

Contents

1.	Annu	al Compliance and Bushfire Reporting	4
2.	Statis	stical Reporting – FY 20	5
	2.1	Tier 1 - Major incidents	5
	2.2	Tier 2 – Incidents	5
	2.3	Tier 3 – Control failure near miss	7
	2.4	Vegetation contact with conductors	g
	2.5	Unintended contact, unauthorised access and electric shocks	10
	2.6	Reliability and Quality of Supply	12
	2.7	Reliability and Quality of Supply – Critical infrastructure incidents	12
	2.8	Network-initiated Property damage events	13
	2.9	Tier 4 implementation	14
	2.10	Design, construction and commissioning	15
	2.11	Inspection (assets)	15
	2.12	Inspections (vegetation) Aerial/Ground based	16
	2.13	Public electrical safety plans and activities	17
	2.14	Internal audits performed on any aspect of the ENSMS (as per AS 5577a clause 4.5.4)	18
	2.15	External audits performed on any aspect of the ENSMS (as per AS 5577a clause 4.5.4)	20
3.	Bush	fire Reporting	21
	3.1	Bushfire risk profile across TransGrid's supply area	21
	3.2	Permanent / temporary declaration of areas by RFS and TransGrid's actions	25
	3.3	Asset and Vegetation Tasks	25
List o	f Tab	les	
Table	1 Tie	r 1 – Major Incidents	5
Table	2 Tie	r 2 - Incidents	5
Table	3 Tie	r 3 – Control failure near miss	7
Table	4 Ve	getation contact with conductors	9
Table	5 Uni	ntended contact, unauthorised access and electric shocks	10
Table	6 Rel	iability and Quality of Supply – Critical infrastructure incidents	12
Table	7 Net	work-initiated Property damage events	13
Table	8 Tie	r 4 implementation	14
Table	9 Des	sign, constructions and commissioning	15
Table	10 In:	spection (assets)	15
Table	11 In:	spections (vegetation) Aerial/Ground based	16
Table	12 Pu	ublic electrical safety plans and activities	17
Table	13 In	ternal audits performed on any aspect of the ENSMS	18

Table 14 External audits performed of any aspect of the ENSMS	20
Table 15: Pre summer bushfire inspections	26
Table 16: Vegetation tasks	26
Table 17: Asset tasks	27

Annual Compliance and Bushfire Reporting

This report provides general information about the performance of TransGrid's Electricity Network Safety Management System (**ENSMS**) as implemented in accordance with the Electricity Supply (Safety and Network Management) (**ESSNM**) Regulation 2014 and Australian Standard AS 5577¹. This report has been produced in accordance with IPART's Electricity Networks Reporting Manual (Safety management systems performance measurement) September 2020 (**Reporting Manual**). In addition the reporting provides an update of TransGrid's bushfire preparations for the upcoming (2020/21) fire season.

In the reporting period, TransGrid continued to maintain its ENSMS and supporting Management Systems to meet the requirements of the ESSNM Regulation. TransGrid's ENSMS defines the interface and integration of the various corporate frameworks and management systems that implement risk controls to ensure that the objectives of the ESSNM Regulation are met. TransGrid is committed to delivering the following objectives through its ENSMS:

- > the safety of members of the public
- > the safety of person(s) working on the network
- > the protection of property (whether or not belonging to TransGrid)
- > the management of safety risks arising from the protection of the environment (for example, preventing bushfires that may be ignited by network assets)
- > the management of safety risks arising from the loss of electricity supply.

TransGrid's ENSMS is supported by the following Management Systems:

- > a Health and Safety Management System certified to AS/NZS 4801
- > an Asset Management System certified to ISO 55001
- > an Environmental Management System certified to ISO 14001.

Section 2 of this report provides an overview of the ENSMS system and performance for the period 1 July 2019 up to and including 30 June 2020 in line with the Reporting Manual Appendix A.

