

Annual Safety Performance and Bushfire Preparedness Report

2021/22

Electricity Network Safety Management System



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1. Introduction

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 5577. This report has been produced in accordance with IPART's *Electricity Networks Reporting Manual (Safety management systems performance measurement) September 2022* (Reporting Manual). In addition, the reporting provides an update of Transgrid's bushfire preparations for the upcoming (2022/23) 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.

This report includes all network assets (including prescribed and contestable assets) operated by Transgrid within NSW and the ACT.

Section 2 of this report provides an overview of the ENSMS safety performance for the period 1 July 2021 to 30 June 2022 in line with Reporting Manual Appendix A.

Section 3 of this report covers Bushfire Preparedness for the period from 1 October 2021 to 30 September 2022 in line 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.

2. Annual Safety Performance Reporting for 2021/22

2.1. Tier 1 - Major incidents

Major incidents² are where electricity power lines, associated equipment or electricity structures which form part of Transgrid’s electricity network are involved in the incident and include the following:

- Significant injury to person/s
- Significant property damage > \$500,000 or where fires which have burnt an area > 10 hectares and where the Commissioner has taken charge
- Supply interruption amounting to > 0.25 system minutes.

For a more comprehensive description of Tier 1 incidents please refer to the *Electricity Networks Reporting Manual – Incident Reporting* (Reporting Manual - Incident Reporting).

Table 1: Tier 1 – Major Incidents

ESSNM Objective		Description of each major incident reported under the Reporting Manual - Incident Reporting requirements
Safety of members of the public		A member of the public contacted an in-service Transgrid 132kV overhead line while operating a piling rig resulting in injury.
Safety of persons working on network		No incidents to report.
Protection of property	Third party property	No incidents to report.
	Network property ¹	No incidents to report.
Safety risks arising from loss of electricity supply ²		No incidents to report.

¹ Network property losses are not reportable under IPART’s Reporting Manual - Incident Reporting requirements. For the purpose of this report, Transgrid is to report each event in which losses exceed \$500,000 in relation to damage caused to *electricity works* (electricity power lines or associated equipment or electricity structures that form part of a transmission or distribution system) as defined in the *Electricity Supply Act 1995*.

² As defined for major reliability incidents in IPART’s Reporting Manual – Incident Reporting.

2.2. Tier 2 – Incidents

Tier 2 Incidents are where electricity power lines, associated equipment or electricity structures which form part of Transgrid’s electricity network are involved in the incident and include the following:

- An injury not categorised as Major but leads to person/s being hospitalised or receiving treatment from a registered health care practitioner
- Property damage > \$100,000 or where fires which have burnt an area > 10 hectares and where the Commissioner has not taken charge or where fires have impacted environmentally sensitive areas
- Supply interruption amounting to > 0.05 system minutes.

For a more comprehensive description of Tier 2 incidents please refer the Reporting Manual - Incident Reporting.

Table 2: Tier 2 - Incidents

ESSNM Objective	Description of each incident reported under the Reporting Manual - Incident Reporting requirements
Safety of members of the public	No incidents to report.
Safety of persons working on network	<ol style="list-style-type: none"> 1. Employee sustained eye injury following electrical arcing event. 2. Contractor injured back lifting builder's plastic. 3. Contractor finger was crushed while replacing tower insulators. 4. Contractor rolled ankle when exiting excavator on uneven surface. 5. Contractor received finger laceration while replacing tower insulators which required stitches. 6. Contractor jumped from back of stationary truck, struck a branch, which caused a deep cut on their leg and stitches were required. 7. Contractor twisted ankle on wet, uneven ground. 8. Contractor fractured their wrist trying to slow a moving pipe with a piece of timber. 9. Contractor injured their shoulder while completing vegetation maintenance. 10. Contractor slipped on a scaffold, struck part of a wall and injured their ribs. 11. Contractor fractured their finger after dropping UG 330kV cable offcut onto it.
Protection of third party property	No incidents to report.
Safety risks arising from loss of electricity supply ³	No incidents to report.

³ As defined for reliability incidents in IPART’s Reporting Manual – Incident Reporting.

2.3. Tier 3 – Control failure near miss

The following table provides a breakdown of Transgrid’s asset types, the population of these asset types, functional failure details and whether these failures resulted in a fire.

Table 3: Tier 3 – Control failure near miss

Performance measure	Population	5-year average annual functional failures ⁴	Annual functional failures (for reporting period)					
			Unassisted			Assisted		
			No fire	Fire		No fire	Fire	
				Contained	Escaped		Contained	Escaped
Towers	14,694	0.6	0	0	0	0	0	0
Poles (including stay poles) ⁵	23,016	2.4	0	0	0	2	0	0
Conductor – Transmission OH ⁶ (km)	11,363	26.6	4	0	0	7	0	0
Conductor – Transmission UG ⁷ (km)	93.8	0	0	0	0	0	0	0
Power transformers ⁸	249	5.6	9	1	0	1	0	0
Reactive plant ⁹	181	14.2	6	2	0	1	0	0
Switchgear – transmission	14,702	19.2	16	0	0	0	0	0
Protection relays or systems	3,383	10	4	0	0	2	0	0
Transmission substation SCADA system	2,046	6.2	6	0	0	1	0	0
Transmission substation Protection Batteries ¹⁰	248	18.2	6	0	0	0	0	0

⁴ Transgrid defines an asset functional failure to be when a network asset is unable to meet the expected or specified performance standard.

⁵ Transgrid pole population is the count of pole structures. e.g., a structure consisting of 3 poles is counted as 1

⁶ OH means 'overhead'. Transmission voltages are generally 33kV AC nominal and above. Transmission conductors form part of a transmission network.

⁷ UG means 'underground'.

⁸ Power Transformers are transformers where the secondary/output voltage is 5kV nominal or above.

⁹ Reactive plant includes reactors, capacitors, and static VAR compensators

¹⁰ The count of battery systems includes total count of batteries and chargers.

Commentary on Table 3:

- In 2019/20, a large number (> 100) of conductors were damaged due to external bushfires. Therefore the 5-year functional average failure is much higher than the number recorded in 2021/22. In 2021/22 we started recording conductor length by route length instead of by circuit length which has resulted in a reduction in the lengths reported.
- In 2021/22, 11 power transformers failed, compared to 4 in 2020/21, largely due to increased failures of transformer protection devices and tap-changers. Transformer protection devices refers to components of the transformer that interface to the protection relays, such as oil pressure, temperature, and buchholz sensors. Noting that no failures of power transformers resulted in loss of supply.
- The other functional failures in 2020/21 are comparable to the 5-year average for most asset classes.
- The following performance measures are not applicable (as Transgrid does not own any of these assets) to Transgrid; hence, these are excluded from this report:
 - Poles (street lighting columns/poles)
 - Conductor – HV OH and HV UG. HV means 'high voltage'. OH means 'overhead'. UG means 'underground'. HV are voltages 1kV AC nominal and above and not part of a transmission network
 - Conductor – LV OH and LV UG. LV means 'low voltage'. LV are voltages below 1kV AC nominal
 - Transgrid is unable to provide accurate statistics for Pole top structures/components, hence these are excluded from this report
 - Service line OH and UG. As defined in the NSW Service and Installation Rules
 - Distribution transformers
 - Switchgear – zone/sub-transmission substation
 - Switchgear – distribution (OH)
 - Switchgear – distribution (Ground based)
 - SCADA system – zone/sub-transmission substation
 - Protection batteries – zone/sub-transmission substation
 - Network SAPS

2.4. Vegetation contact with conductors

The following table lists all events where vegetation has contacted Transgrid conductors leading to a fire or a supply interruption.

Table 4: Vegetation contact with conductors

Performance measure ¹¹	Event count					Comments on 2021/22 events
	Current reporting period	Last reporting period	Two periods ago	Three periods ago	Four periods ago	
Fire starts – grow in	0	0	0	0	0	
Fire start – fall in and blow in	0	0	0	0	0	
Interruption ¹² –grow in	0	0	0	1	0	Although no grow in loss of supply events were recorded, one line was proactively taken out of service to remove trees within the safe approach distance.
Interruption –fall-in and blow in	2	1	2	1	0	One during a windstorm and one during normal conditions. Both were Hazard tree fall-ins.

¹¹ Vegetation hazard definitions as per the Industry Safety Steering Committee Guide for the Management of Vegetation in the Vicinity of Electricity Assets (ISSC3).

