantly to a key hazardous event occurring? or
- Does the asset contribute significantly to preventing or mitigating a key hazardous event?

Critical assets (i.e. assets that trigger one or both of the above conditions) are identified in the Critical Assets subsection in Asset Bushfire Information.

4.8.3 Development of Maintenance Plan – Process

Transgrid identifies critical hazards and identified critical controls for Network Assets in the ESMS. The critical controls for the bushfire related key hazardous event in the bushfire bow tie assessment is provided in Appendix A.

A list of these relevant to all Network Assets is provided in the full version of the plan. The lifecycle component it is related to, and how the controls are implemented are provided in this table. Equipment at each Network Asset that acts as a control is provided in the Critical Assets subsection of the Asset Bushfire Information.

The internal reporting on the performance of the bushfire maintenance program specified in the Bushfire Risk Management Plan (NSW compliance requirement) includes Victorian Network Assets. Thus, the internal

reporting is used to isolate the performance on managing bushfire risk from Victorian Network Assets. Thereporting on performance is outlined in the Bushfire Risk Management Plan.

4.8.4 Development of Maintenance Plan – Vegetation Management

The processes and procedures related to the management of vegetation around electric lines is found in Section 7.3 and 7.4 of Transgrid's 'Electric Line Clearance Management Plan 2020' (Rev 1) available on Transgrid's internal intranet and external internet site respectively.

4.8.5 Review Asset Maintenance Plan

The Asset Maintenance Plan is a preventative control used to prevent the key hazardous events starting a fire or impacting the network's reliability. The maintenance plan is reviewed to ensure that it minimises Transgrid's exposure to bushfire risk to a level of As Far As Practicable, as demonstrated in the ESMS.

Detailed inspection and maintenance tasks are scheduled with a frequency that aim to detect defects with sufficient warning to enable rectification prior to failure and with a focus on identifying longer term condition-related deterioration of assets.

Prior to each FDP, specific maintenance tasks are undertaken to provide a high degree of assurance that the assets do not present a bushfire risk. These maintenance tasks are prioritised and scheduled to assets with the highest bushfire risk, and scheduled to be completed prior to the start of the FDP. These activities are detailed in the Asset Maintenance Plan and Non-Prescribed Assets Maintenance Plan.

The maintenance plan provides guidelines for prioritising non-routine maintenance work to minimise Transgrid's bushfire risk exposure before and during the FDP.

Routine and Non-Routine Maintenance tasks are packaged for field action through a work order that is based on where possible a 'standard job'. A standard job has been created for each typical field task and can be either scheduled as 'routine maintenance' using a work order or available to use for 'corrective maintenance'. Identification of standard jobs and work orders are described in the full version of this plan.

4.8.6 Develop Routine Maintenance Program

A broad range of routine maintenance tasks are available to inspect the assets (example of such tasks listed below). The Victorian Asset routine maintenance tasks are stated in the relevant Asset Maintenance Plan and summarised in the Asset Bushfire Information. These include.

- Thermographic inspection of substation equipment
- Gutter inspections at substations and communication sites
- Easement inspection.

4.8.7 Develop Non-Routine Maintenance Program

Bushfire risk from non-routine maintenance work is managed in accordance with Corrective Maintenance Process document.

The non-routine maintenance program is based on defect standard jobs listed in the full version of this plan. A summary of the key tasks is included in the Asset Bushfire Information.

4.8.8 Implement Maintenance Program

General

The major activities involved in implementing the Asset Maintenance Plan and Non-Prescribed Assets Maintenance Plan are:

- The maintenance plan is monitored via a series of reports listed in the full version of this plan
- New bushfire work orders created after the release of the first report are tracked in the Maintenance Delivery Portal
- Changes in the program are handled using the Variation Process

- Prioritisation of overdue bushfire work orders in the lead up to and during the fire danger period is described in the following sections
- The Work Instructions managed by Works Delivery detail the processes appropriately skilled resources follow when executing the work orders
- Monitoring and auditing of the maintenance plan is covered in Section 4.18 of the full version of this plan
- The ongoing application of the maintenance plan is covered in section 4.18 of the full version of this plan.

Change in FDP

The changes in climatic conditions approaching summer season prompts early declarations of FDP by CFA, resulting in Transgrid performing additional risk review as follows:

> A bushfire risk review is performed on open (and overdue) bushfire work orders affected by the early declaration.

> The bushfire risk review is completed by the asset Maintenance Managers and is documented.

> The risk review involves the reviewing the appropriateness of the Planner Priority and Planned Finish Date in conjunction with bushfire risk information (bushfire risk category for routine work, bushfire consequence category for non-routine work, or type of hazardous bushfire risk area). Any changes are then implemented in Ellipse and tracked in the Maintenance Delivery Portal. Variations to Planner Priority are processed as per the Variation Process. Refer to Variation Process subsection below for more information.

The CFA declared early start of the FDP is communicated by HSE to field staff including contractors, which reminds staff to adhere to HSE bushfire risk related work practices, such as the Hot Work and Fire Risk Work Procedure document.

Staff use the following sources to identify any warnings and incidents regarding bushfire:

- Facebook (facebook.com/cfavi)
- Twitter (twitter.com/CFA_Updates)
- ABC local radio
- Sky News and other emergency broadcasters
- Victorian Bushfire Information Line (1800 240 667)
- 'Vic Emergency' application (http://www.emergency.vic.gov.au/respond/)

Variation Process

Any anticipated variation to Planner Priority and Required by Date data on bushfire work orders requires a variation request to be submitted as per the Variation Process document.

Variations may be triggered by:

- Significant scope added to work order
- Specific external factors, such as weather events, affecting delivery
- Bushfire danger period starts early
- Planner Priority is inappropriate for the work order
- Competing priorities of maintenance work required by this plan and business as usual maintenance work.

Changes to a Planned Finish Date does not require a variation request as it is updated by rescheduling the work.

Open and Overdue Work Orders

Works Delivery owns the Maintenance Delivery Portal, an online report that is updated daily, which is used to manage the performance of bushfire work orders, particularly overdue bushfire work orders. Appendix C provides guidelines on using the report to manage overdue bushfire work orders. The report is used in conjunction with the guidelines specified in the Asset Maintenance Plan for managing overdue bushfire work orders.

The prioritisation matrix, Table 5, is used to monitor the prioritisation of transmission line and easement open work orders, and help manage the backlog of these overdue bushfire work orders.

Table 5 Prioritisation of transmission line and easement maintenance work

Planner Priority on Work Order or Severity in Issue	Bushfire Risk or Consequence Categorisation				
	Category 1	Category 2	Category 3	Category 4	Category 5
P1	A	A	B	C	C
P2	A	B	C	C	D
P3	B	C	C	D	D
P4	C	D	D	D	D
P5	D	D	D	D	D

Bushfire risk dollar value is used for categorisation of transmission line and easement routine maintenance and inspection bushfire work orders into the five categories.

Bushfire consequence dollar value is used for categorisation of transmission line and easement defect bushfire work orders into the five categories.

A description of the Planner Priority is as follows:

- P1 – within 24 hrs.
- P2 – within 1 month.
- P3 – within 3 months.
- P4 – within 12 months.
- P5 – next outage or maintenance.

Description of the categories is as follows:

- Category 1: (pose greatest bushfire risk or consequence): assets ranked in the 80 (exclusive) – 100th percentiles in the total asset population in the network
- Category 2: assets ranked in the 60 (exclusive) – 80th percentiles in the total asset population in the network
- Category 3: assets ranked in the 40 (exclusive) – 60th percentiles in the total asset population in the network
- Category 4: assets ranked in the 20 (exclusive) – 40th percentiles in the total asset population in the network
- Category 5: (pose lowest bushfire risk/consequence): assets ranked in the 0 – 20th percentiles in the total asset population in the network

Actions are to occur as follows:

- A – Immediate action
- B – Action as soon as practicable following ‘A’ items

- C – Action following ‘B’ items
- D – Action following ‘C’ items

The prioritisation of substation, network property and other assets is based on the Bushfire Risk Area classification, ‘Yes’ in the report refers to High, and No in the report refers to Low. This is to help monitor the prioritisation of overdue work orders and manage backlog of overdue bushfire work orders.

4.9 Testing Plan for Polyphase Electric Lines

This is not applicable for the Network Assets as the minimum voltage of these assets is greater than 22 kV.

4.10 Testing Plan for Polyphase Electric Lines Prior to Bushfire Risk Period

This is not applicable for the Network Assets as the minimum voltage of these assets is greater than 22 kV.

4.11 Preventative Strategies for Lines within a Construction Area on and from 1 May 2016

This is not applicable for the Network Assets as the minimum voltage of these assets is greater than 22 kV.

4.12 Automatic Reclosers on SWER Lines

This is not applicable for the Network Assets as SWER lines are not used.