Section 3 of this report covers Bushfire Preparedness for the period from 1 October 2019 to 30 September 2020 as per the Reporting Manual Appendix C. It allows TransGrid to provide meaningful data to IPART and the broader community on bushfire risk mitigation programs as well as our performance in managing bushfire risk.



¹ AS 5577 – Electricity Network Safety Management Systems

2. Statistical Reporting – FY 20

2.1 Tier 1 - Major incidents

Two Major incidents were recorded in the reporting period.

Table 1 Tier 1 - Major Incidents

ESSNM Objective		Description of each major incident reported under the Incident Reporting requirements					
Safety of members of the public		One incident reported. A member of the public climbed a transmission tower and fell sustaining fatal injuries. This incident was fully investigated and all controls were deemed in place and effective.					
Safety of persons working on network		NA					
Protection of property	Third party property	NA					
	Network property	NA					
Safety risks arising from loss of electricity supply		One incident recorded. A fault in protection relay on Line 970 resulted in a circuit breaker fail signal to the Burrinjuck 132kV busbar resulting in an outage of >0.25 system minutes.					

2.2 Tier 2 – Incidents

Six incidents were recorded in the reporting period.

Table 2 Tier 2 - Incidents

ESSNM Objective	Description of each major incident reported under the Incident Reporting requirements
Safety of members of the public	One incident reported.



	A member of the public accessed and climbed a transmission tower receiving minor injuries in the process. This incident was fully investigated and all controls were deemed in place and effective.
Safety of persons working on network	Two incidents reported.
	1. Palisade gate fell resulting in an injury to a third party worker. The injured person was not performing work on behalf of TransGrid but was accessing TransGrid's property. A review of all similar gates has been undertaken to demonstrate that all reasonably practicable controls are in place.
	2. In the process of removing the new internal high voltage connection from a new bushing, TransGrid staff were manually guiding the connection out of the bushing. During this process, a worker aggravated their back.
Protection of third party property	NA
Safety risks arising from loss of electricity supply	Two Reliability Incidents (>0.05 System Minutes) were reported. They are detailed in Section 2.7.



2.3 Tier 3 – Control failure near miss

TransGrid's near miss data is presented in table 3. Commentary on any deviation from long term average performance is recorded in the footnotes.

Table 3 Tier 3 - Control failure near miss

Performance measure	nce Population		Annual functional failures (for reporting period)					
		annual functional failures		Unassisted		Assisted		
		Tanares		No fire Fire		No fire		Fire
				Contained	Escaped		Contained	Escaped
Towers	14,706	0.8	1	0	0	0	0	0
Poles	22,878	2	1	0	0	5 ¹	0	0
Pole-top structures	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Conductor – Transmission OH	13,065 km	28	0	0	0	102 ²	0	0
Conductor – Transmission UG	86km	0	0	0	0	0	0	0
Power transformers	242	3.8	5	0	0	0	0	0
Reactive plant	173	16.2	19	1	0	2	1	0

¹ The FY20 reporting period had a larger than normal number of assisted pole failures due to fire activity.



² The FY20 reporting period had a larger than normal level of external bushfire conductor damage.

Performance measure	Population	5-year average annual	Annual functional failures (for reporting period)						
		functional failures		Unassisted		Assisted			
			No fire Fire		re	No fire	Fire		
				Contained	Escaped		Contained	Escaped	
Switchgear – zone / sub transmission/transmission	14,099	25.6	25	0	0	1	0	0	
Protection relays or systems	3,247	12.4	8	0	0	1	0	0	
Zone / sub transmission/transmission substation SCADA system	2,062	6.2	4	0	0	0	0	0	
Zone / sub transmission/transmission substation Protection Batteries ³	145	NA	NA	NA	NA		NA	NA	



 $^{^{\}rm 3}$ The count of battery systems, included total count of batteries and chargers.