¹² Includes momentary interruptions.

2.5. Unintended contact, unauthorised access and electric shocks

The following table lists all events where someone, livestock or domestic pet, vehicle or machinery has inadvertently contacted Transgrid assets resulting in an electric shock or injury, unauthorised access, or a breach of safe approach distances.

Table 5: Unintended contact, unauthorised access and electric shocks

Detail	Event count					Comments on 2021/22 events
	Current reporting period	Last reporting period	Two periods ago	Three periods ago	Four periods ago	
Electric shock¹³ and arc flash incidents¹⁴ originating from network assets¹⁵ including those received in customer premises						
Public	0	0	0	0	NA	
Public worker	0	0	0	0	NA	
Network employee / network contractor ¹⁶	1	2	0	0	NA	Employee was performing phase testing on an auxiliary transformer, when the employee inadvertently shorted the test leads, leading to a minor electrical arcing event. A small piece of plastic defected, striking the team member in the eye.
Livestock or domestic pet	0	0	0	0	NA	
Contact with energised overhead network asset (e.g. conductor strike)						
Public road vehicle ¹⁷	0	0	0	0	NA	
Plant and equipment ¹⁸	1	1	0	0	NA	Member of the public made contact with an in-service Transgrid 132kV overhead line while operating a piling drill rig.
Agricultural and other ¹⁹	0	0	0	1	NA	
Network vehicle	0	0	0	0	NA	
Contact with energised underground network asset (e.g. conductor strike)						
Plant and equipment	0	0	0	0	NA	

¹³ All electric shocks are to be reported except those resulting from static discharge, defibrillators, where the system is nominally extra low voltage or involving the DC rail traction system.

¹⁴ Incidents that result in a burn or other injury requiring medical treatment and result from exposure to an arc.

¹⁵ Events caused by network assets, network asset defects or network activities, including shocks received inside customer installations are reported.

¹⁶ Includes all classes of authorised persons.

¹⁷ Including plant and equipment packed up for travel (i.e. plant and equipment travelling on a public road to or from worksite).

¹⁸ Cranes, elevated work platforms, cherry pickers, excavators, hand held tools, etc.

¹⁹ Examples include agricultural equipment, aircraft and watercraft.

Person with hand held tool	0	0	0	0	NA	
Unauthorised network access (intentional)						
Transmission substation / switching station	5	5	1	3	NA	5 unauthorised access events occurred at 4 different transmission substations.
Tower / poles	0	1	2	0	NA	
Other (e.g. communication sites)	0	1	0	0	NA	
Safe Approach Distance (SAD)²⁰						
Network employee / network contractor	1	1	0	0	0	Contractor traversed excavator in area not covered by risk assessment in switchyard and breached SAD of 330kV in-service overhead line.
Public	0	0	0	0	NA	
Public Worker	0	0	0	0	NA	

Commentary on Table 5:

- Only NSW electricity distributors have obligations under the NSW Accredited Service Provider (ASP) Scheme, hence no events associated with ASPs have been reported.
- Transgrid does not own any Distribution or Zone Substations; hence reporting on these assets is not applicable.
- Excludes unauthorised access to non-network locations such as depots.

2.6. Reliability and Quality of Supply

The performance measures specified in Table A.6 of the Reporting Manual is only applicable to Distribution Network Service Providers.

²⁰ Encroachment into the applicable Safe Approach Distance for the type of individual involved.

2.7. Reliability and Quality of Supply – Critical infrastructure incidents

Below is a listing of all Transgrid loss of supply events which impacted critical infrastructure. Transgrid counts all loss of supply events which do not meet exclusion criteria set out by the Australian Energy Regulator in the Service Target Performance Incentive Scheme (STPIS). Exclusion events include the following:

- Outages shown to be primarily caused or initiated by a fault or other event on a third-party system.
- Outages on assets that are not providing prescribed transmission services.
- Outages caused by a direction from emergency services or AEMO.

Table 6 Reliability and Quality of Supply – Critical infrastructure incidents

Type of critical infrastructure ²¹	Minutes of supply lost	Cause	Consequential safety impacts associated with supply issue
876 Moree to Moree Solar Farm tee Bellata Line Relay	122	External	Nil
Molong 132kV Bus	139	Plant Failure	Nil

Commentary on Table 6:

- There were a further 5 loss of supply events in 2021/22 meeting one or more exclusion criteria set out by the AER in STPIS.
- No quality of supply incidents occurred during the 2021/22 which impacted critical infrastructure apart from the loss of supply events shown above.
 - An assessment of PQ performance (measuring voltage variation, voltage unbalance, voltage harmonics and flicker) of the Transgrid network was undertaken across 73 sites during 2021.

²¹ All Transgrid assets are considered critical infrastructure

2.8. Network-initiated Property damage events

The following tables lists all events leading to either third party or Transgrid property damage which have been initiated by Transgrid's electricity assets or asset life cycle activities.

Table 7: Network-initiated Property damage events

Detail	Event count ²²					Comments
	Current reporting period	Last reporting period	Two periods ago	Three periods ago	Four periods ago	
Third party property (assets including vehicles, buildings, crops, livestock)						
Damage (e.g. Fire, Physical impact or Electrical)	0	7	0	0	0	Nil to report
Network property (including non-electrical assets including vehicles, buildings)						
Damage (e.g. Fire, Physical impact or Electrical)	0	1	2	2	2	Nil to report

In 2021/22, the following events were excluded from the counts above:

- Minor damage to Transgrid assets, plant, machinery, and property, during construction or maintenance activities or vehicle movements.
- Failure of mobile plant or machinery during construction or maintenance activities.
- Asset failures which only resulted in damage to the asset itself.

²² Event counts should include any event where there is a reasonable likelihood that damage was caused by *electricity works* (electricity power lines or associated equipment or electricity structures that form part of a transmission or distribution system).

2.9. Tier 4 Control implementation

The following table provides an update on Transgrid’s five formal safety assessments and any related risk treatment action plans. Transgrid’s formal safety assessments are based on *AS5577 – Electricity Network Safety Management Systems*. A formal safety assessment considers the hazards that might be associated with activities on or near the electricity network and comply with the principles of *AS/NZS ISO 31000 - Risk Management*.

Table 8: Amendments and improvements to Formal Safety Assessments (FSA) or associated Risk Treatments²³

FSA	Amendments / improvements
Public Safety	No changes occurred during 2021/22. This FSA is currently under review.
Worker Safety	No changes occurred during 2021/22.
Bushfire	No changes occurred during 2021/22. This FSA is currently under review.
Environment and Property	No changes occurred during 2021/22. This FSA is currently under review.
Reliability Safety	<p>The FSA was approved in September 2022, and included the following changes:</p> <ul style="list-style-type: none"> • Review of new and emerging technologies and threats. • A significant revision of bowties with improved level of analysis and identification of controls. • An update to external stakeholder communication. • Established three risk treatment actions. One related to the rapid transition from coal fired generation to renewable energy and the actions necessary to make the network secure. The second and third risk treatments are associated with improvements to operational technology, cyber and physical security improvements.

²³ Adjustment or modification to Transgrid's formal safety assessments, or risk treatment action plans, including those changes informed by consideration of the results of the investigation and analysis of incidents, near misses or asset failures, where Transgrid has assessed that existing assessments or risk treatments do not eliminate or reduce risk so far as is reasonably practicable.

2.10. Design, construction and commissioning

The following table provides counts of completed Safety in Design reports, safety reviews and project close out reports.

Table 9: Design, construction and commissioning

Performance measure	Number of designs/projects				
	Current reporting period	Last reporting period	Two periods ago	Three periods ago	Four periods ago
Designs for which Safety in Design (SiD) Reports have been completed	225	277	497	381	NA
Designs for which Safety in Design (SiD) Reports have been audited	225	277	497	381	NA
Safety reviews performed ²⁴	698	262	98	NA	NA
Project closeout reports completed	143	172	60	45	NA
Project closeout reports audited	0	0	0	0	NA

Commentary on Table 9:

- The implementation of Transgrid’s “Heads Up” program occurred in 2021/22. The “Heads Up” program saw 400+ leaders trained in completing and recording safety conversations in the field. As a result, a substantial increase in Safety Reviews was recorded compared 2020/21.
- Only NSW electricity distributors have obligations under the NSW Accredited Service Provider Scheme, hence performance measures related to the following categories are not applicable:
 - Contestable designs
 - Contestable projects

²⁴ A safety review includes checking that work on or near the network is being performed safely. Transgrid includes pre-mobilisation audits, post mobilisation audits and project health checks, process audits which cover critical risks and key hazards and heads-up conversations which focus on safety aspects of projects.