4.13 Inspection of the Supply Network

Inspection of the supply network is governed by the Asset Maintenance Plans and this Plan. The inspection requirements dictated by these plans are implemented by the following processes:

- The maintenance activities in Asset Maintenance Plan in scope of this Plan are created in the Ellipse ERP as standard jobs (as listed in Appendix B).
- The required detailed inspections are loaded into Transgrid’s Asset Inspection Manager (AIM) system. This system creates inspection instructions for the field staff to follow and prompt input of inspection results through the users’ smartphone to be managed by the specialised AIM application.
- For activities under the direct control of Transgrid:
  - A MST (Maintenance Scheduled Task) is created in Ellipse that is an object that schedules the standard jobs at the intervals required by the Asset maintenance Plan as a Scheduled Work Order.
  - The planners assign competent field resources to the scheduled work orders using the Transgrid Resource Allocation Calendar (TRAC) application. This application allows the planner to schedule the execution date of the work order, allocate a competent resource (Transgrid or Contractor), and attach Authorisation System information that validates that the assigned resource has the required competency and capability.
- For activities where management of the required works has been outsourced Transgrid:
  - Arranges for the Contractor to perform the inspections. Upon receipt of the results of the inspection Transgrid advises the contractor of any corrective works that must be undertaken.
  - Transgrid included in its contract the competency requirements for workers including vegetation qualifications as defined in Transgrid’s ELCMP. Transgrid performs audits of its contractors to ensure they are complying with their contractual commitments.
- Where required, the operators create a switching plan to isolate sections of plant that require resource access.

- Once assigned Transgrid staff are advised via the TRAC application of the work they are scheduled on. This applies to Contractor resources, whom are informed by Transgrid of the resource type, skills and date required.
- Work is then performed by the assigned resources in accordance with the work instructions provided for the job.
- The list of equipment inspected at each network asset is found in the Summary of Maintenance Plan Activities in the Asset Bushfire Information.
- Inspection and maintenance of electric lines is conducted at a maximum interval of 37 months.

4.14 Processes and Procedures for Ensuring Training Courses Approved by Energy Safe Victoria

This section is only applied to transmission line assets. Currently transmission line assets include:

- BBTS-BBWF as the 220kV transmission line that connects BBW and BBTS.

Transgrid will be engaging with Victoria based easement Contractors familiar with and satisfying ESV compliance requirements. As part of Contractor management, Transgrid ensures the contracts satisfy Transgrid's expectations and requirements on competencies for carrying out maintenance any work on Transgrid network and easements. Transgrid requires Contractors to have achieved mandatory qualifications, experience and trainings. Additional information on the technical qualifications of competent staff and Contractors to ensure the Plan is implemented correctly, and the auditing to ensure they are competent is provided in this plan. Transgrid requires staff and contractors to have the following mandatory qualifications:

- Transmission Line Inspector Qualifications:
  - UET30512 – Certificate III in ESI Power systems transmission overhead. The training for this course is provided by Transgrid provides the training for this course.

    Core Competency Standard Units:

    > UETTDREL12A – Operate plant and equipment near live electrical conductors and apparatus.
    > UETTDREL16A – Working safely near live electrical apparatus.
    > UEENEEE101A – Apply Occupational Health and Safety regulations, codes and practices in the workplace.
    > UETTDRTP30A – Inspect transmission overhead structures and electrical apparatus.
- Easement Clearance Worker Qualifications:
  - Certificate II in ESI – Powerline Vegetation Control

    Core Competency Standard Units:

    > UEENEEE101A – Apply Occupational Health Safety regulations, codes and practices in the workplace
    > UETTDREL13A – Comply with sustainability, environmental and incidental response policies and procedures
    > UETTDREL14A – Working safely near live electrical apparatus as a non-electrical worker
    > AHCARB205A – Operate and maintain chainsaws
    > UETTDRVC23A – Plan the removal of vegetation up to vegetation exclusion zone near live electrical apparatus
    > UETTDRVC27A – Monitor safety compliance of vegetation control work in an ESI environment

    Along with those mandatory units association with the vegetation roles

  - Conducting complex tree and vegetation assessments Certificate IV and above in Arboriculture/Horticulture (horticulture, dependent on CSU studied) and 3 year of field experience in assessing trees.
- Additional Elective Competency Standard Units (prescribed by VESI) for specific vegetation management work

The above certificates required for the role follows VESI skills and training matrices (2019).

The Contractor will be authorised as per the Electricity Safety (General) Regulations 2019.

Transgrid's Authorisation System enables monitoring the holding and currency of these skills by resources (external or internal). More information is available in Section 4.15.

4.15 Processes and Procedures to Ensure Competence of Personnel Working Network Assets

4.15.1 Roles of Personnel Interfacing with or Working at the Substation

Table 6 provides a list of the key personnel responsible for ensuring the management of activities at the Network Assets and their key responsibilities.

Table 6 Roles of Personnel

Roles	Responsibilities
Supervisory Staff	
Asset Manager	Responsible for determining the overall maintenance strategy for Network Assets. They perform this with the assistance of Asset Strategists and Engineers reporting to them with specific competency in Network Asset systems. The key documents produced are: • Asset Renewal and Maintenance Strategy • Asset Maintenance Plan.
Maintenance Delivery Manager	• Responsible for conversion of activities required in the Asset Maintenance Plan into the Ellipse work management system and Asset Information Manager (AIM) system to allow scheduling and actioning in the field of the maintenance plan.
Asset Maintenance Manager	• Responsible for managing the field delivery of the activities required for the maintenance of the Network Assets in accordance with the maintenance plan. • Responsible for ensuring that defect work orders with a potential bushfire consequence are actioned and closed in accordance with this plan and open work orders are reported weekly in the period leading up to the fire danger period.
Technical Support Manager	• Provides contractual management for field activities performed under by Contractors • Develop the relevant emergency procedures: – Substation asset specific Emergency Response Plan – Transmission Lines Emergency Response – Procedure – After Fault Patrols – Work Instruction • Responsible for reviewing work reports from Contractor and authorising payment.
Manager Field Resources	• Provides Transgrid field resources required for the delivery of work to be performed at Network Assets.

Roles	Responsibilities
Manager / Health Safety and Environment	• Overall responsibility for delivery of systems and procedures for safety of workers (Transgrid and Contractors) working on Network Assets • Develop all health and safety related procedures for Transgrid staff and contractors with the assistance of appropriate technical resources (internal and contract).
Asset Systems and Compliance Manager	• Responsible for development and delivery of the electricity network safety management systems in compliance with AS5577 and regulatory authorities • Responsible for coordinating audit activities related to the safety management systems • Responsible for ensuring that actions that arise as a result of system audits are recorded in the CAMMS system are actioned. Key documents related to this are: • Electricity Network Safety Management System (NSW) • Electricity Safety Management Scheme (VIC) • Victorian Assets Bushfire Mitigation Plan • Electric Line Clearance Management Plan
Control Centre Manager	• Manages the processes, procedures and network operations staff that control operation of Network Assets from the Transgrid control room.
Asset Monitoring Centre Manager	Manages the: • Monitoring of asset performance including Network Assets • Managing incident investigations for network and asset related events that occur at the network asset.
Control Room Operators	• Perform operational oversight of Network Assets in accordance with the operating manual. • Coordinating switching required for safe operation of the site. • Initiating and supervising first response to events that occur at Network Assets. This includes ensuring that delivered resources are authorised for work as per the contract requirements. • Escalation of events that may require activation of the site emergency response plan.
Maintenance team leaders	• Supervise field related maintenance activities at Network Assets. This includes ensuring that Contractor resources are authorised for work as per the contract requirements.
Field / Site Staff	
Transgrid Maintenance Staff	• Provide maintenance resources for the site for the majority of planned maintenance activities.
First Response Contractor	• Provide first response services for unplanned events that occur at the site. • Provide assistance to Transgrid staff as required in the performance of planned maintenance activities.
Other contractors	• Other contractors may be required to perform works at Network Assets. Where required these contractors perform works under the direct supervision of Transgrid staff in accordance with all HSE procedures and Authority to Work requirements.

4.15.2 Training

Transgrid has an integrated on-line Authorisation System that performs the traditional approval to work function whilst ensuring access to areas is only granted to authorised and competent persons. This has the following functionality within it:

- Standardising/improving authorisation processes and alignment with the security cards/keys including a unified view of the status of authorisations and security access. This results in effective management of authorisations and security cards and improved safety and security.
- Integrates with external organisations (ESI companies, direct customers and contractor organisations) by implementing a secured portal to capture authorisation, training recognition and security card/keys applications online.
- Has integration with the Transgrid ERP system (Ellipse) to ensure competencies managed through Authorisation System are up to date.

Where Transgrid staff are required to attend site, competence is managed through Transgrid's internal training and competency frameworks including requirements for relevant Victorian legislation and regulation.