2.4 Vegetation contact with conductors

Table 4 Vegetation contact with conductors

Performance measure	Event count – Current reporting period	Event count – Last reporting period	Event count – Two periods ago	Event count – Three periods ago	Event count – Four periods ago	Comments
Fire starts – grow in	0	0	0	0	1	
Fire start – fall in and blow in	0	0	0	0	1	
Interruption – grow in	0	1	0	3	2	
Interruption – fall-in and blow in	2	1	0	3	3 – all instances off easement trees.	In the current reporting period there were two hazard tree fall-ins during extreme bushfire conditions including one event where the line was out of service.



2.5 Unintended contact, unauthorised access and electric shocks

Table 5 Unintended contact, unauthorised access and electric shocks

Detail	Event Count Current reporting period	Event Count Last reporting period	Event Count Two periods ago	Event Count Three periods ago	Event Count Four periods ago	Comments				
Electric shock and arc flash incidents originating from network assets including those received in customer premises										
Public	0	0	NA	NA	NA					
Public worker	0	0	NA	NA	NA					
Network employee / network contractor	0	0	NA	NA	NA					
Livestock or domestic pet	0	0	NA	NA	NA					
Contact with energised over	erhead network asse	et (e.g. conductor s	trike)							
Public road vehicle	0	0	NA	NA	NA					
Plant and equipment	0	0	NA	NA	NA					
Agricultural and other	0	1	NA	NA	NA					
Network vehicle	0	0	NA	NA	NA					
Contact with energised underground network asset ^e (e.g. conductor strike)										
Plant and equipment	0	0	NA	NA	NA					
Person with hand held tool	0	0	NA	NA	NA					



Detail	Event Count	Event Count	Event Count	Event Count	Event Count	Comments
	Current reporting period	Last reporting period	Two periods ago	Three periods ago	Four periods ago	
Unauthorised network acco	ess (intentional)					
Zone / BSP / Transmission substation / switching station	1	3	NA	NA	NA	One incident was recorded where a member of the public gained access to a high voltage area through cutting the gate padlock. No injuries were recorded.
Tower / poles	2	0	NA	NA	NA	Incidents as described above in Tier 1 & 2
Other (e.g. communication sites)	0	0	NA	NA	NA	
Safe Approach Distance (S	AD)			1		
Network employee / network contractor	0	0	0	0	0	
Public	0	0	NA	NA	NA	
Public Worker	0	0	NA	NA	NA	



2.6 Reliability and Quality of Supply

The reliability and quality of supply performance measures specified in Appendix A Table A.6 of the IPART ENRM apply only to Distribution Network Service Providers.

2.7 Reliability and Quality of Supply – Critical infrastructure incidents

Below is a listing of all reliability events during the reporting period.

Table 6 Reliability and Quality of Supply - Critical infrastructure incidents

Type of critical infrastructure (e.g. hospital, tunnel)	Minutes of supply lost ^b	Cause	Consequential safety impacts associated with supply issue
Boggabri North Substation	23	Plant Failure	None noted
Broken Hill Substation Bus Section	98	Plant Failure	None noted. This was reported as a reliability incident.
96R Glen Innes to Tenterfield Transmission Line	20	External	None noted
Lismore Substation	23	External	None noted. This was reported as a reliability incident.
Tumut and Gadara Substation	16	External	None noted
992 Burrinjuck to Tumut Transmission Line	24	Process Issue	None noted
Burrinjuck Substation Bus	224	External	None noted. This was reported as a major reliability incident.
992 Burrinjuck to Tumut Transmission Line	5	External	None noted



2.8 Network-initiated Property damage events

Table 7 Network-initiated Property damage events

Detail	Event count – current reporting period	Event count – last reporting period	Event count – two periods ago	Event count – three periods ago	Event count – four periods ago	Comments				
Third party property	Third party property (assets including vehicles, buildings, crops, livestock)									
Damage (e.g. Fire, Physical impact or Electrical	0	0	0	0	2					
Network property (including non-electrical assets including vehicles, buildings)										
Damage (e.g. Fire, Physical impact or Electrical)	2	2	2	6	1					