2.11. Inspection (assets)

The following table provides counts of Inspection and Corrective action tasks planned or completed during 2021/22, split into Transmission substations, overhead, and underground network assets. At Transgrid, maintenance tasks are allocated as work orders and for Transmission lines, inspection tasks generally include large numbers of spans on a single work order such as an entire feeder or hundreds of spans. Common types of activities in the following table include:

- Transmission line aerial imagery, thermography surveys, compliance and climbing inspections.
- Annual substation or 6 monthly inspections, thermography surveys, and regular inspections of specific assets.
- Substation condition based tasks including equipment oil sampling, insulator sampling, equipment condition assessments and bushing testing tasks.
- Transmission lines defects including repairs to conductors, bonds, fittings, warning signage, pole replacements and termite treatments.

Table 10: Inspection (assets)²⁵

Performance measure	Inspection tasks				Corrective action tasks				Comments
	Planned ²⁶ inspections	Achieved ²⁷	Open ²⁸	Outstanding ²⁹	Tasks identified	Achieved	Open	Outstanding	
Transmission Substations	364	364	1,322	0	1,106	1,092	1,217	14	Refer comments below
Transmission OH	902	901	1,727	1	602	593	313	9	
Transmission UG	136	136	329	0	84	84	17	0	

Commentary on Table 10:

- Pre-summer bushfire activities counted in Tables 15 and 17 have been excluded from this table, namely 347 Substation inspections, 842 Transmission line inspections, 133 Substation corrective actions and 1,311 Transmission line correction actions.
 - For the 10 x Transmission Line outstanding tasks:
 - > 4 have been completed since 30 June 2022.
 - > Remaining tasks are to be combined with other projects or are low priority and not urgent.

²⁵ Inspection counts do not include activities reported in Table 15 or 17. Includes all inspection counts due before 30 June 2022.

²⁶ Includes all 'Open' and 'Outstanding' tasks from the previous reporting period.

²⁷ Inspection tasks must only be reported as 'Achieved' when all associated corrective action tasks to address the faults of a particular asset have been identified. Achieved counts include tasks completed prior to the 30 June 2022, which were not due until after 30 June 2022.

²⁸ 'Open' and 'Outstanding' tasks are those tasks categorised as such at the end of the reporting period.

²⁹ Commentary provided to explain the management of risk associated with outstanding tasks and when the outstanding tasks are expected to be completed.

- For the 14 x Transmission Substations outstanding tasks:
 - > 6 have been completed since 30 June 2022.
 - > Remaining tasks are low priority and not urgent.
- Transgrid does not own any distribution assets, and so activities related to zone substations, distribution substations, distribution mains or network SAPS are not applicable.

2.12. Inspections (vegetation) Aerial/Ground based

The following table provides the number of vegetation inspections undertaken, either aerially or via a ground based. At Transgrid, vegetation inspections are allocated as work orders and these tasks generally include large numbers of spans on a single work order such as an entire feeder or hundreds of spans. 429 pre-summer vegetation related bushfire inspections counted in Table 15 have been excluded from this table.

Table 11: Inspections (vegetation) Aerial/Ground based

Inspection type ³⁰	Population (no. of spans)	Target	Achieved	Outstanding	Comments
Aerial					
Total	37,847	26	26	0	<ul style="list-style-type: none"> • All LiDAR Inspections • All inspections occurred before 1/10/2021, so not appearing in Table 15.
Ground-based					
Total	37,847	60	60	0	<ul style="list-style-type: none"> • Includes compliance inspections where a LiDAR inspection did not occur or routine entire easement inspection • Most of these inspections occurred before 1/10/2021 so not appearing in Table 15.

- The population shown is for all Transgrid's assets and is independent of the type of inspection undertaken.

³⁰ Inspection counts do not include activities reported in Table 15 or 17. Includes all inspection counts due before 30 June 2022.

2.13. Public electrical safety plans and activities

Transgrid continued to implement its Public Electricity Safety Awareness Plan (PESAP) during 2021/22. The following programs and activities were undertaken to promote public knowledge and understanding of electricity network safety hazards, and are targeted to a broad public spectrum based on 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 businesses operating in vicinity of our assets
- Communication with emergency services
- Communication with public authorities
- Social media updates related to significant network incidents and bushfire preparedness activities
- Dial Before You Dig service
- Look Up and Live membership
- Safety awareness and warning signage

Specific campaigns are noted in the table below.

Table 12 Public electrical safety plans and activities³¹

Transgrid public safety programs / campaigns	Details
Public Safety Awareness campaign	<p>The Stay Safe campaign ran during June - July 2022, with the objectives of:</p> <ul style="list-style-type: none"> • raising awareness of the safety hazards for people working near transmission lines, and • to provide information and guidance on what can and cannot be done near transmission lines. • directing audience to Transgrid website. https://www.transgrid.com.au/customers-community/community-safety/living-and-working-near-transmission-lines <p>Communication method and dates</p> <ul style="list-style-type: none"> • Newspapers adverts (ACT) <ul style="list-style-type: none"> - Canberra Times and Canberra Weekly <p>Social media campaign (all areas where Transgrid has assets)</p> <ul style="list-style-type: none"> • Facebook, LinkedIn and Instagram

³¹ Details the plans and other activities that Transgrid undertook to provide safety information to the public. Examples may include a publication of a Public Electrical Safety Awareness Plan, advertisements associated with electrical safety and awareness, publication of a bushfire risk management plan, shocks and tingles awareness program, etc.

<p>Joined Look Up and Live</p>	<p>Transgrid joined Essential Energy, Endeavour Energy and other network service providers from around Australia in displaying its overhead assets in the Look Up and Live application. https://www.transgrid.com.au/customers-community/community-safety/look-up-and-live</p> <p>In August - September 2022, an additional social media campaign ran to raise awareness and promote the usage of the Look Up and Live application in NSW, the ACT and parts of Victoria where Transgrid operates electricity assets.</p>
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2.14. Internal audits performed on any aspect of the ENSMS (as per AS 5577a clause 4.5.4)

Transgrid undertakes internal audits through either its Audit Branch or via other business units as part of the Three Lines of Defence operating model for risk and compliance management. The table below lists audits and associated actions and non-compliances which are relevant to the ENSMS.

Table 13: Internal audits performed on any aspect of the ENSMS

Audit scope	Identified non-compliances ³²	Actions
Major Projects Quality Management	Nil	<ul style="list-style-type: none"> Update the Project Risk Management Procedure which will include Quality as a Level 1 risk category. Once this is completed, an education process will be conducted (this may be through facilitating risk workshops or formal risk management training)
Major Projects – Environmental Risk Management	Nil	<ul style="list-style-type: none"> Agreed the formal policy will be created which includes the processes for the management of vegetation requirements and consideration will be undertaken on how offsets will be managed. The project teams will be informed and trained on the Project Management System Framework Environment processes
Cyber Incident Response (Framework Design Review)	Nil	<ul style="list-style-type: none"> Create criteria and steps for handover processes between the security team and crisis management team for high severity security incidents. Enhance the Cyber Security Incident Response Management Plan to include containment and restoration activities Amend the cyber incident response documentation to include/link to the security contact list and formalised escalation path
<p>Transgrid Substations Oil Containment Audit</p> <ul style="list-style-type: none"> Review the readiness and effectiveness of the oil containment systems if there is a system failure that results in loss of oil. 	Nil	<ul style="list-style-type: none"> Review and update the Oil Containment Risk Assessment against standard design manual requirements. Review process to include key design elements and the risks associated with existing sites not built to current standard.

³² Only non-compliances that are related to ENSMS or safety issues.