A specific contract for outsourced services is prepared for contractors. This contract calls for:

- Provision of first response and Site Emergency Management
- Provision of switching and isolation services.
- Provision of safe site access for non-authorised person for observation purposes only.
- Provision of suitably trained and experienced staff to contribute to the delivery of Maintenance Services.

Contractors are required to become authorised under the relevant categories of Transgrid's PSSR and Environmental Authorisations prior to working at Transgrid's sites. To become authorised, workers will be required to undertake training as prescribed in Table 7.

The Contractor will be authorised as per the Electricity Safety (General) Regulations 2019.

The monitoring of authorisation of staff and compliance to Electricity Safety (General) Regulations 2019 is managed in Transgrid's online Authorisation System. The system will contain the following information to ensure staff is qualified, experienced and trained and holds a valid and current qualifications to implement this Plan. These include:

- Transgrid Vegetation Skills and Training Matrix modelled on VESI matrix (to ensure competency personnel undertaking tasks related to electric line clearance).
- Skills required to perform vegetation management safety at Transgrid.
- Staff details and their qualifications. It is the responsibility of the Contractor to maintain the currency of staff details and their qualifications. Transgrid will audit the Contractor's staff qualification records. These records will be made available to Transgrid upon request.
- Processes relevant to the management of training records (initial and refresher)
- Induction and authorisation processes for all new ELC personnel
- Authorisation details of staff, including Contractor staff, is maintained in our Authorisation System.
- It is the responsibility of the Contractor to monitor the expiry date of their skills, which will trigger notifications to ensure the skills are updated before working for Transgrid.
- Identification of skills training provided via a Registered Training Organisation or internally by Transgrid.
- ELCMP induction.

Authorised contractors are supplied with an access card to ensure that only authorised personnel have access to the site. Contractors receive the access card after they complete the required PSSR and Environmental authorisations led by Transgrid.

All such worker's that are authorised under the Transgrid's PSSR and Environmental Authorisations will be required to undertake 'Refresher Training' at regular intervals to maintain their authorisation. This training normally comprises of an assessment and/or learning. It is typically two-yearly or annually and the method of delivery is through eLearning and/or face to face training. Transgrid will notify the contractor prior to 'Refresher Training' to identify training needs and provide a training estimate.

Table 7 PSSR and Environmental Authorisations – Qualifications and Training Requirements

PSSR or Environmental Category	Examples of work requiring this category
Category 5.5 – Operate HV Air Insulated Switchgear	Switching and isolation services for planned, Unplanned and Emergency work.
Category 5.4 – Issue HV Access Authority	Issuing an Access Authority for planned, unplanned or Emergency work.
Category 5.2 & 5.3 – Receipt of a HV Access Authority and HV Testing	Receive an Access Authority for work on or near HV conductors and Act as the Authorised Person in Charge for works under an Access Authority. Supervise instructed persons for work in the switchyard.
Category 5.1 – Working under a HV access authority	Working under a HV access authority
Category 4.1, 4.2 & 4.3 – Work Under a Low Voltage/Mechanical Access Authority, Issue a Low Voltage/Mechanical Access Authority & Operate Low Voltage/Mechanical Apparatus including Produce/Check LVMPRI.	Operate Low Voltage and Mechanical Apparatus, Produce and Check LVMPRI's, Receive Low Voltage Access Authorities.
Cat 3.3 – Work in Substation General	Any Work within the Substation.
E1, E2 & E3 – Environmental Authorisation	E1 – Access and inspection (observation only) E2 – Carry out work E3 – Supervise Work
Category 6.5 – Operate HV AIS for work on or near overhead lines	Switching and isolation services for planned, Unplanned and Emergency work.
Category 6.4 – Issue a Field Access Authority	Issuing a Field Access Authority for planned, unplanned or Emergency work.
Category 6.3 – Receipt of a Field Access Authority	Receive a Field Access Authority for work on or near overhead lines and Act as the Authorised Person in Charge for works under a Field Access Authority
Category 6.2 – Working under a Field Access Authority	Working under a field access authority
Category 6.1 – Overhead lines and equipment – general	Overhead line work not requiring a field access authority

Training for Categories 3.3, 4.1, 5.1, 5.2, 5.3, 6.1, 6.2 and 6.3 in Table 7 will be as per the standard Transgrid training for contractors. Training for Categories 4.2, 4.3, 5.4, 5.5, 6.4 and 6.5 is a gap training which is intended to cover differences between the PSSR and the safe access to High Voltage management system, which contractors currently works by. All workers the contractors utilise for first response services must be qualified to at least an equivalent level within the Transgrid's Contractors safe

access to High Voltage management system. Contractors supply information on their most familiar 'safe access to High Voltage management system' alignment between their authorisation levels and those specified in the table above and the relevant qualifications of workers it intends to use for first response services.

Transgrid ensure persons who carry out work are competent by having individuals nominated in the contract with the contractors, which lists the proposed on call staff and duty officers and their experience. Transgrid check the accreditations and specifically verify that these persons have completed the Transgrid PSSR training by interrogating the on-line Authorisation System before providing access to the site for performance of the works under the contract. As all industry workers in Victoria must now comply with the requirements of the Code of Practice on Electrical Safety for Work On or Near High Voltage Electrical Apparatus (the Blue Book 2017), it was a specific requirement of the contract that the company provided references for their experience under the Code of Practice by traceable references which Transgrid use to validate their experience.

Mandatory safety training and annual refresher training is required to maintain Authorisation to Work. A list of the various training requirements for each Authorisation category including contact details for booking training courses are provided in the contract Attachment 8 – PSSR and Environmental Authorisation. PSSR authorisation and access to Transgrid sites shall be terminated should staff competency not be maintained.

The PSSR elements are audited via the on-line Authorisation System and all aspects of the works under the contract are subject to an annual internal audit. Non-conformances reports (NCRs) of the work are to be reported by the contractor and PSSR authorisation and access to Transgrid sites shall be terminated should staff competency not be maintained.

It was a specific requirement of the contract that all work be carried out according to the following legislative and specific Transgrid Requirements:

> *"All work shall be carried out in strict accordance with the Occupational Health and Safety Act 2004 and Regulation 2007 as well as Transgrid specific Health and Safety requirements.*
>
> *Transgrid expects all contractors to be committed to ensuring a safe workplace is a priority and have safe systems of work to prevent illness and injuries at work and be able to demonstrate this for the duration of the project life cycle from tender phase to site completion.*
>
> *Audits, inspections and general workplace monitoring will be carried out in accordance with the Occupational Health and Safety Act 2004 and Regulation 2007."*

Pre-Work Risk Assessments are required to be carried out prior to commencing any work under the contract. Records of Pre Work Risk Assessments shall be kept for a period of two years and may be audited by Transgrid at any time. When requested, these Pre-Work Risk Assessments must be provided to Transgrid prior to commencing the work. This and other requirements such as random auditing requirements are contained in the contract for first response services with the contactor.

The PSSR and Environmental Rules require specific Qualifications and Training requirements depending on which section of the works fall under the appropriate section of the PSSR. These requirements apply to Transgrid staff and contractor are contained in the contract.

Figure 4 Example of Qualification and Training requirements in contracts

PSSR and Environmental Rules – Qualifications and Training Requirements PSSR Categories (Training Provided by Transgrid Only)	Co-requisites (Training provided by Transgrid Only)	Core Qualifications (Prerequisites)	Additional Mandatory Competency Units (Prerequisites)					
			General Construction Induction Card	HLTAID001 – Provide CPR	UETTDRRF06B – Perform rescue from live LV pan	UETTDRRF02B – Perform Pole top rescue	UETTDRRF04B – Perform tower rescue	Provider
1.0 – Safe Access to substations		Nil	☑					Any RTO with unit on scope
3.1 – Work within a substation buildings and carparks	1.0	Nil	☑					Any RTO with unit on scope
3.2 – Work in switchyard no affecting substation apparatus	3.1	Nil	☑					Any RTO with unit on scope
3.3 – work in switchyard affecting switchyard apparatus	3.2	Nil	☑					Any RTO with unit on scope
4.0 – LV/Mech General	3.3	Nil	☑	☑	☑			Any RTO with unit on scope
4.1 – Working under a LV/Mech access authority	3.3	Electrical trade	☑	☑	☑			Any RTO with unit on scope
5.1 – Working under a HV access authority	3.3	Nil	☑	☑	☑			Any RTO with unit on scope
5.2 – Receipt of a HV access authority	5.1	Electrical trade	☑	☑	☑			Any RTO with unit on scope

4.15.3 Competency

The competency of staff performing work is continually monitored by their Supervisors as follows:

- For Transgrid staff, the Works Leader responsible for delivering the work monitors the performance of Transgrid staff on each activity. In addition, Transgrid's Human Resources Information System is used to maintain performance and development records for each staff member.
- For Contractors, the competency of staff performing work is monitored both by the contract staff supervisor as well as the Transgrid person responsible for the contracted works. Monitoring is carried out for each activity via feedback from the Transgrid staff initiating or interacting with the Contractors (e.g. Transgrid System Operator during a first response call-out or Transgrid Works Leader during a maintenance task) and through a review of the activity completion records. Quality Requirements including audits, and non-conformance/corrective actions are covered in the contract.