2.9 Tier 4 implementation

The following critical controls within TransGrid's Formal Safety Assessments (FSAs) have been amended or improved during the period

Table 8 Tier 4 implementation

FSA	Amendments/improvements
Worker Safety FSA and Controls	> Updated risk assessment for critical risks and updated bow ties.
Worker durity i dividing definitions	> Inclusion of risk assessment for non-critical risks
	> Review of critical controls
	> Inclusion of references to Victoria
Environment and Property FSA and	> Introduction of the waste reporting module within CAMMS. After implementation, it will allow TransGrid to track all
Controls	hazardous waste movements electronically from generation to disposal.
Bushfire FSA and Controls	> Bow-ties have been updated to articulate - "Risk to TransGrid", "Risk From TransGrid Activity" and "Hot Work Activities"
	> Reviewed against historical events, network performance and industry incidents
	> Review of 2019/20 fire season initiated improvements in systems, processes, reporting and capabilities
	> Development of enhanced key risk metrics to senior management and the Board
	> Enhancements to automated Bushfire work order reporting to working and manager level review forums
Public Safety FSA and Controls	> Bow-ties have been updated to articulate - "Risk to TransGrid", "Risk From TransGrid Activity" and "Other Activities"
Tublic Galety For Caria Controls	> Reviewed against historical events, network performance and industry incidents
	> Identified At Risk Groups and existing programs/activities
	> Updated mapping against industry good practices (ISSC 32)
	> Update to promotion of Public Awareness
	> Completeness check on summary of controls
	> Development of enhanced key risk metrics to senior management and the Board
Reliability FSA and Controls	> The FSA has not been updated for the current reporting year and is due for review in the FY 20-21 reporting period



2.10 Design, construction and commissioning

Table 9 Design, constructions and commissioning

Performance measure	Current reporting period	Last reporting period	Two reporting periods ago	Three reporting periods ago	Four reporting periods ago
Designs for which Safety in Design (SiD) Reports have been completed	497	381	NA	NA	NA
Designs for which Safety in Design (SiD) Reports have been audited	497	381	NA	NA	NA
Project closeout reports completed	60	45	NA	NA	NA
Project closeout reports audited	05	0	NA	NA	NA

2.11 Inspection (assets)

Table 10 Inspection (assets)

Performance measure	Inspectio	n tasks	Co	rrective action ta	Comments	
	Annual target	Achieved	Total Tasks	Open	Outstanding	
Transmission Substations	609	607	4,890	1,670	9	No significant risks identified in outstanding work
Transmission OH	2,043	2,036	2,411	845	20	No significant risks identified in outstanding work
Transmission UG	146	146	160	34	0	

 $^{^{5}}$ TransGrid does not routinely audit project close out reports, but will periodically audit the process



2.12 Inspections (vegetation) Aerial/Ground based

Table 11 Inspections (vegetation) Aerial/Ground based

Bushfire risk category	Population (spans)	Target	Achieved	Outstanding	Comments
Aerial					
Total	38,016	38,016	38,016	0	LiDAR was completed for the entire network in the reporting period.
Ground-based					
Total	-	191	191	0	



2.13 Public electrical safety plans and activities

TransGrid continued to implement its Public Electricity Safety Awareness Plan (**PESAP**) during the 1 July 2019 to 30 June 2020 period. The following programs and activities were undertaken to promote the public knowledge and understanding of electricity network safety hazards, and are targeted to a broad public spectrum on the basis of the key hazardous events identified in TransGrid's ENSMS:

- > Community and stakeholder engagement
- > Communication with property owners who have TransGrid's electricity transmission network infrastructure on their land
- > Communication with emergency services
- > Communication with public authorities
- > Dial Before You Dig service
- > Safety awareness and warning signage

The brief description of these programs with reference to hazard assessments that have identified the 'at risk' groups targeted by each program is provided in TransGrid's PESAP. Specific campaigns are noted in the table below.