Audit scope	Identified non-compliances ³²	Actions
<ul style="list-style-type: none"> The audit consisted of a desktop review of documents and plans, inspections of three substation sites and interviews with relevant Transgrid employees. 		<ul style="list-style-type: none"> Review and determine requirements (legislative, regulatory etc.) for dams to be fenced and Transgrid's position on retrospective application Run annual emergency response plan desktop refresher discussion at Maintenance Team meetings Transgrid to review redundant assets across the network
<p>Network Performance Review Meetings - Forced and Emergency outages caused by process failure.</p> <ul style="list-style-type: none"> Review of events where BAU process failures have caused Forced or Emergency Network Outages. 	Nil	<ul style="list-style-type: none"> Review training and procedures for ensuring the key protection links are tightened correctly after switching. Project Commissioning Processes and Training to be reviewed to ensure the management of temporary commissioning arrangements are appropriately recorded, tracked and completed. Asset Manager to consider the cost effectiveness of replacing existing relays with stud terminals in favour of relays with shielded terminals or installation of permanent perspex barriers at all sites. Delivery to review processes implemented under the Corrective Maintenance Procedure for ensuring defect work is carried out before due date and in accordance with variation process.
<p>Network Property – Control Assurance Review</p> <ul style="list-style-type: none"> Asset capture processes Planned maintenance processes Corrective maintenance processes Contract monitoring processes 	Nil	<ul style="list-style-type: none"> Review handover practices and establish internal documented procedure for review and handover of asset data. Review internal processes for active work orders and reporting of overdue items Recommunicate to all groups the Asset Inspection Manager issue creation procedure Quarterly spot checks of contractor audits
<p>OT Networks – SSZ – Control Assurance Review</p> <ul style="list-style-type: none"> Routine maintenance processes Issues and defect management processes Administrative controls processes Asset data capture processes 	Nil	<ul style="list-style-type: none"> Review data capture process and enhance asset data rules Review OT Cyber Security Maintenance Plan Review internal processes for active work orders and reporting of overdue items Recommunicate to all groups processes and procedures for the creation of corrective maintenance tasks
<p>Ground and Climbing Inspections – Control Assurance Review</p> <ul style="list-style-type: none"> Completion of inspections Management of defects Oversight of contractor performance 	Nil	<ul style="list-style-type: none"> Maintenance Delivery to facilitate Asset Management presentation to delivery partners on requirements and changes to Maintenance Plan following annual update. Maintenance Delivery to perform QA process on the inspection results and rectify any inaccuracy on the inspection results.

Audit scope	Identified non-compliances ³²	Actions
<ul style="list-style-type: none"> Data entry conformance 		
Inspection of Wood Pole Transmission Line Structures and Defect Management – Control Assurance Review <ul style="list-style-type: none"> Completion of inspections Management of defects 	Nil	<ul style="list-style-type: none"> Check that inspections results are loaded into AIM (Asset Inspection Manager system) before closing work orders Maintenance Delivery to clarify requirements with service providers for completing inspections and raising defects.
LiDAR inspection and associated defect management – Control assurance Review <ul style="list-style-type: none"> Review key processes from preparation for LiDAR inspection to validation of violations through inspections 	Nil	<ul style="list-style-type: none"> Develop a model to identify growth of vegetation from historical and current LiDAR data and intrusions. Design group to document and communicate core requirements (e.g., competency and qualifications) that must be satisfied by Delivery Partners. Recommended changes to the Maintenance Plan
Substation Issue and Defect Management - Control Assurance Review <ul style="list-style-type: none"> Completion and completeness of information provided for AIM issues and defect work orders. Site Inspections – Overall condition Site Inspections – HV Equipment Condition Site Inspection – Equipment fitment Site Inspection – Emergency Response 	Nil	<ul style="list-style-type: none"> Review and address work practices to ensure effective management of issues which require collaboration between multiple work groups to diagnose, scope and repair. Review and address work practices for use and completion of AIM Issue FMEA codes to ensure widespread use on all AIM Issues. Review and address work practices for routine and corrective work completion to ensure issues identified during site works are raised and reviewed in AIM. Review open property condition issues to consider effectiveness of process for monitoring or actioning of AIM issues against property assets which remain open and overdue. Review effectiveness of Maintenance Plan – Network Property inclusion of scope for inspection of external drainage infrastructure. Review project close out processes and determine process gaps in effective completion of asset fitment.

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

The table below lists external audits and associated actions and non-compliances which are relevant to the ENSMS.

Table 14: External audits performed on any aspect of the ENSMS

Audit scope	Identified non-compliances	Actions
2021 Asset Management Surveillance Audit	Nil	<ul style="list-style-type: none"> • 9 opportunities for improvement were also identified which initiated the following actions: <ul style="list-style-type: none"> - Review the Network Asset Strategy, identifying documented risks and opportunities. Consider how to best track these items, and whether CAMMS is the appropriate system. - Consider establishing a common risk register for the organisation including resource, competency, and training risks for projects. - Review a cross section of documents. Asset Management System (AMS) related documents checking document numbering, volumes exceeding review date, etc. - The criteria and process for managing minor maintenance changes to be reviewed. - Consider how to best track lessons learnt in the business including major projects, and whether CAMMS is the appropriate system. - Review bushfire related work order categorisation to determine if changes to the categorisation and assurance processes are required. - Check if the Digital Core project is improving the alignment of the Physical and Financial Asset Registers. - Review the approach and system to manage AMS related Continuous Improvement items - Review and update the risk assessment content in the AMS/ENSMS Audit Procedure.
IPART directed Bushfire Risk Management Audit. <ul style="list-style-type: none"> • Planning and preparation, implementation, measurement and evaluation, management review and change management of the bush fire risk management components Transgrid's ENSMS. Including whether bush fire preparedness can be observed in the field. • Compliance with licence condition 11 of its transmission licence, in particular the annual performance report. 	Nil	<ul style="list-style-type: none"> • 12 opportunities for improvement were identified which initiated the following actions: <ul style="list-style-type: none"> - The Bushfire FSA, and the Electricity Network Safety Management System Description document will be reviewed to determine the necessary changes to enable a more complete two-way engagement strategy for some external stakeholders.

Audit scope	Identified non-compliances	Actions
		<ul style="list-style-type: none"> - The Electricity Network Safety Management System Description document will be reviewed with necessary changes made to describe how dependencies between treatment options have been considered. - The Bushfire FSA will be updated to indicate that emerging technologies will be reviewed annually. - A project plan should be developed for the deployment of Pegasus for training and authorisation purposes. - To review whether Pegasus shall be used to help manage System Operator training and authorisation. - The Bushfire FSA, Bushfire Risk Management Plan, Asset Event Investigation and Reporting procedure and the Electricity Network Safety Management System Description document will be reviewed with necessary changes made to align the listed critical controls. - The Asset Management Change Procedure will be reviewed to determine the necessary changes in accordance with Clause 14(3) of the ESSNM Regulation. - To provide increased context around the information provided in the Annual ENSMS Performance Report by clearly stating where information provided relates to Transgrid's assets in the ACT. - To include additional contextual information into the Annual ENSMS Report beyond the basic regulatory requirements. - To update the Annual Performance Report Basis of Preparation document to include all data manipulations that are carried out.
<p>Utilities Technical Regulator directed Bushfire Risk Management Audit for assets in the ACT commenced during 2020/21. Report finalised in August 2021.</p> <ul style="list-style-type: none"> • Risk management associated particularly with the inspection and rectification of defects on overhead powerlines; • Management of vegetation around overhead powerlines; • Management of vegetation that may pose a bushfire risk by falling into overhead powerlines; 	<p>Nil</p>	<ul style="list-style-type: none"> • 5 opportunities for improvement were identified which initiated the following actions: <ul style="list-style-type: none"> - Review process followed to verify the work completion and assurance activities like DILO, site interactions, and desktop assessments. - To determine whether it is practical for LiDAR data to be used to determine the vegetation growth rates for individual trees. - To consider adding the likelihood of a hazard tree fail into the process of prioritising hazard tree management activities. - To update Transgrid documentation referencing that the Hazard Tree Register is now stored in Transgrid's spatial information system.

Audit scope	Identified non-compliances	Actions
<ul style="list-style-type: none"> Management of ACT regulatory obligations, with specific reference to the way in which they differ from those that apply in NSW. 		<ul style="list-style-type: none"> To consider documenting a fall-in hazards assessment guide.

Audits undertaken outside of the ACT and NSW, have not been included in the listing above.