4.15.4 Inspector Competency

Transgrid will be engaging with Victoria based easement and transmission line contractors familiar with and satisfy ESV compliance requirements as stated in this plan. Transgrid ensures that all inspectors have the following qualifications through specifying the requirement in its contracts. Transgrid requires contractors to have the following mandatory qualifications as specified in Section 4.14.

Transgrid provides training by going to market to procure the services of an RTO that provides the training for the required competencies.

The contractor sends the latest training matrix to provide assurance to Transgrid that their inspectors for lines and easements have the valid and relevant competencies. The training matrices helps Transgrid verify the validity of inspector competencies and compliance with Transgrid's requirements. Transgrid requires the contractors' quality system to be certified to ISO9001 in order to provide a degree of assurance that the records for managing the competencies of inspectors remains current.

As a part of the contract Transgrid provides formal induction session to the contractor site staff prior to commencement of maintenance work. This is to ensure that contractor's inspectors are familiar with site specific issues such as site access, property owner requirement, biosecurity requirement, seasonal cropping and etc.

Transgrid's contractors perform technical audits on their staff to ensure the work performed is completed as per their business processes. This is captured in the contract with the contractor. Transgrid performs technical audits on contractors' maintenance performance in accordance with the Control Assurance Review (CAR) document and through random reviews by Works Delivery supervisory staff. The purpose of the audits and/or CAR assessments are:

- Identify any issues with the effectiveness of, or ability to implement, the controls required by the asset management plans.
- Ensure that the maintenance and inspection activities, as set out within the Maintenance Plans, are scheduled correctly within the maintenance planning systems.
- Ensure that all activities being undertaken are in accordance with the relevant asset management policies, service instructions, standards, processes and contractual requirements.
- Ensure that asset defects are recorded in the information system as per procedure.
- Ensure the rectification of defects is effective and occurring in accordance with priorities.
- Ensure the recommendations included in incident investigation reports are being implemented effectively.
- Ensure that inspectors whom complete asset maintenance for Transgrid have valid competencies.

These CAR assessments provides a means of ensuring that the contractors' performance lowers Transgrid's bushfire risk to AFAP. The CAR assessment is managed by the Asset Manager group, and executed by the Asset Manager group and the relevant Maintenance Manager group. The staff that complete the CAR assessment are qualified and capable in the role they perform in Transgrid's Asset Management System. This is managed by the Asset Management System Capability Guideline.

4.16 Operating plans in event of fire and on Total Fire Ban Days

4.16.1 Declaration of Fire Danger Period

Victorian CFA declares the Fire Danger Period (FDP) in accordance with Section 4 of the Country Fire Authority Act 1958 for particular municipalities. These dates may vary due to changes in local conditions; information of the FDP is obtained by Transgrid from the following location:

http://www.cfa.vic.gov.au/warnings-restrictions/restrictions-during-the-fire-danger-period/

Subject to an earlier declaration, Transgrid has identified the 1st of September as the start of the FDP to provide a clear target to complete bushfire risk management work to as far as practicable before the 1st October. Transgrid has identified the 31st of March as the end of the fire danger period to trigger internal reporting on Transgrid's performance on bushfire risk management.

4.16.2 Operating Plans during FDP and Total Fire Ban days

There are no specific changes to operations or operating protocols applied to the Network Assets for operations on a total fire ban or code red day. The Network Assets will be managed in a consistent manner with all other Transgrid assets, such as the requirement to advise AEMO of any present or anticipated risk

to Power System Security. The following operating manuals assist Transgrid's operators in addressing bushfire risk to the network:

- OM 680 – Planned Outages: requirements for arranging planned outages.
- OM 681 – Contingency Planning: details the circumstances in which different types of contingency plans are required and specifies the format in which written plans should be submitted.
- OM 695 – Management of External Hazards: This procedure details how the risk associated with external hazards (bushfires) to transmission lines is to be managed and, when appropriate, communicated to AEMO.

The Transgrid control room operators and the Asset Monitoring Centre are aware of total fire ban days and will monitor the Network Assets for any issues but as per Section 4.16.4 provide oversight that Hot Work is not being performed on these days.

4.16.3 Fire event during FDP

In the event of a fire on the network asset, the below procedures will be actioned as appropriate based on the level of emergency. Emergency levels and requirements for engagement of stakeholders is detailed in each procedure:

- The Corporate Emergency Management Plan (CREMP) that involves senior leadership oversight of emergencies that represent significant business risk.
- The Power System Emergency Response Plan (PSERP) that is a specific protocol to respond to and manage power system emergencies.
- The relevant substation specific emergency response manual. The asset specific manual is listed in the Asset Bushfire Information.
- The Asset Event Investigation and Reporting is executed when investigating asset failure that initiated a fire ignition, even if no fire eventuated for the asset failure.

The operating protocols with connected parties at the Network Assets provide guidelines on how connected parities are to respond incidents. A list of operating protocols at each asset is provided in the Asset Bushfire Information.

4.16.4 Exemptions and Permits on Total Fire Ban days

Transgrid does not perform any maintenance work that presents a fire risk on Total Fire Ban or Code Red days. However, Transgrid has received exemptions to perform certain work on Total Fire Ban days, in accordance with the permit issued by CFA (recorded in the Hot Work and Fire Risk Work Procedure).

The Hot Work and Fire Risk Work Procedure details the requirements for performance of work on Total Fire Ban Days. This procedure states:

'It is prohibited to carry out any Hot Work 'in the open' that causes, or is likely to cause a fire during a Total Fire Ban (TOBAN) unless authorised under an exemption issued by the RFS or CFA (Victoria).'

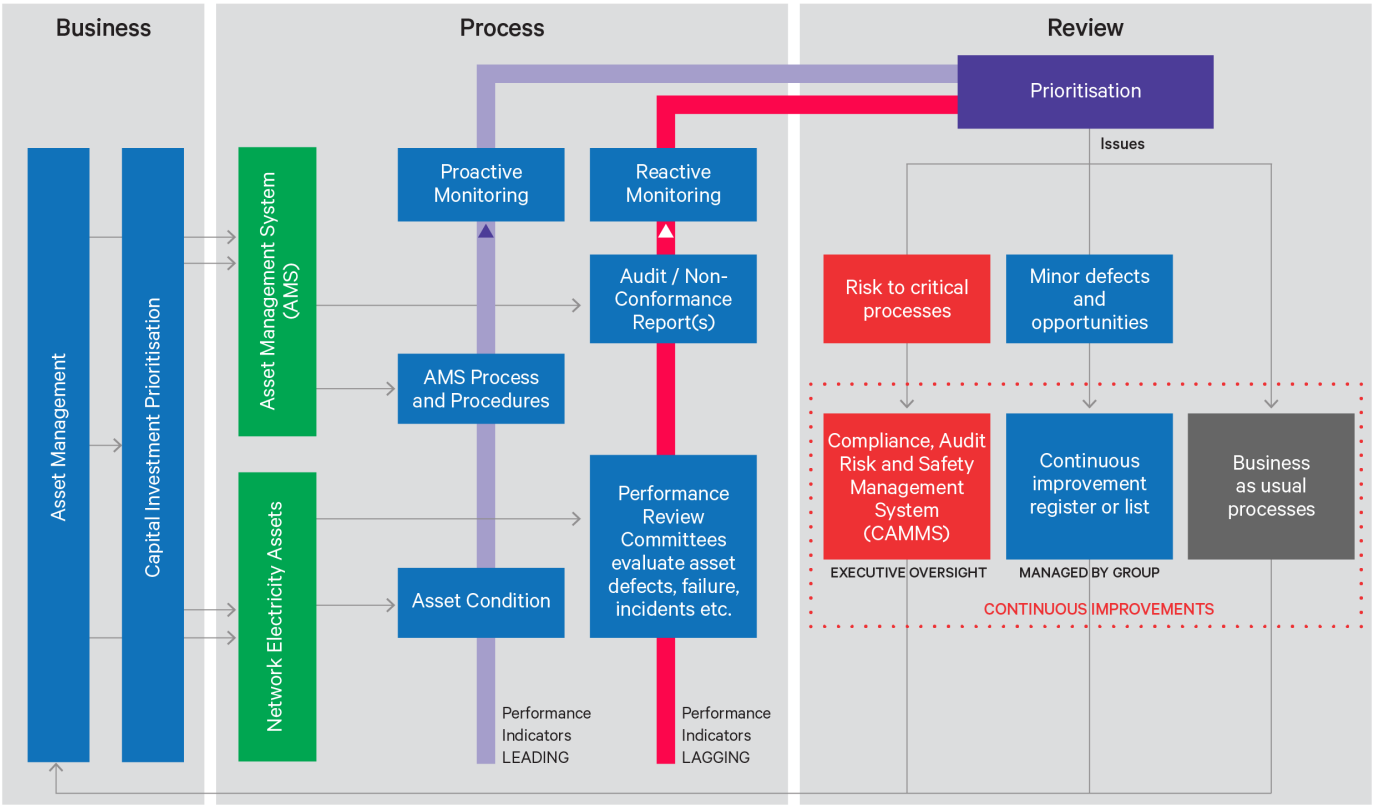
4.17 Investigations, Analysis, and Methodology for Mitigation of Risk of Ignition

4.17.1 Overview

Transgrid strives to continually improve its safety and asset management systems through a series of processes and forums that are illustrated in Figure 5. The key components of this framework relevant to this plan are:

The key concept in this framework is to continually improve Transgrid's safety and asset management systems through a closed loop approach utilising a combination of proactive and reactive monitoring and auditing.