Table 12 Public electrical safety plans and activities

Network operator public safety programs / campaigns	Details
A Public Safety Awareness campaign was delivered in June/July 2020. The focus was on awareness of hazards associated with mobile plant travelling and operating in the vicinity of high voltage electrical conductors.	 Key points in the campaign included: High voltage transmission lines can cause fatal electric shocks at a distance of up to 4m – even without physically touching them Be aware of your surroundings at all times ("look up and live") Make use of the fact sheets and guidelines on our website Contact us through the Easement enquiries portal or inquiry line if you are unsure The campaigns target audience included: People living and working around transmission lines. Digital activity targeted to areas surrounding the three substations in the ACT (Canberra, Queanbeyan, and Williamsdale) as well as targeted areas in NSW and Victoria.



2.14 Internal audits performed on any aspect of the ENSMS (as per AS 5577a clause 4.5.4)

Table 13 Internal audits performed on any aspect of the ENSMS

Audit scope	Identified non-compliances	Actions
Electricity – Low Voltage (HSE 1) – Focused on activities performed around low voltage works (under, 100 volts AC or 1,500 volts DC) and evaluated the design and operating effectiveness of the internal controls to manage risks.	There were no non-compliances identified.	> Declutter of existing outdated contractor Health, Safety and Environment (HSE) mechanisms, providing a single set of inspection forms, assigned responsibilities and periodic frequencies. Instruction of non- conforming findings/observations to be captured in CAMMS (TransGrid's Incident, Hazard, Audit, and Compliance Management System).
		Monitor and report on CAMMs open actions across field groups to ensure rectification and closure of Non-Conformance Report (NCRs) within appropriate timeframes.
		 HSE Dashboard analytics to track and report on strategic 1st line assurance mechanisms – Heads Up and Critical Risk Inspections (field).
Hot work and fire risk Audit – to verify compliance to the procedure for hot work and fire risk work	There were no non-compliances identified.	> Ensure Hot Work at minimum kept 15 metres away from any combustible material
conducted by TransGrid workers.		 Minor discrepancies noted on construction contractors Fire Risk Assessment and Control Measures (FRACM) documentation and implementation
Control Assurance Review (November 2019) - Circuit Breakers, Compliance with the Substations Maintenance Plan, mainly, Inspection of asset management aspects at a site level at Buronga and Balranald Substations	Three findings related to internal processes	 Minor improvements relating to maintenance plan implementation and defect reporting. Works Delivery to develop a process to ensure that new issues are reviewed and converted to open in a timely fashion.



Project Close / Asset Acceptance request for P0002049 - Sydney South 415V Aux Replacement (Outstanding items)	One finding related to internal processes	Storage of Safety in Design documents improved for consistency
Easement Maintenance CAR for line 97G	There were no non-compliances identified.	Updates require to Maintenance Scheduled Tasks (MST) in Ellipse to reflect the approved revised easement inspections variance.
A Control Assurance Review (CAR) is conducted on asset management processes related transmission line forced and emergency follow-ups, in particular:	There were no non-compliances identified.	Improvements noted to follow up reports and assessment and recording of After Fault Patrols.
 Initiation of after fault patrols Flagging lines or line sections for attention for next inspection Issuing of Follow-up Forced and Emergency Follow Up Report (FEOR) reports where 		



2.15 External audits performed on any aspect of the ENSMS (as per AS 5577a clause 4.5.4)

Table 14 External audits performed of any aspect of the ENSMS

Audit scope	Identified non-compliances	Actions
The scope of this audit was to assess the extent of implementation, measurement and evaluation, and management review and change management of TransGrid's ENSMS in terms of its: > Asset Bushfire Risk Management Controls > Vegetation Bushfire Risk Management Controls	No non-compliances were identified.	Not applicable
The scope of this audit was to assess the extent of implementation, measurement and evaluation, and management review and change management of TransGrid's ENSMS in terms of its: > Public Safety Risk Management Controls > Worker Safety Risk Management Controls	No non-compliances were identified.	Not applicable