3. Bushfire Preparedness Reporting for Summer 2022/23

Transgrid has reviewed advice from the Bureau of Meteorology (BOM), Australasian Fire and Emergency Service Authorities Council (AFAC) and the NSW Rural Fire Service (RFS) in preparation for this year's bushfire season. The consistent theme is that the 2022/23 spring season, like 2021/22, is expected to be wetter than average, leading to lower than average fire risk, although the recent year's good rainfall has promoted strong grass growth which may lead to a risk of grass fires should grass lands dry out through the summer months.

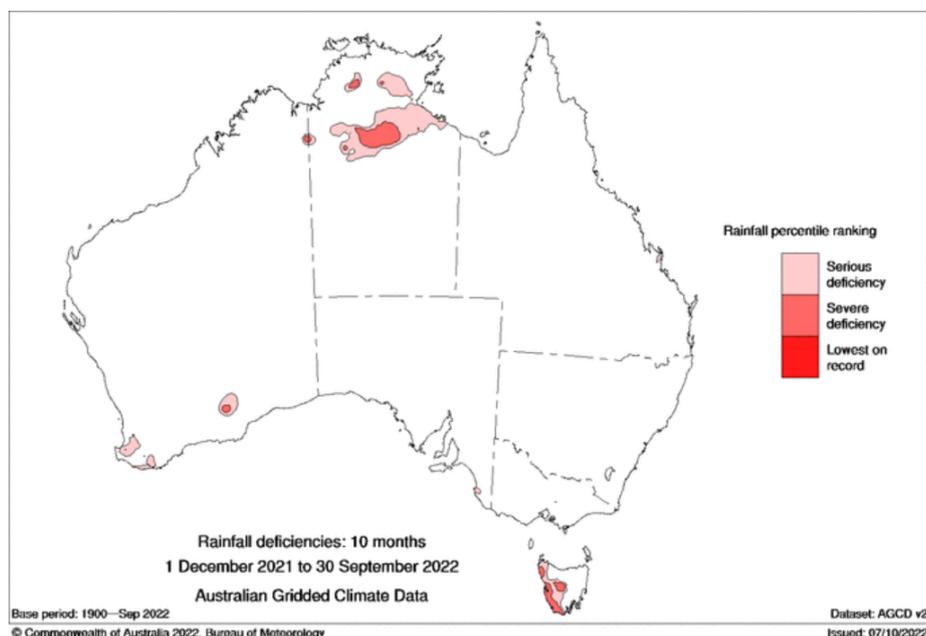
Transgrid is well placed for the upcoming bushfire season, with large volumes of inspection and defective tasks having been completed with only a small number of tasks outstanding at the time of report submission. Wet weather over the last 6 months has created many areas where ground is sodden resulting in access difficulty at various locations. This has created some delays in completing all pre-summer bushfire tasks. These outstanding tasks are being prioritised.

For further details please read the remainder of the report.

3.1. Bushfire risk profile across Transgrid's supply area

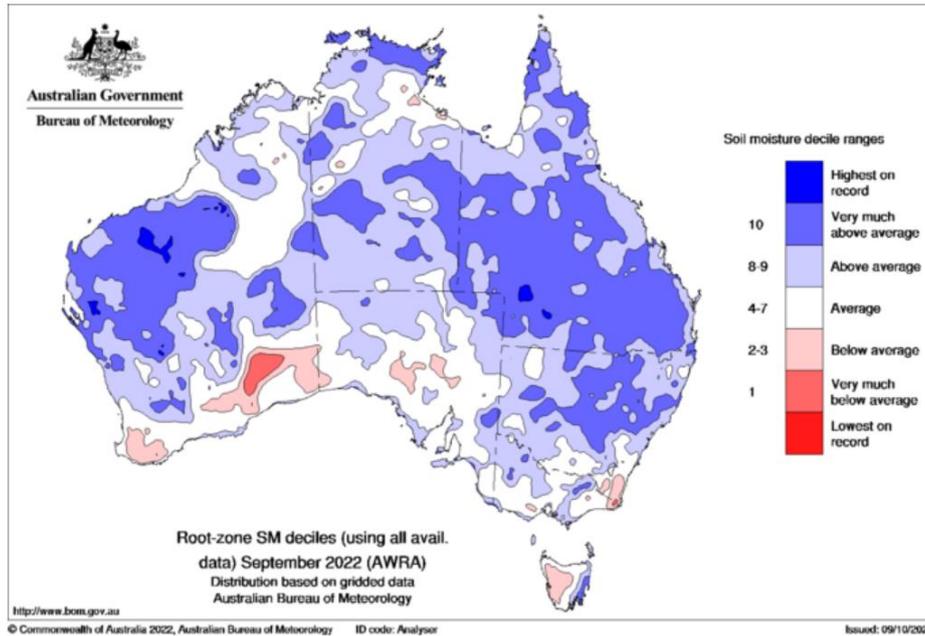
Climate factors relating to bush fire risk include temperature, humidity, wind, and the dryness of the landscape. These factors are reflected in Fire Danger Ratings and Total Fire Bans issued by the RFS. Indicators of the dryness of the landscape is monitored by the BOM with historical rainfall deficiencies and soil moisture measurements shown in Figure 1 and Figure 2.

Figure 1 Rainfall deficiency across Australia



Good rainfall over recent years has resulted in all NSW/ACT being out of drought conditions as shown in Figure 1. And a consequence, Root-zone soil moisture for September was above average across most of New South Wales/ACT as shown in Figure 2.

Figure 2: Root-zone soil moisture (soil moisture in the top 100 cm) for September 2022



The BOM also forecasts expected rainfall and maximum temperatures for the October to December period as shown in Figure 3 and Figure 4.

Figure 3: Chance of exceeding the median rainfall – November 2022 to January 2023

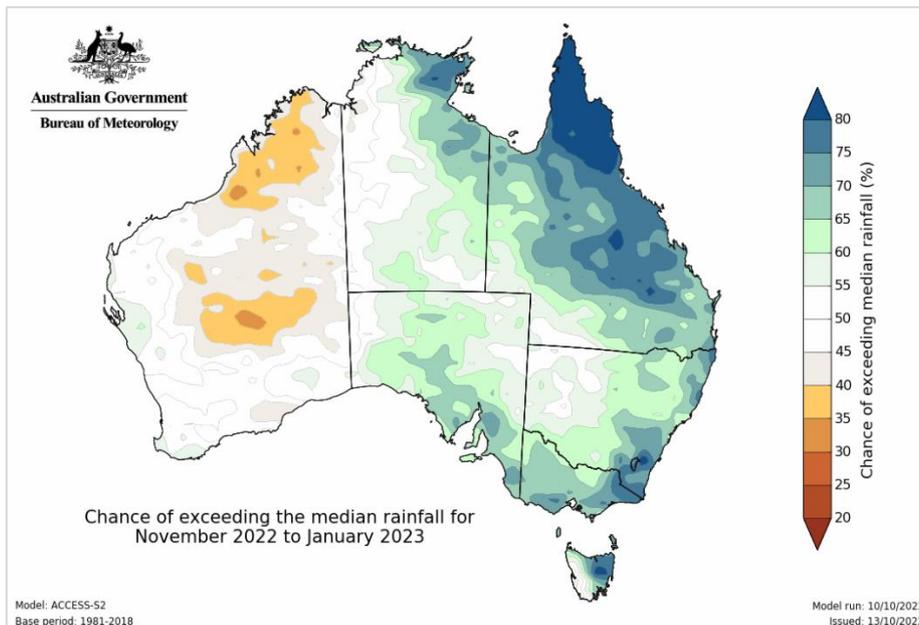
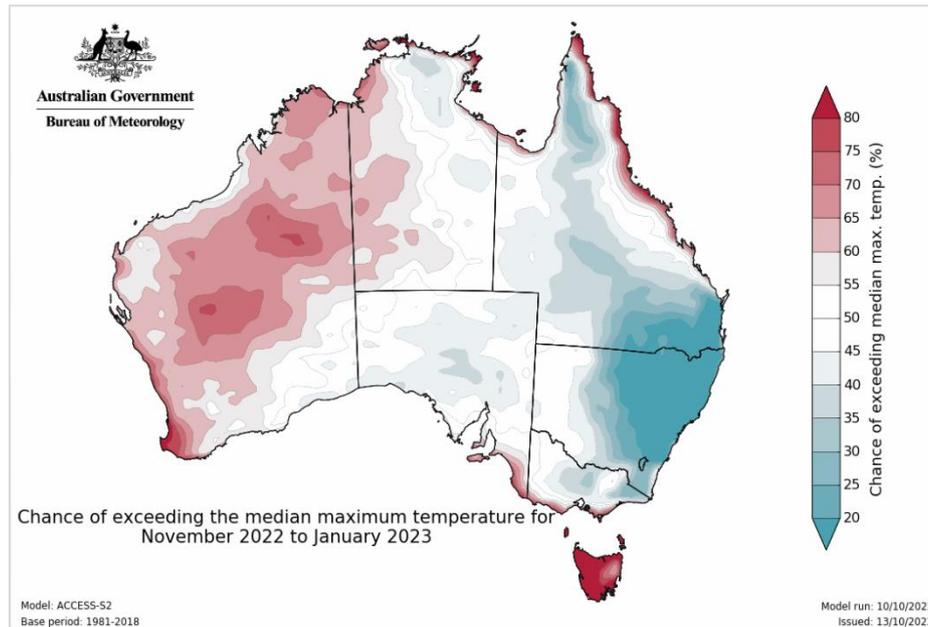