Figure 5 Transgrid Monitor and Review Processes



4.17.2 Incident Identification and Reporting

The management or identification of asset related incidents and events, including asset failures and fire starts, is through the following processes:

- 24 hour monitoring:
  - Operators identify failures and events either through the SCADA monitoring systems, or from an external incoming call and record through the Operations Logging System (OpsLog) this generates an Irregularity that feeds into the Non-Routine Maintenance Process.
- Corrective Maintenance Process:
  - Operations and Field maintenance staff identify and record asset defects and failures by entering an issue (defect) into the Asset Inspection Manager (AIM) application. For serious events the control room operator is contacted to commence emergency management procedures.
- Events that have a people safety or environment consequence are recorded as “Incidents” in CAMMS for safety to investigate.

Transgrid has instigated an incident management processes that is used to control people, activities and information following the occurrence of an event that has led to or could have led to injury to people, damage to plant, machinery or the environment and/or some other loss including bushfire. The process for incident investigation is managed through the following processes at Transgrid:

- For Health, Safety and Environment events not caused by a network asset, incidents are investigated through the HSE Hazard and Incident Management. This is supported by a number of sub procedures including:
  - Incident investigation guidelines, High and Low Consequence
  - Incident investigation online training.

- For network asset initiated or network related incidents, these are investigated in accordance with the Asset Event and Investigation Reporting Procedure.

Transgrid uses an incident notification system for the recording and reporting of health, safety and environment incidents. To prevent a recurrence, all reported incidents are responded to and investigated to determine the causes and the corrective actions required. Serious incidents are reported to ESV and /or Safe Work Victoria as required by those authorities.

The Asset Event and Investigation Reporting Procedure requires that investigations into network incidents are reviewed to identify if they were a result of deficiencies in controls related to the Key Hazardous Events, this includes the controls related to the mitigation of bushfire related events. A listing of the investigation requirements is provided in Appendix D.

Incidents involving network outages that do not result in HSE related events are reviewed at the Network Performance Review meeting and classification is confirmed as 'Statistical', 'Minor', or 'Major' in accordance with AER/NER reporting definitions. The level of reporting investigation and reporting required is identified in the Asset Event and Investigation Reporting Procedure and the relevant section of this procedure containing the reporting matrix is included in Appendix D.

4.17.3 Implementing Corrective and Preventative Action (Mitigation)

Any critical corrective actions that are raised as part of the investigation processes are monitored in CAMMS, for improvement actions that are not related to mitigating critical events these are handled either through entry to the continuous improvement register or other business as usual processes. Corrective action records are maintained in accordance with legislative requirements and Transgrid practices.

4.18 Implementation, Auditing, Deficiencies and Rectification of the Plan

Not available in this public version, for further details refer to Transgrid. Full details are included in the full Bushfire Mitigation Plan.

4.19 Policy in Relation to Assistance to Provide Fire Control Authorities in Investigation of Fires Near the Network Assets

Transgrid will provide assistance and advice to Country Fire Authority personnel to ensure that safe approach distances are maintained in accordance with the relevant 'Limits of Approach' contained within the Blue Book for the purposes of their response to fire incidents near Network Assets.

Assistance includes ensuring all un-safe electrical assets are made safe before the commencement of investigations and the provision of any reports relating to serious electrical incidents that Transgrid are Figure 8 Operational Boundary Points between Transgrid, Ausnet Services (220kV lines) and Powercor (66 kV)required to provide in accordance with the Electricity Safety (Management) Regulations 2009.

4.20 Owners of Private Electric Lines

This regulation is not applicable as Transgrid's Network Assets do not connect to private electric lines.

4.21 Measures to be Used to Assess the Performance of the Major Electricity Company Under the Plan

Not available in this public version, for further details refer to Transgrid. Full details are included in the full Bushfire Mitigation Plan.

Appendix A Bushfire Preventative and Mitigative Controls

Not available in this public version, for further details refer to Transgrid. Full details are included in the full Bushfire Mitigation Plan.

Appendix B Standard Jobs in the scope of this Plan

Not available in this public version, for further details refer to Transgrid. Full details are included in the full Bushfire Mitigation Plan.

Appendix C Assessment of work orders in scope of this plan

Not available in this public version, for further details refer to Transgrid. Full details are included in the full Bushfire Mitigation Plan.

Appendix D Network Incident Reporting Matrix

Not available in this public version, for further details refer to Transgrid. Full details are included in the full Bushfire Mitigation Plan.

Appendix E DPTS Bushfire Information

E.1 Background

This includes the 220kV/66kV DPTS on the western suburban fringe of Melbourne Victoria. Transgrid has a 30 year contract to own and operate DPTS.

The site has the following neighbours that are considered in development of this plan:

- Open paddock surrounds Deer Park on the Northern, Western, and Southern Sides that are a bushfire hazard;
- The nearest neighbour is Boral Deer Park Operations to the South and West of the site; and
- The Dame Phyllis Frost Correction Centre is situated 500m to the southwest of the substation site. The Site Controller and Emergency Services should be aware that this facility is difficult to evacuate. As such, if there is a risk of an emergency impacting the Correction Centre, liaison should be made with the Correction Centre at the earliest opportunity.

The 24hr phone number for the Correction Centre is 03 9217 8400.

E.2 Description of the Land

This plan applies to Transgrid's electricity transmission network elements that are located at 279-329 Christies Rd, Ravenhall VIC 3023 (see E.3 and Appendix E.4 consisting of a substation and associated sub-assets). In broad terms the assets that are within the scope of this plan are:

- Substation equipment;
- Property under the control of Transgrid; and
- Secondary systems, excluding metering systems.

For the operation of DPTS, Transgrid interfaces with other major electricity companies (MEC). Interconnection points of the DPTS to AusNet Services and Powercor are defined in Appendix E.4.

Figure 6 Deer Park 220kV and 66kV switchyard

As shown in Figure 2, the DPTS is located on land identified as bushfire prone. The Country Fire Authority has confirmed that this site is classified as a High Bushfire Risk Area (HBRA) as evidenced in Appendix A.

Figure 7 Victorian Government identification of areas which are bushfire prone around DPTS as at 11 December 2017

E.3 Critical Assets

Not available in this public version, for further details refer to Transgrid. Full details are included in the full Bushfire Mitigation Plan.

E.4 Summary of Maintenance Plan Activities

Not available in this public version, for further details refer to Transgrid. Full details are included in the full Bushfire Mitigation Plan.

E.5 Asset and Operational Responsibilities

Transgrid operates and maintains the Deer Park Terminal Station (DPTS) located at 329/279-329 Christies Rd, Ravenhall VIC 3023 on a long term lease basis. The interfaces with other major electricity companies (MEC) at DPTS are described as following:

Interconnection between the AusNet Services and Transgrid Systems where the operational boundaries are as defined below:

- Geelong – Deer Park 2 220kV Transmission Line where the 220kV droppers connect to the landing span at Transgrid's Deer Park 220kV Substation, and
- Keilor – Deer Park 2 220kV Transmission Line where the 220kV droppers connect to the landing span at Transgrid's Deer Park 220kV Substation.

In addition at the DPTS there is an interface with Powercor, whereby Powercor has operational responsibility of all equipment located within the Powercor operating boundary. This includes the following Transgrid owned equipment:

- MLN No2[3] feeder bay equipment;
- TNA No1 feeder bay equipment;
- MLN No1[4] feeder bay equipment;
- SU No2 feeder bay equipment;
- TNA No2 feeder bay equipment, and
- SU No.1 feeder bay equipment.