3. Bushfire Reporting

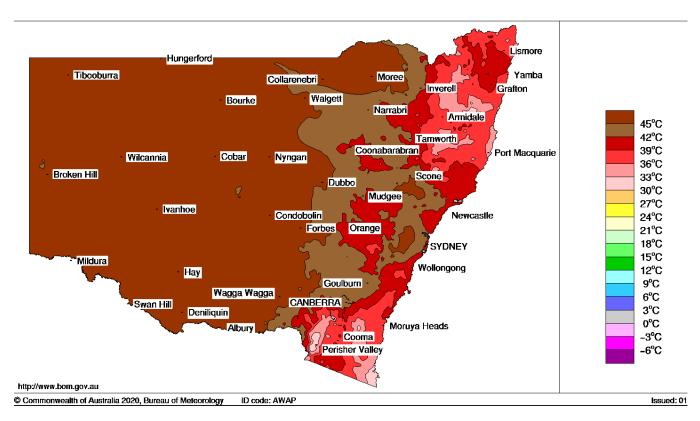
3.1 Bushfire risk profile across TransGrid's supply area

Climate factors relating to bush fire risk include temperature, humidity, wind and the dryness of the landscape. These factors are reflected in Fire Danger Ratings and Total Fire Bans issued by the Rural Fire Service (**RFS**). Of these factors, historical data for maximum temperature and rainfall is available from the Australian Government Bureau of Meteorology, as shown in Figure 1 and 2.

Figure 1 Maximum Temperature across NSW/ACT

Highest Maximum Temperature (°C) 1 October 2019 to 30 September 2020

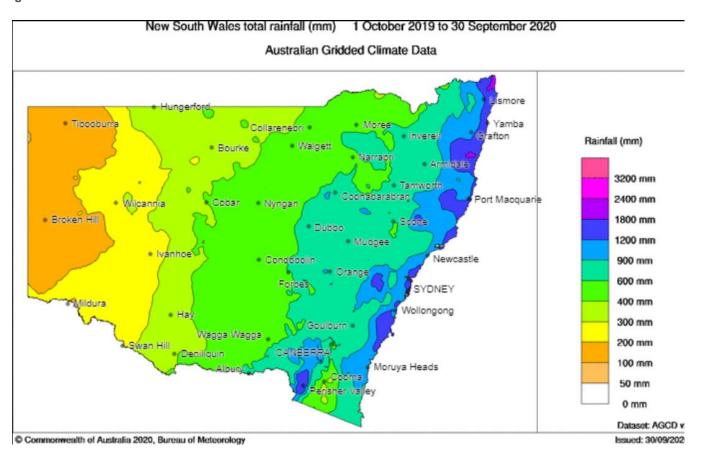
Australian Bureau of Meteorology



Reference Datasource: http://www.bom.gov.au/jsp/awap/temp/index.jsp



Figure 2 Maximum Rainfall across NSW/ACT

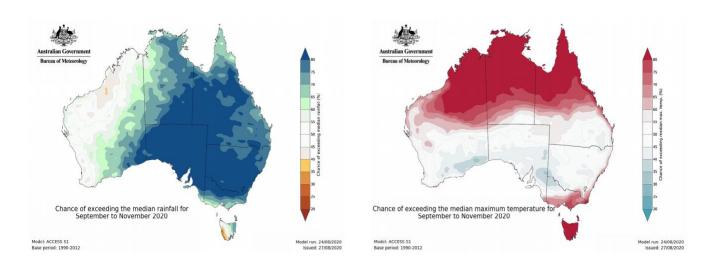


Reference Datasource:

 $\frac{\text{http://www.bom.gov.au/climate/maps/rainfall/?variable=rainfall\&map=totals\&period=12month\®ion=ns\&yea}{r=2020\&month=09\&day=30}$

The 2020/21 fire season will be driven by vastly different climate drivers than the previous two fire seasons. Rainfall deficiencies over large parts of drought affected New South Wales have reduced significantly in 2020 compared to this time last year, and soil moisture has returned to average in many areas. Figure 3 highlights the rainfall and temperature outlook which is predicted to be wetter and cooler than average conditions.