Figure 4: Chance of exceeding the median maximum temperature - November 2022 to January 2023

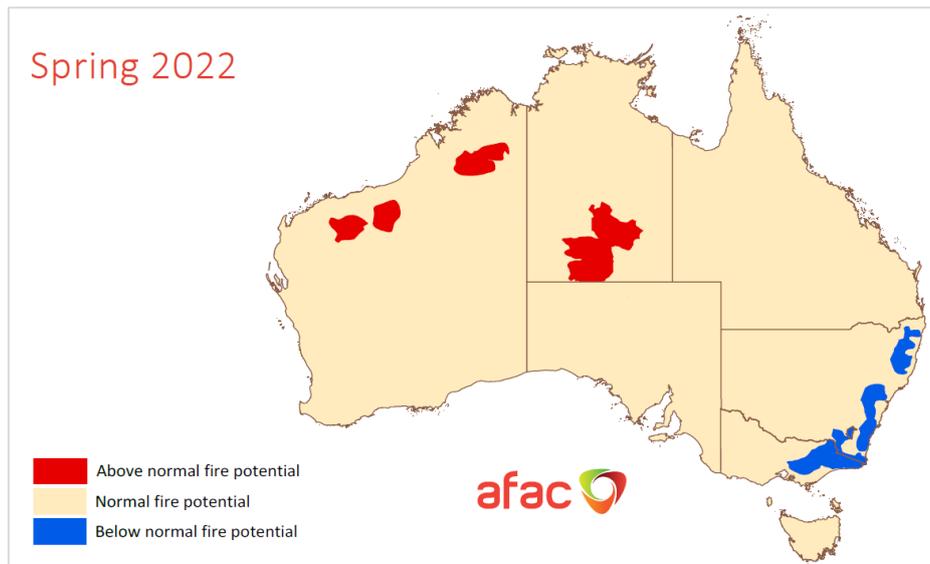


The BOM advised in October 2022:

- *November to January rainfall is likely to be above median for most of the eastern half of Australia, with the highest probabilities occurring in November.*
- *November to January maximum temperatures is likely to be cooler than median days for much of eastern New South Wales.*
- *La Niña, a negative Indian Ocean Dipole event, a positive phase of the Southern Annular Mode and warmer waters around Australia are all contributing to the wetter long-range forecast over large parts of Australia.*

As shown in Figure 5, the AFAC advised in late August that all of NSW and the ACT is expected to have normal or below normal fire potential this Spring.

Figure 5: Spring bushfire outlook



AFAC advised that:

NSW

“Persistent above average rainfall across much of NSW has resulted in unusually high fuel loads in grasslands and shrublands.

Given the high fuel loads, and despite the forecast of wetter than average conditions, there are likely to be periods of elevated fire danger in grassland and cropping areas, particularly in the northwest and southwest during the spring forecast period. It should also be noted that if the above median forecast rainfall does not eventuate, these high grass fuel loads will pose an above normal grass fire risk during the period.

In summary, NSW is expecting predominantly normal fire potential over the outlook period except for areas burnt in the 2019-20 season, though it is likely that the onset of the fire danger period in the north of the state will be delayed due to the wetter conditions.”

ACT

“Given the very wet start to August across the ACT and the outlook for above average rainfall throughout spring, below normal fire potential is expected for ACT during spring. Should the expected above average rainfall not be received, then we would expect to see normal fire potential for grasslands in the ACT during spring.

Fire agencies and land managers will continue to undertake prescribed burning when conditions allow throughout spring.”

The bushfire risk profile across NSW and ACT related to transmission line spans, substations and communication sites is represented in Figure 6 – figure 8.