The specific operational interface points at DPTS are shown in Figure 8. DPTS was energised in September 2017. Overall Emergency Management is carried out by the Asset Monitoring Centre (AMC). Specific operating requirements are found in the Grid Operating Manual – OM 006, Substation Operating Notes in Southern Region.

General Information Related to the Operation and Maintenance of the Site

Network operators in Victoria must operate in accordance with the principles of the Code of Practice on Electrical Safety for Work on or Near High Voltage Electrical Apparatus (the Blue Book). It however is not a direct equivalent of the Transgrid Power System Safety Rules (PSSR) and each network operator has additional rules and controls they implement downstream of the Blue Book.

AusNet Services are the owner and operator of the transmission network in Victoria. They have a document titled the 'Health, Safety and Environment Rules for Field Employees and Contractors – Electricity' which defines some of the entry and work requirements for working at AusNet sites.

Powercor is a distribution network owner and transmission network maintainer based in Victoria. It maintains the transmission Network Assets on behalf of AusNet Services in the North and West of Victoria.

Powercor do not have a set of 'Safety Rules' for working in transmission substations as they are ostensibly a Distribution MEC. Powercor work under the AusNet rules in those installations. At distribution levels (voltages up to 66kV) they work under the Victorian Electricity Safety Industry (VESI) Green Book.

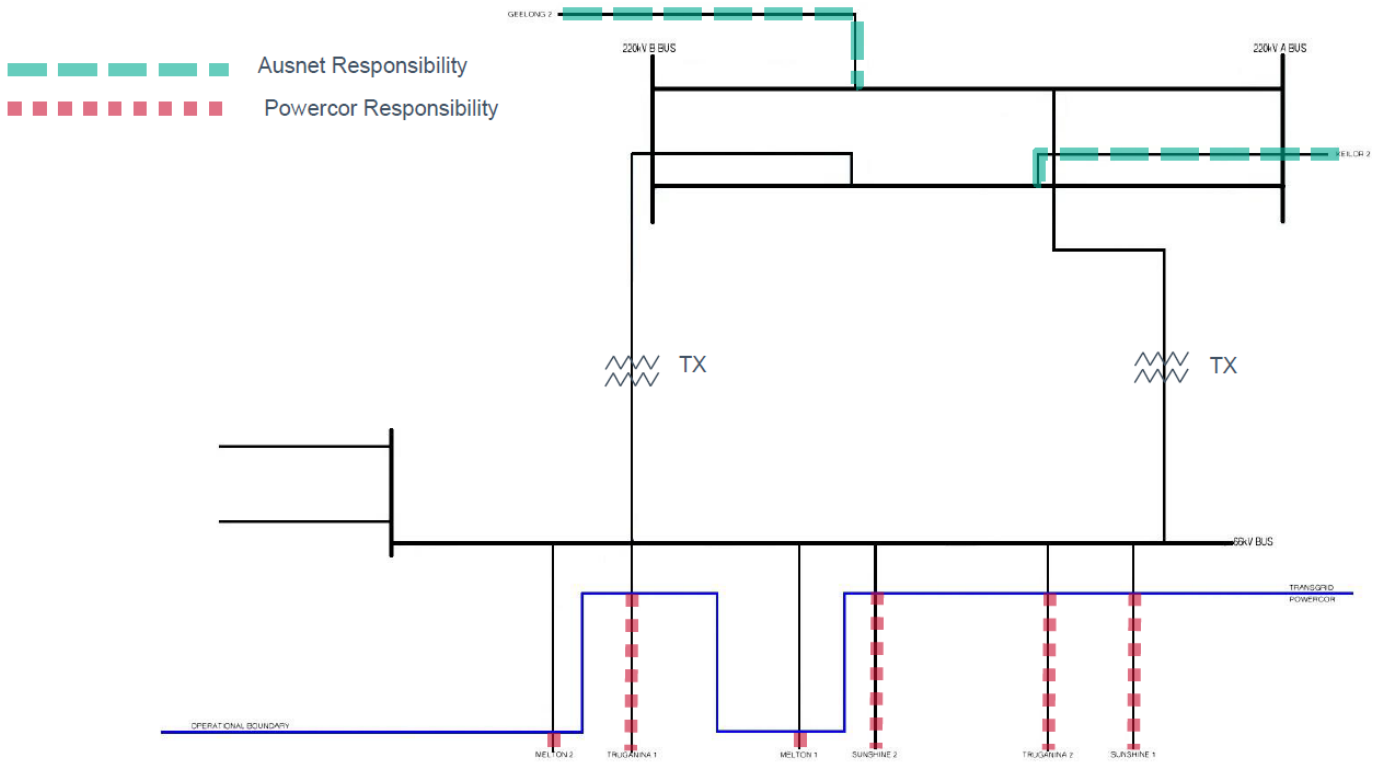
The operation of the DPTS site is under the control of the Transgrid control room and is managed under the following Operating Rule Arrangements:

- For assets under their operational control (66kV Circuit Breakers and Switchgear), Powercor operate the equipment under their safety rules (the Green Book and its associated procedures); and
- Assets under Transgrid operational control are to be operated under the Transgrid PSSR, with any additional requirements required by the Blue Book implemented for work at DPTS. This requires that Contractor be familiar with operating under both sets of rules.

[3] Operational Control of the circuit breaker resides with Transgrid on an interim basis until the feeder is commissioned in December 2017

[4] Operational Control of the circuit breaker resides with Transgrid on an interim basis until the feeder is commissioned in December 2017

Figure 8 Operational Boundary Points between Transgrid, Ausnet Services (220kV lines) and Powercor (66 kV)



E.6 Bushfire Risk

Not available in this public version, for further details refer to Transgrid. Full details are included in the full Bushfire Mitigation Plan.

E.7 DPTS Emergency Contact Numbers

Contact	Contact Number	Reason for contact
3M Oil Solvents	1800 802 902	Additional spill material
Council – City of Melton	(03) 9747 7200	
Dame Phyllis Frost Correction Centre	(03) 9217 8400	Contact in the event that an emergency may impact the Correction Centre
Police	000 (03 9361 4700)	As required (Caroline Springs Police Station)
Country Fire Authority	03 8746 1400	Fire (District 14 HQ Melton)

E.8 Bushfire Management Artefacts

Not available in this public version, for further details refer to Transgrid. Full details are included in the full Bushfire Mitigation Plan.

Appendix F KMTS Bushfire Information

F.1 Background

The 220kV/33kV KMTS is located in remote Victoria, at Kiamal where the closest town is Ouyen and closest city is Mildura. Transgrid has a 30 year contract to own and operate KMTS.

KMTS is located adjacent to Kiamal Solar Farm that is owned and operated by Total Eren. Kiamal Solar Farm is expected to generate 350MW on an 800 hectare site. The solar farm is to be built in two stages.

The neighbours, in order of increasing distance from the KMTS are as follows:

- Calder Highway, a public road which is located 1.8km to the east of KMTS.
- The town Ouyen, which is approximately 5.3km south of KMTS.

F.2 Description of the Land

This plan applies to Transgrid's electricity transmission network elements that are located

KMTS is located on a single land parcel of total size 6 hectares, of which 0.53 hectares dedicated to the terminal station. The 6 hectares is a subdivision of the land bought by Total Eren of 319.1 hectares. Total Eren will be using the land to build the solar farm. This land is strategically selected to cut-into existing 220 kV transmission lines owned by AusNet Services. The subject site was formerly used for grazing stock. A 5.5m wide access road from Old Kia Road to KMTS is available.

In broad terms the assets that are within the scope of this plan are:

- Substation equipment.
- Property under the control of Transgrid.
- Secondary systems, including metering systems.

For the operation of KMTS, Transgrid interfaces with other major electricity company (MEC). Interconnection points of the KMTS to AusNet Services and the generator Total Eren. Appendix F.5 contains more information on the operational interface between these connected parties.

KMTS is on High Bushfire Prone land based on the spatial data provided by Country Fire Authority to Transgrid's Spatial Information and Survey business group.

F.3 Critical Assets

Not available in this public version, for further details refer to Transgrid. Full details are included in the full Bushfire Mitigation Plan.

F.4 Summary of Maintenance Plan Activities

Not available in this public version, for further details refer to Transgrid. Full details are included in the full Bushfire Mitigation Plan.

F.5 Asset and Operational Responsibilities

Operational Boundaries

The operational boundaries at KMTS is provided in Table 8:

Table 8 KMTS Connected parties

Owner of Interfacing Network	Interfacing equipment
AusNet Services	• Murra Warra – Kiamal 220 kV Transmission Line where the 220 kV droppers connect to the landing span at Transgrid's Kiamal 220 kV Substation. • Red Cliffs – Kiamal 220 kV Transmission Line where the 220 kV droppers connect to the landing span at Transgrid's Kiamal 220 kV Substation.
Total Eren	• 33kV underground cable terminations for Collector Group 1 to 12 from Kiamal Solar Farm • 190MVA Synchronous Condenser

The specific operational interface points at KMTS are shown in Figure 9. KMTS planned energisation date was December 2019. Site operation date is planned in July 2020.