Figure 3 La Nina Outlook



Datasource: https://www.bnhcrc.com.au/hazardnotes/77



With a La Niña ALERT current, the rainfall outlook appears favourable for much of the state. Whilst the bushfire outlook on the balance of the forecast is normal for NSW for the outlook period, there is a need to monitor for escalation to fire danger associated with windy weather events that can often present during this period. Recent and forecast rain, combined with warmer than average minimum temperatures, may provide ideal growing conditions for cropping and grassland areas. This spring growth has the potential to increase grass and crop fuel loads as it dries through summer, and this will be monitored closely.

TransGrid will remain in close contact with the RFS (NSW and ACT) and Energy Utilities Functional Area Coordinator EUSFAC across the season.

The bushfire risk profile across NSW and ACT related to transmission line spans, substations and communication sites is represented in the Figure 4 Figure 5, and Figure 6.

Figure 4 Transmission Line Span Bushfire Risk Profile

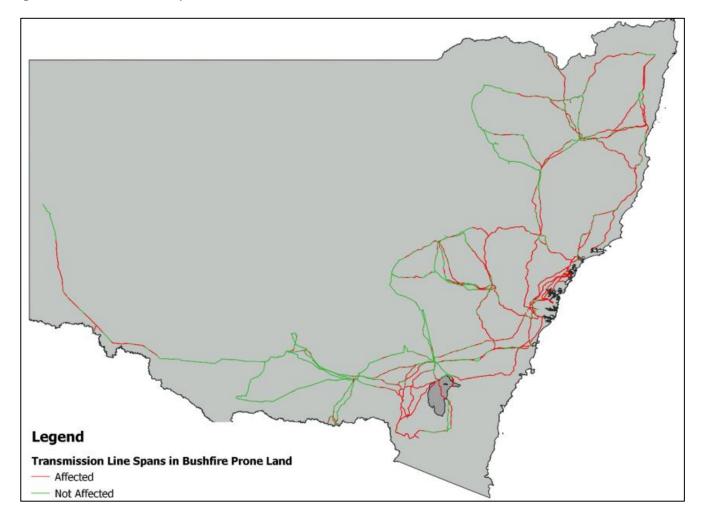


Figure 5 Substation Bushfire Risk Profile

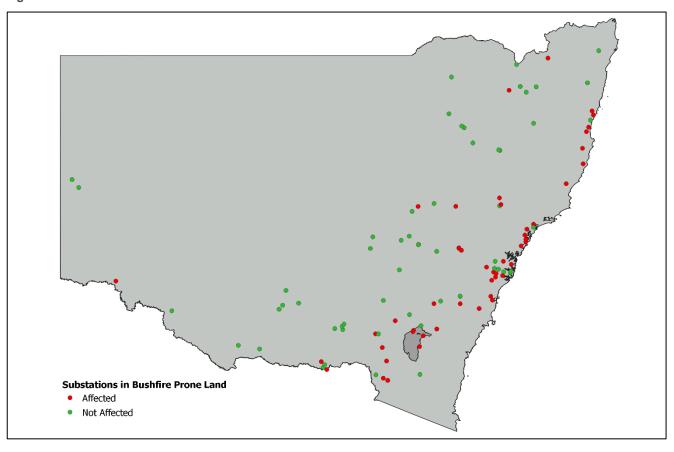
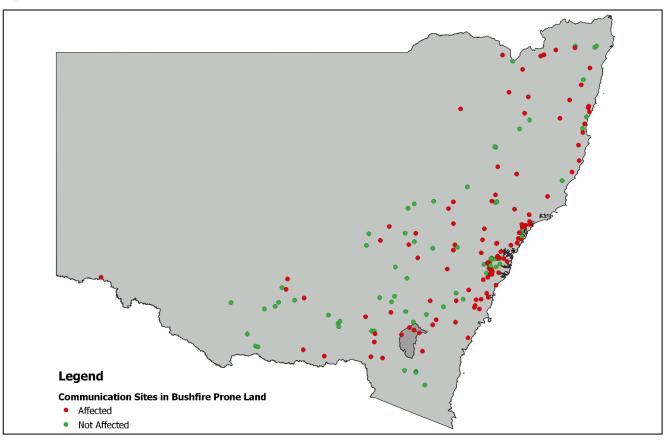