Figure 6: Transmission Line Span Bushfire Risk Profile

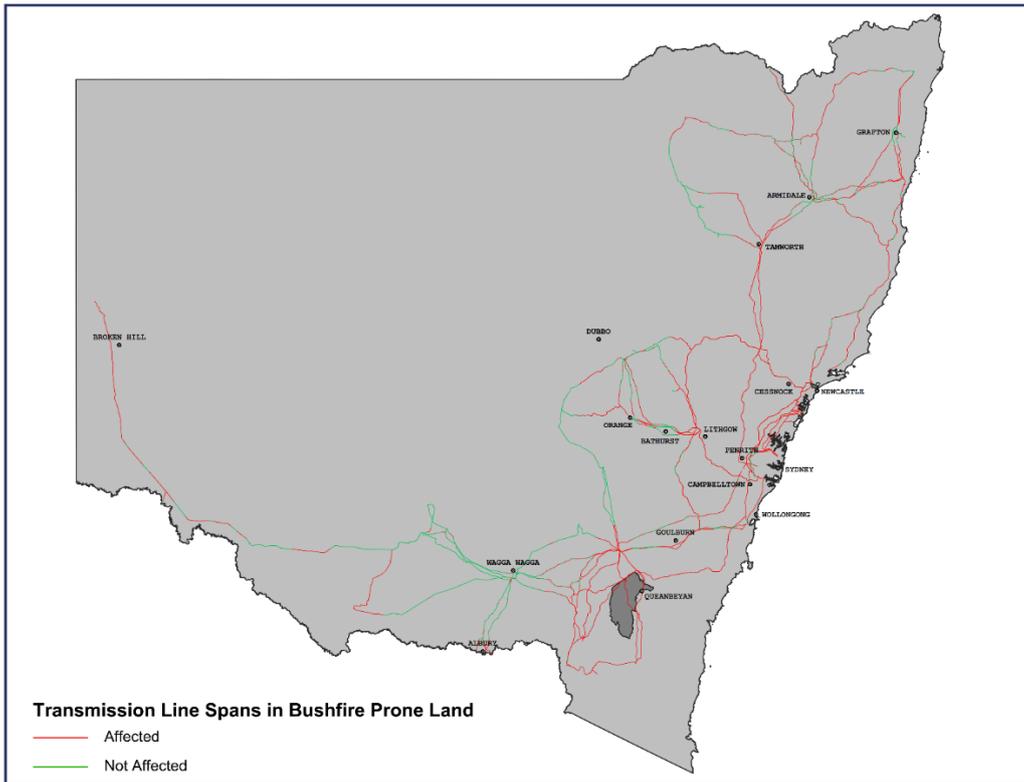


Figure 7: Substation Bushfire Risk Profile

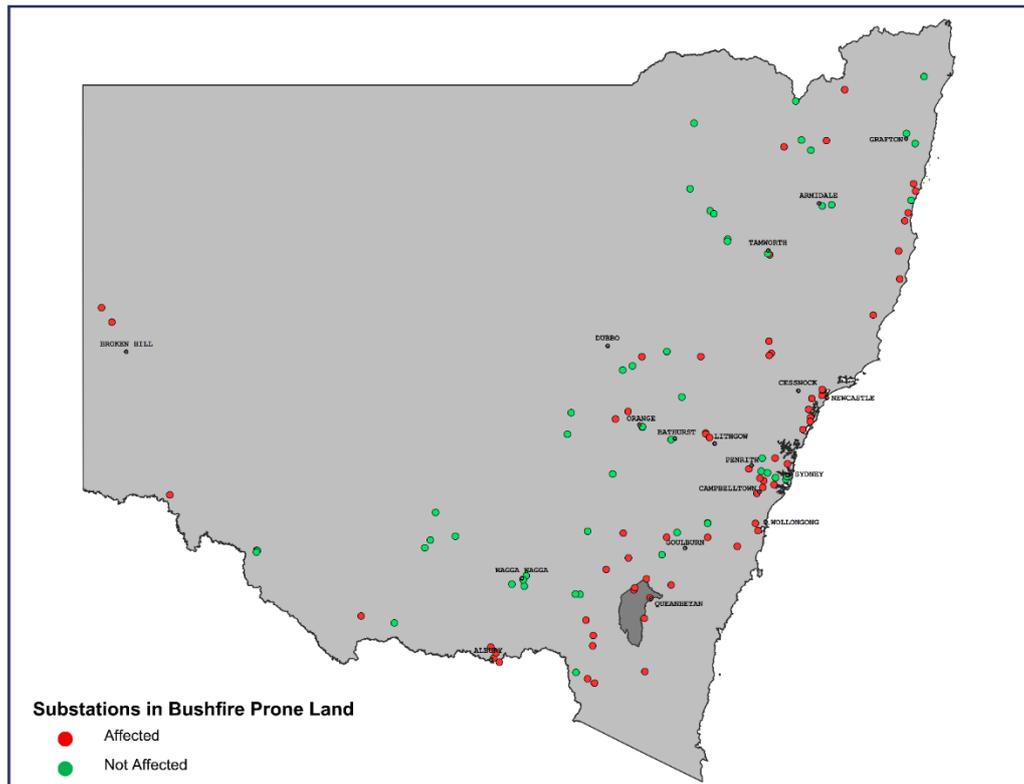
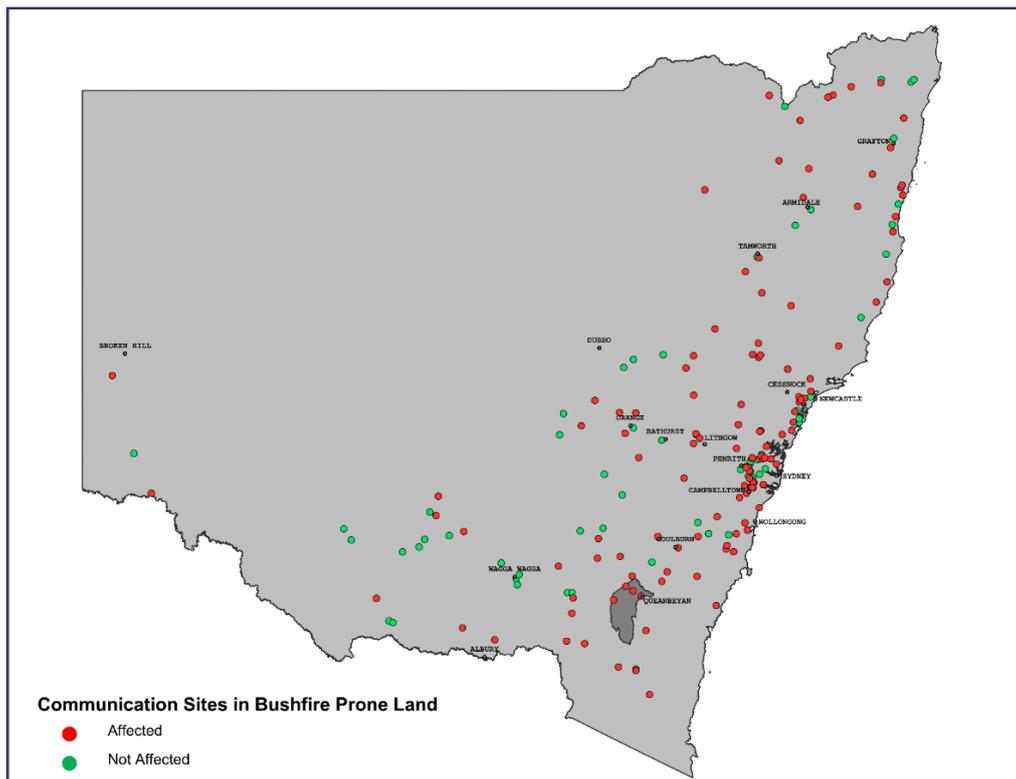


Figure 8: Communication Site Bushfire Risk Profile



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

The NSW RFS advised in September 2022:

"The upcoming bushfire season will be the first to incorporate the updated Fire Danger Rating System.

The existing six ratings are being replaced with four – Moderate, High, Extreme and Catastrophic. The new system of ratings was developed using community research and updated fire behaviour science, which until now, has remained unchanged for more than 50 years.

"Recent rain has led to good grass and crop growth across the state especially in western areas of NSW, and with more rain predicted over spring, this vegetation will continue to flourish.

"As warm weather sets in, this will dry out, increasing the risk of dangerous and fast moving grass fires.

"Despite the wet weather, we have already seen more than 1000 grass fires across the state since July, and the risk will increase in the months ahead.

Transgrid's Hot Work and Fire Risk Work procedure, Hot Work Permit and Fire Risk Assessment and Control Measures (FRACM) form were updated in September following the changes to the Fire Danger Rating System. Staff and contractors were advised of the change via email.

On 29 September, staff and contractors were advised that from 1 October, all areas of NSW and the ACT will be in the declared bushfire danger period. Workers were also reminded that when undertaking hot and

fire risk work, that they need to ensure they have considered the proposed work, the bushfire danger rating, and the daily weather forecast, in accordance with the Hot Work and Fire Risk Work procedure.

Transgrid will remain in close contact with the RFS (NSW and ACT) and Energy Utilities Functional Area Co-ordinator EUSFAC across the season.

3.3. Pre-summer bush fire inspections

The status of Transgrid’s pre-summer bushfire inspections is given in the tables below and includes all inspection tasks, raised, or completed during the 12-month period to 30 September 2022, where bushfire risk is being managed. At Transgrid, inspections are allocated as work orders. For Transmission lines and easement/vegetation inspections they generally include large numbers of spans on a single work order such as an entire feeder or hundreds of spans.

The most common pre-summer inspections include:

- Annual Light Detection and Ranging (LiDAR) inspection is the process of 3D laser scanning of ground, electricity infrastructure and vegetation, comparing the laser point data to PLS-CADD® transmission line models to determine the vegetation clearance to wire.
- Annual Compliance inspection is a ground inspection of the easement where scheduled LiDAR scan of the span did not or could not occur.
- Annual Aerial inspections undertaken from a helicopter to provide a high degree of assurance that the easements and transmission lines do not pose a bushfire or safety risk.
- 3-6 yearly Climbing inspections involve a close visual check of all transmission line and structure components. During a ground and climbing inspection of a wood pole structure, all wood poles associated with that structure shall be sounded throughout their length to determine any areas of rot or termite activity above ground. These inspections are not considered summer critical inspections.
- 6 monthly and Annual Substation inspections.
- Annual Substation switchyard thermographic inspections.

Table 15: Pre summer bushfire inspections

Pre-summer bushfire inspections	Population (spans / structures)	Target (No. of inspections)	Achieved (No. of inspections)	Outstanding (No. of inspections)	Comments
Inspections	37,847	1,628	1,454	174	For all asset classes including Easements

Comment on Table 15:

- Following the extraction of the relevant work orders and counts shown above, the Maintenance Delivery time has advised the following:
 - A further 110 inspections have been completed since the data was extracted at the end of the period.
 - 30 of the remaining inspections are associated with non-summer critical climbing inspections. 2 of these inspections are related to the ACT.
 - The remaining 34 are Compliance inspections, where access to many areas has been restricted by wet ground and bushfire risk is low due to prevailing cool weather and above average rainfall. It is estimated that for these work orders, greater than 90% of all spans and

transmission structures have been inspected. Work is planned to finalise these inspections during October - November subject to ground access conditions. 1 of these inspections is related to the ACT.

3.4. Vegetation Tasks

The following table provides a count of identified vegetation encroachments and numbers of Hazard trees associated with managing bushfire risks near Transgrid’s Transmission Lines, raised, or completed during the 12-month period to 30 September 2022. At Transgrid, vegetation tasks are allocated as work orders.

Transgrid’s vegetation management practice is to identify vegetation encroachment into the minimum vegetation clearance (total sum of the expected growth rate of the vegetation and the minimum safe working distance). Any encroachment within this envelope is treated as a Planner Priority 01 and only these tasks are listed in the table below. Transgrid’s highest priority.