Overall emergency management will be carried out by the Asset Monitoring Centre (AMC). Specific operating requirements will be found in operating manual OM 006, Substation Operating Notes in Southern Region.

General Information Related to the Operation and Maintenance of the Site

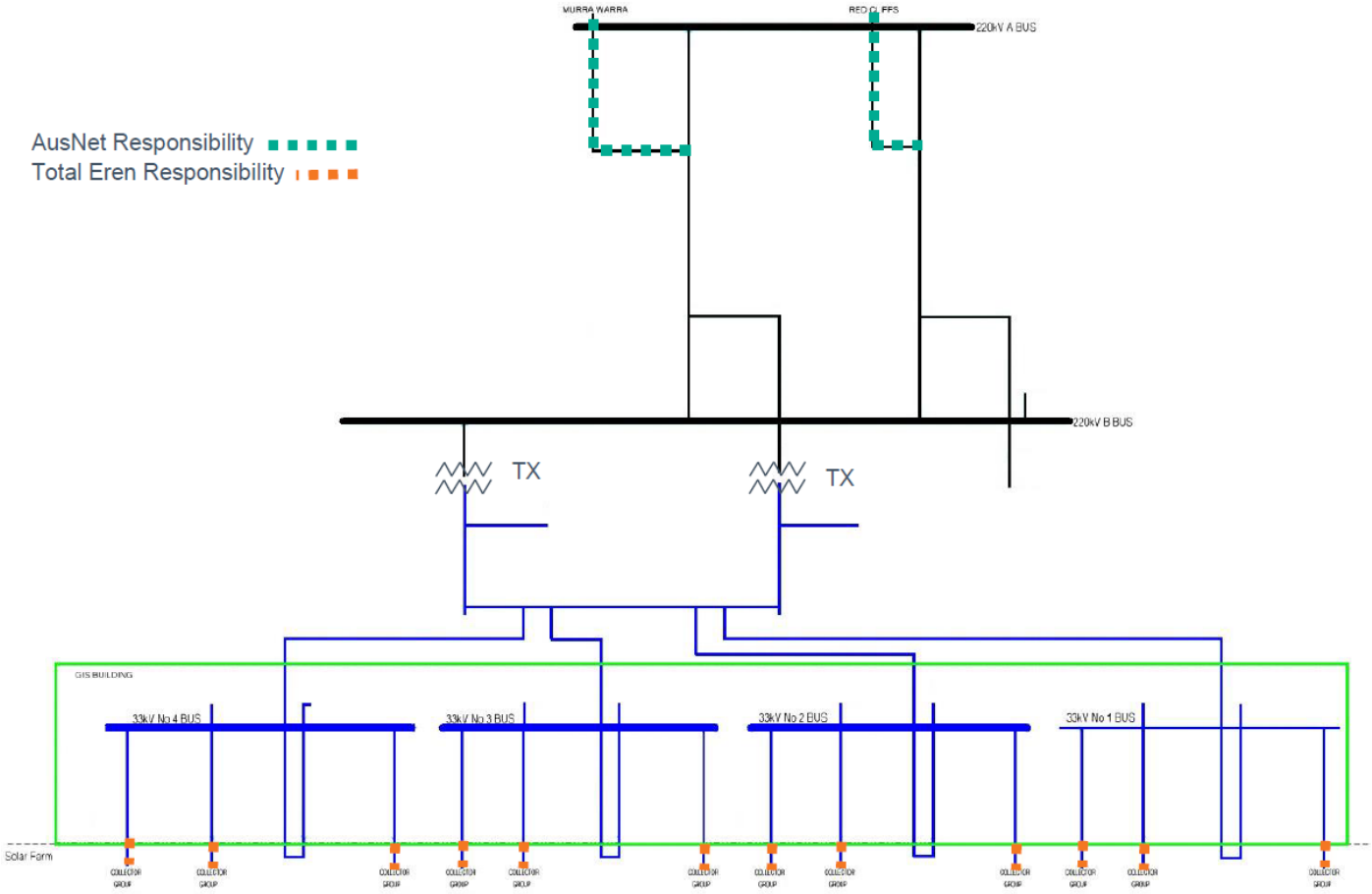
Transgrid, Total Eren and AusNet Services are to operate in accordance with the principles of the Code of Practice on Electrical Safety for Work on or Near High Voltage Electrical Apparatus (the Blue Book).

Transgrid has documented the operating arrangements, which considers network safety, in the operating protocols with Total Eren and AusNet Services.

The operation of KMTS is under the control of the Transgrid control room and is operated as per the operating protocols in place.

Assets under Transgrid operational control are to be operated under the Transgrid PSSR, with any additional requirements required by the Blue Book implemented for work at KMTS. This requires the Contractor to be familiar with operating under both sets of rules.

Figure 9 KMTS: Operational Boundary Points between Transgrid, AusNet Services (220 kV lines) and Total Eren (33 kV) Load Types



F.6 KMTS Emergency Contact Numbers

Contact	Contact Number	Reason for contact
3M Oil Solvents	1800 802 902	Additional spill material
Mildura Rural City Council	(03) 5018 8100	Emergencies that affect public safety
Total Eren Kiamal Solar Farm	David Miller: 0411-079-873 Ben Killius: 0447-738-679	Contact in the event that an emergency may impact the Kiamal Solar Farm
Police	000 (03) 5092 2502	As required (Ouyen Police Station)
Country Fire Authority	(03) 5036 2800	Fire (District 18 HQ Ouyen)

F.7 Bushfire Management Artefacts

Not available in this public version, for further details refer to Transgrid. Full details are included in the full Bushfire Mitigation Plan.

Appendix G BBTS-BBWF, BBTS and BBW Bushfire Information

G.1 Background

Berrybank Terminal Station (BBTS)

The Berrybank Terminal Station is connected to the existing 220kV transmission network, specifically at the transmission line that runs between Terang and Ballarat Terminal Stations. BBTS is located at Mount Bute, approximately 1.5km off Lismore-Scarsdale Road or approximately 1.4km off Willowvale Rd.

BBTS-BBW 220kV line (BBTS-BBWF)

The 220kV transmission line connects the Berrybank Substation to the Berrybank Terminal Station to enable electricity to flow from the Berrybank Wind Farm to the Victorian transmission network.

The line is approximately 7.5km long on a 50m easement. The structures used are of single circuit single steel pole, similar to Transgrid's standard pole types. The line crosses over Willowvale Road and Lismore Road, Wallindue Road and Padgetts Lane. The line runs in parallel to Padgetts Lane, in the road corridor, which is taken into careful consideration to eliminate, if not possible to reduce to AFAP, the bushfire risk during the design of the line.

Berrybank Substation (BBW)

The transmission line terminates at a gantry which then connects to two power transformers. The Berrybank Substation is strategically located to connect to the Berrybank Wind Farm via 33kV underground cables.

The neighbours, in order of increasing distance from the BBW are as follows:

- BBW is located off Padgetts Lane.
- The town, Lismore, which is approximately 20km southwest of BBW.

G.2 Description of the Land

The proposed location for the BBTS and BBW are within a greenfield area. The Network Assets are located approximately 50km south west of Ballarat, and 10km north of Berrybank, Victoria. The proposed new transmission line (approximately 7.5km in length) runs south east from the BBTS to the BBW, following the alignment of Padgetts Lane. Land use along the alignment is predominantly private property, used primarily for agriculture, with cropping, sheep and cattle grazing observed.

The topography of the site is generally flat with gently undulating country side.

A 5m wide access track is provided to BBTS from Willowvale Road, Mount Bute.

In broad terms the assets that are within the scope of this plan are:

- Substation equipment.
- Property under the control of Transgrid.
- Secondary systems, including metering systems.
- Transmission line and associated fittings and fixtures.
- Easement.

For the operation of BBTS, Transgrid interfaces with another major electricity company (MEC) AusNet Services. For the operation of BBW, Transgrid interfaces with the windfarm generator Union Fenosa Appendix G.5 contains more information on the operational interface between these connected parties.

BBTS, BBW and BBTS-BBWF is on High Bushfire Prone land based on the spatial data provided by Country Fire Authority to Transgrid's Spatial Information and Survey business group.

G.3 Critical Assets

Not available in this public version, for further details refer to Transgrid. Full details are included in the full Bushfire Mitigation Plan.

G.4 Summary of Maintenance Plan Activities

Not available in this public version, for further details refer to Transgrid. Full details are included in the full Bushfire Mitigation Plan.

G.5 Asset and Operational Responsibilities

Operational Boundaries

The operational boundaries at BBTS and BBW is provided in Table 9. BBTS-BBWF is owned by Transgrid that connects BBW and BBTS.