Figure 6 Communication Site Bushfire Risk Profile





3.2 Permanent / temporary declaration of areas by RFS and TransGrid's actions

Fire Areas 11 and 12 were declared as an early start 1 August 2020. Fire Areas 1,2,3,5 and 6 were declared as an early start 1 September 2020.

The early start of the bushfire danger period was communicated by TransGrid to staff for the 6 LGA's in August and on 1 September to other 21 LGA's. This communication was in accordance with the requirements set out in Section 5.2 of the Bushfire Risk Management Plan.

The email reminded staff of the threats to bushfire risk when performing work on the assets, and the actions they need to take prior to commencing work in the affected Fire Area. For example, completing the TransGrid fire risk assessment form that requests the staff to identify the weather conditions and appropriate controls to implement prior to commencing work.

TransGrid published a HSE notice related to the Bushfire Danger Period (2020-2021 season). A bushfire risk assessment, as per TransGrid's Bushfire Risk Management Plan, was completed on work orders in the early start area that satisfy the below criteria:

- > Work orders are specific to managing the asset's bushfire risk exposure.
- > Work orders are on assets located in the affected Fire Area.
- > Work orders are open or outstanding.

The bushfire risk assessment is performed to provide assurance that TransGrid's bushfire risk exposure of assets is managed to as low as reasonably practicable.

3.3 Asset and Vegetation Tasks

The status of TransGrid's pre summer bushfire inspections is given in the tables below.

All pre-season bushfire inspections have been completed. Five transmission line defects were outstanding at the start of the period. This will be actioned in accordance with the prioritisation methodology in the Bushfire Management Plan. There are no significant risks or unusual trends noted in the performance of this year's bushfire preparation.



Table 15: Pre summer bushfire inspections

Pre-summer bushfire inspections	Population (spans / poles)	Target	Achieved	Outstanding	Comments
Inspections	38,133	38,128	38,128	NA	

Table 16: Vegetation tasks

Bushfire risk category	Status	Encroachment Classification A1	Encroachment Classification A2	Encroachment Classification A3	Encroachment Classification A4	Hazard trees
Mixed	Open	0	0	0	0	0
	Outstanding	0	0	0	0	5
TOTAL	Open	0	0	0	0	0
	Outstanding	0	0	0	0	5

Of the 5 Hazard Trees still open after the reporting period 4 have been closed since the reporting period but before submission of this report.



Table 17: Asset tasks

Asset Category	Status		Withi	n bushfire p	orone areas		Outside bushfire prone areas				
		Work order priority 1 24 hours	Work order priority 2 1 month	Work order priority 3 3 months	Work order priority 4 12 months	Work order priority 5 Next outage/ maintenance	Work order priority 1 24 hours	Work order priority 2 1 month	Work order priority 3 3 months	Work order priority 4 12 months	Work order priority 5 Next outage/ maintenance
Substation	Open	0	0	2	0	0	0	0	2	0	1
	Outstanding	0	0	0	0	0	0	0	0	0	0
Transmission	Open	0	34	70	110	34	0	53	50	107	36
Line	Outstanding	0	0	2	0	0	0	0	3	0	0
Automation	Open	0	0	0	0	0	0	0	0	0	0
	Outstanding	0	0	0	0	0	0	0	0	0	0
Network	Open	0	1	1	0	0	0	0	0	0	0
Property	Outstanding	0	0	0	0	0	0	0	0	0	0