Transgrid also carried out an additional 1,468 vegetation tasks (non - Priority 01 work orders) to those listed below to manage bushfire risk over the period. Transgrid proactively keeps vegetation outside the minimum safe approach distance, demonstrated by the low number of Planner Priority 01 tasks.

Table 16: Vegetation tasks

Bushfire risk category	Status	Encroachment Classification A1 ³³	Encroachment Classification A2 ³⁴	Encroachment Classification A3 ³⁵	Encroachment Classification A4 ³⁶	Hazard trees ³⁷
Bushfire Prone	Identified	0	0	0	0	79
	Completed	0	0	0	0	36
	Open	0	0	0	0	43
	Outstanding	0	0	0	0	0
Non-Bushfire Prone	Identified	0	0	3	0	3
	Completed	0	0	3	0	1
	Open	0	0	0	0	2
	Outstanding	0	0	0	0	0

³³ A1 – vegetation has encroached as far as 75-100% into the minimum vegetation clearance.

³⁴ A2 – vegetation has encroached as far as 50-75% into the minimum vegetation clearance.

³⁵ A3 – vegetation has encroached as far as 25-50% into the minimum vegetation clearance.

³⁶ A4 – vegetation has encroached as far as 0-25% into the minimum vegetation clearance.

³⁷ Hazard trees are blow-in/fall-in vegetation hazards as defined in ISSC3 Guide for the Management of Vegetation in the Vicinity of Electricity Assets.

Comment on Table 16:

- No tasks are outstanding.

ISSC3 Guide for the Management of Vegetation in the Vicinity of Electricity Assets specifically excludes transmission network service providers. Consequently, the definition of hazard trees in this guideline does not apply to Transgrid. Transgrid’s definition of hazard trees is:

- A tree with the potential to impact or come within electrical clearances of the transmission line or its structures should whole or parts of the tree fall. In many cases, hazard trees are outside the easement. Also known as Danger Tree. The potential to impact is calculated at Maximum Line Operating Conditions (Tmax only).

Transgrid’s definition of a hazard tree aligns with the definition of hazard tree provided in ISSC3.

3.5. Asset Tasks

The following table provides combined counts of both Defect and Condition based tasks associated with managing bushfire risks, raised, or completed during the 12-month period to 30 September 2022, split into Substations, Transmission Lines, Automation (includes protection, communication, controls, and metering type asset classes) and Network Property (property – substations and property – repeater site type asset classes). At Transgrid, maintenance tasks are allocated as work orders.

- The most common asset tasks in the table below include pole assessment or treatment, condemned pole replacement, transmission line bolt/nut/fitting, insulator, bond, guy wire and overhead earth wire repairs, and for substations, circuit breaker and hot joint repairs.

Table 17: Asset tasks (Defects and Condition Based Maintenance)

Asset Category	Status	Within bushfire prone areas						Outside bushfire prone areas					
		Work order priority					Totals	Work order priority					Totals
		1	2	3+3A	4	5 ³⁸		1	2	3+3A	4	5	
		< 24 hours	< 1 month	< 6 months	< 12 months	Next outage / Maintenance / Manually set		< 24 hours	< 1 month	< 6 months	< 12 months	Next outage / Maintenance / Manually set	
Substation	Identified	15	23	23	8	10	79	9	11	9	19	6	54
	Completed	15	23	12	4	1	55	9	11	3	18	3	44
	Open	0	0	10	4	3	17	0	0	6	1	3	10

³⁸ Includes work orders where priority has been manually set by an authorised person

Asset Category	Status	Within bushfire prone areas						Outside bushfire prone areas					
		Work order priority					Totals	Work order priority					Totals
		1	2	3+3A	4	5 ³⁸		1	2	3+3A	4	5	
		< 24 hours	< 1 month	< 6 months	< 12 months	Next outage / Maintenance / Manually set		< 24 hours	< 1 month	< 6 months	< 12 months	Next outage / Maintenance / Manually set	
	Outstanding	0	0	1	0	6	7	0	0	0	0	0	0
Transmission Line	Identified	1	30	111	351	144	637	3	78	138	348	94	661
	Completed	1	30	69	150	50	300	3	75	93	140	51	362
	Open	0	0	40	194	91	325	0	3	42	206	41	292
	Outstanding	0	0	2	7	3	12	0	0	3	2	2	7
Automation	Identified	2	5	0	0	1	8	0	0	0	0	0	0
	Completed	2	4	0	0	0	6	0	0	0	0	0	0
	Open	0	1	0	0	1	2	0	0	0	0	0	0
	Outstanding	0	0	0	0	0	0	0	0	0	0	0	0
Network Property	Identified	8	5	69	64	0	146	0	0	0	0	0	0
	Completed	8	3	53	51	0	115	0	0	0	0	0	0
	Open	0	2	16	13	0	31	0	0	0	0	0	0
	Outstanding	0	0	0	0	0	0	0	0	0	0	0	0

Commentary on Table 17:

Open and overdue unplanned Bushfire Work Orders are scheduled in a prioritised manner to ensure high bushfire risk work is completed first. Bushfire maintenance reports are issued each week as per Transgrid's Bushfire Risk Management Plan.

For the outstanding work orders on 1 October 2022:

- Transmission Lines – 19 tasks mostly associated with conductor repairs, bent tower members and pole replacements.
 - Various Work Orders have been delayed due to wet weather and access issues.
 - 7 are planned to be repaired by end November subject to ground conditions.
 - 2 are scheduled to be implemented with other projects on the affected lines.
 - 10 work orders are to be reassessed in accordance with Transgrid's Maintenance Program - Variation Process.

- Substations – 7 tasks were identified
 - The Maintenance Delivery team has subsequently advised that 6 are low priority tasks, associated with insulator standards and are not associated with bushfire risk (asset system update required to update risk)
 - The remaining task is associated with busbar hot joint, which is planned to occur during October.
- In the ACT, no work orders were outstanding on 1 October 2022.

Transgrid's Work Order Planner Priority timeframe is as follows:

- P1 – 24 hours
- P2 – 1 month
- P3 – 3 months
- P3A – 6 months
- P4 – 12 months
- P5 – Next outage or maintenance
- RZ – Manually required by date, where date is set by an authorised person.

4. Glossary

Term	Description
Assisted failure	Any functional failure of a piece of equipment (component of an asset or asset) where the equipment was subject to an external force or energy source against which the network operator's standards for design and maintenance do not attempt to control.
Fire	<p>A state, process, or instance of combustion in which fuel or other material is ignited and combined with oxygen, giving off light, heat and flame. This includes 'smouldering' or 'smoke' events.</p> <p>Network Scope: Applicable to any fire caused by, or impacting, a network asset.</p>
Functional failure	Transgrid interprets a network asset functional failure to be the incident when the particular network asset types were unable to meet the expected or specified performance standard in the reporting period, thereby causing an outage or incident.
Incident	Defined in accordance with IPART's <i>Electricity networks reporting manual - Incident reporting</i> , available on the IPART website.
Major incident	Defined in accordance with IPART's <i>Electricity networks reporting manual - Incident reporting</i> , available on the IPART website.
Network worker	A person who has been authorised by the network operator to plan or conduct work on or near the network. Includes persons employed by the network, persons engaged under a contract by the network operator, and persons authorised by the network operator and working for an Accredited Service Provider.
Open (with respect to defects / tasks)	A defect / task that has not been rectified by the network operator but where the time that has elapsed since being identified has not exceeded the standard time that the network operator has set for having the defect rectified.
Outstanding (with respect to defects / tasks)	A defect / task that has not been rectified by the network operator where the time that has elapsed since being identified has exceeded the standard time that the network operator has set for having the defect rectified.
Public worker	A party or parties that are conducting work that is not directly associated with the electricity network such as building work, landscaping, landfill work, excavations, road works and includes the construction, maintenance, adjustment or dismantling of mobile plant and scaffolding.
Unassisted failure	Any functional failure of a piece of equipment (component of an asset or asset) where the cause of the failure is of a type for which the network operator's design and maintenance standards include specific controls to mitigate against the risk of failure and which is neither an assisted failure nor a maintenance induced failure. These failures are generally caused by a deterioration of the condition of the equipment and also include overhead connection failures and vegetation within the mandatory vegetation clearance window.