Table 9 BBTS and BBW Connected parties

Owner of Interfacing Network	Interfacing equipment
BBTS	
AusNet Services	• Terang – Berrybank 220 kV Transmission Line where the 220 kV droppers connect to the landing span at Transgrid's Berrybank Terminal Station (BBTS). • Ballarat – Berrybank 220 kV Transmission Line where the 220 kV droppers connect to the landing span at Transgrid's Berrybank Terminal Station (BBTS).
BBW	
Union Fenosa	33kV underground cable terminations to Berrybank Wind Farm

The specific operational interface points at BBTS and BBW are shown in Figure 10 and Figure 11, respectively. BBTS, BBW and BBTS-BBWF planned energisation date and site operation date are yet to be determined.

Overall emergency management will be carried out by the Asset Monitoring Centre (AMC). Specific operating requirements will be found in operating manual OM 006 – Substation Operating Notes in Southern Region, OM695 – Management of External Hazards, and the operating protocols with AusNet Services and Union Fenosa. Other general operating requirements are included in the relevant operating manuals.

General Information Related to the Operation and Maintenance of the Site

Transgrid, Union Fenosa and AusNet Services are to operate in accordance with the principles of the Code of Practice on Electrical Safety for Work on or Near High Voltage Electrical Apparatus (the Blue Book).

AusNet Services and Union Fenosa staff are to follow Transgrid's Power System Safety Rues (PSSR) when within Transgrid boundaries.

Transgrid has documented the operating arrangements, which considers network safety, in the operating protocols with Union Fenosa and AusNet Services.

The operation of BBTS, BBW and BBTS-BBWF is under the control of the Transgrid control room and is operated as per the operating protocols in place.

Assets under Transgrid operational control are to be operated under the Transgrid PSSR, with any additional requirements required by the Blue Book implemented for work at BBTS, BBW and BBTS-BBWF. This requires the Contractors to be familiar with operating under both sets of rules.

Figure 10 BBTS: Operational Boundary Points between Transgrid, AusNet Services (220 kV lines)

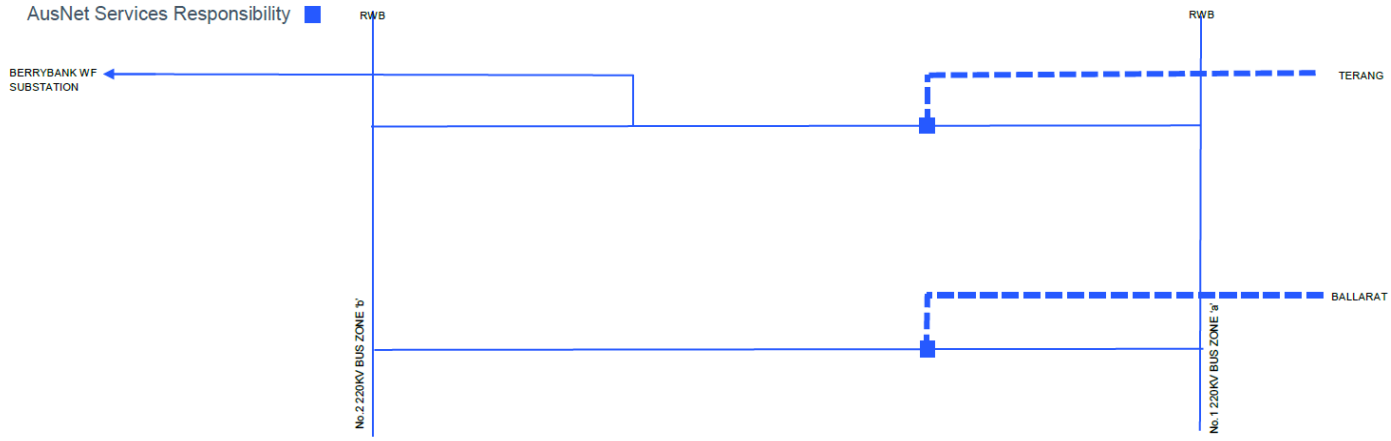
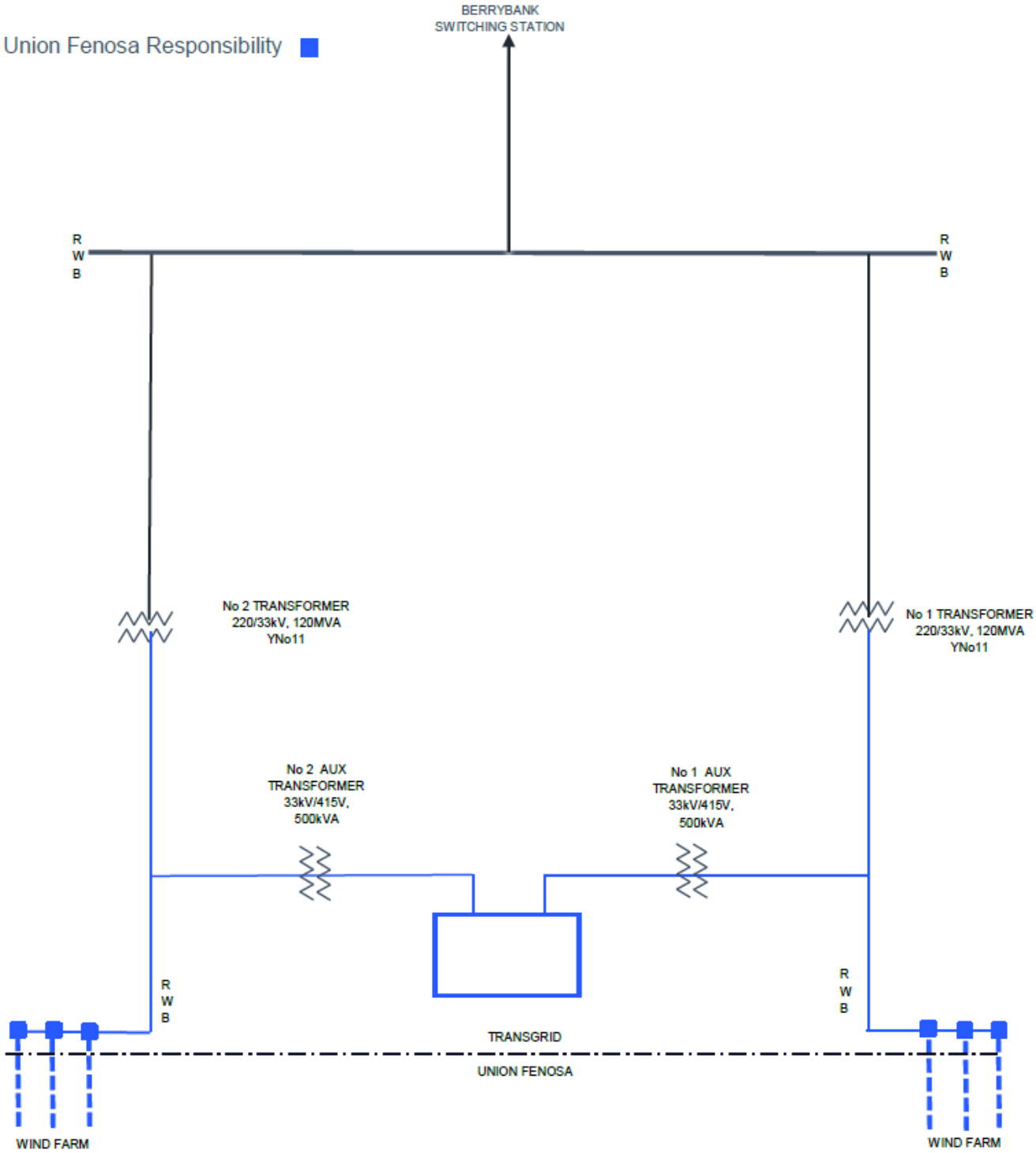


Figure 11 BBW Operational Boundary Points between Transgrid and Union Fenosa (33kV)



G.6 BBTS, BBW and BBTS-BBWF Emergency Contact Numbers

Contact	Contract Number	Reason for contact
3M Oil Solvents	1800 802 902	Additional spill material
Golden Plains Shire	(03) 5220 7111	Emergencies that affect public safety
Berrybank Wind Farm Control Center	(02) 6274 3210 (24/7) 0409 346 935	Contact in the event that an emergency may impact the Berrybank Wind Farm
Police	000 (03) 5596 2055	As required (Lismore Police Station)
Country Fire Authority	(03) 5232 5600 (Colac) (03) 5329 5500 (Wendouree)	Lismore CFA Brigade (District 6 HQ Colac) Wallinduc CFA Brigade (District 15 HQ Wendouree)

G.7 Bushfire Management Artefacts

Not available in this public version, for further details refer to Transgrid. Full details are included in the full Bushfire Mitigation Plan.