

Annual Safety Performance and Bushfire Preparedness Report

2022/23

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 2022 to 30 June 2023 in line with Reporting Manual Appendix A.

Section 3 of this report covers Bushfire Preparedness for the period from 1 October 2022 to 30 September 2023 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 2022/23

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 A.1).

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		No incidents to report.
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		One 0.25 system minute incident in July 2022 where Transgrid 220KV Buses at Buronga, Broken Hill and Balranald substation tripped. Initial investigation indicate Trnasgrid's Line X3 disconnector X31 at Buronga failed.

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	One significant near miss at Line 99J where property owner's equipment came in contact with the line (SAD breach). No injury sustained.
Safety of persons working on network	No incidents to report.
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	14,025	0.6	0	0	0	0	0	0
Poles (including stay poles) ⁵	23,084	2.6	0	0	0	1	0	0
Conductor – Transmission OH ⁶ (km)	11,123	25.8	0	0	0	1	1	0
Conductor – Transmission UG ⁷ (km)	115.1	0.2	1	0	0	0	0	0
Power transformers ⁸	215	5.4	4	1	0	0	0	0
Reactive plant ⁹	177	13.4	12	0	0	2	0	0
Switchgear – transmission	15,126	18.4	20	0	0	1	0	0
Protection relays or systems	3,536	8.8	7	0	0	1	0	0
Transmission substation SCADA system	2,168	7.2	7	0	0	0	0	0
Transmission substation Protection Batteries ¹⁰	276	16	4	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 2022/23. 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.
- The other functional failures in 2022/23 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 2022/23 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	1	0	0	0	0	Tree fell on TL 944 which started a contained fire. No surrounding property was damaged due to this fire.
Interruption ¹² – grow in	0	0	0	0	1	
Interruption – fall-in and blow in	2	2	1	2	1	A tree was found on ground with no damage to the TL. Tripped two transmission lines (9C5 & 9C6) sharing the same structure. The fire start incident mentioned above is also included in this count.

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 2022/23 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	0	
Public worker	0	0	0	0	0	
Network employee / network contractor ¹⁶	0	1	2	0	0	
Livestock or domestic pet	0	0	0	0	0	
Contact with energised overhead network asset (e.g. conductor strike)						
Public road vehicle ¹⁷	0	0	0	0	0	
Plant and equipment ¹⁸	0	1	1	0	0	
Agricultural and other ¹⁹	0	0	0	0	0	
Network vehicle	0	0	0	0	0	
Contact with energised underground network asset (e.g. conductor strike)						
Plant and equipment	1	0	0	0	0	Comment from 22/23: A near miss incident where Third Party's unnotified excavation work in vicinity of line 42. No electric shock or injury reported.

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.

Detail	Event count					Comments on 2022/23 events
	Current reporting period	Last reporting period	Two periods ago	Three periods ago	Four periods ago	
Person with hand held tool	0	0	0	0	0	
Unauthorised network access (intentional)						
Transmission substation / switching station	5	5	5	1	3	5 unauthorised access events occurred at 3 different transmission substations
Tower / poles	0	0	1	2	0	
Other (e.g. communication sites)	1	0	1	0	0	1 unauthorised access event at a repeater station
Safe Approach Distance (SAD)²⁰						
Network employee / network contractor	0	1	1	0	0	
Public	1	0	0	0	0	Same incident at Line 99J, see above.
Public Worker	0	0	0	0	0	

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
Buronga, Broken Hill and Balranald 220 kV Buses	220	Plant Failure	Nil
Deniliquin 66 kV No.2 Bus	31	Preventable	Nil
Armidale 66 kV Bus Section 3	10	Preventable	Nil
Deniliquin 66 kV Bus Section 1	129	External	Nil
96C Coffs Harbour - Armidale - Dorrigo 132kV Line	11	External	Nil

Commentary on Table 6:

- There were further 7 loss of supply events in 2022/23 meeting one or more exclusion criteria set out by the AER in STPIS.
- No quality of supply incidents occurred during the 2022/23 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 2022.

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	0	7	0	0	
Network property (including non-electrical assets including vehicles, buildings)						
Damage (e.g. Fire, Physical impact or Electrical)	1	0	1	2	2	1 x Transformer failure and fire ignition at Marulan 330kV Substation

The following events are excluded from the counts above (from 2022/23 onward):

- 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 2022/23. This FSA is currently under review.
Worker Safety	No changes occurred during 2022/23. This FSA is currently under review.
Bushfire	No changes occurred during 2022/23. This FSA is currently under review.
Environment and Property	<p>The FSA was approved in January 2023, and included the following changes:</p> <ul style="list-style-type: none"> • An update of environmental aspects to reflect the 2022 register of environmental aspects inclusion of high potential incident review and historical performance, • An update to include the review of new and emerging technologies • Revised bow-ties for significant environmental aspects, and updated controls to reflect current practices
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	279	225	277	497	381
Designs for which Safety in Design (SiD) Reports have been audited	279	225	277	497	381
Safety reviews performed ²⁴	420	698	262	98	NA
Project closeout reports completed	142	143	172	60	45
Project closeout reports audited	1	0	0	0	0

Commentary on Table 9:

- 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 2022/23, 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	629	629	0	0	8	8	0	0	Refer comments below
Transmission OH	824	824	0	0	13	13	0	0	
Transmission UG	162	162	0	0	0	0	0	0	

Commentary on Table 10:

- Pre-summer bushfire activities counted in Tables 15 and 17 have been excluded from this table.
- Transgrid does not own any distribution assets, and so activities related to zone substations, distribution substations, distribution mains or network SAPS are not applicable.

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.

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. 54 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	302	302	0	<ul style="list-style-type: none"> All LiDAR Inspections All inspections occurred before 1/10/2022, so not duplicated in Table 15.
Ground-based					
Total	37,847	139	139	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 1/10/2023 so not duplicated in Table 15.

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

2.13. Public electrical safety plans and activities

Transgrid continued to implement its Public Electricity Safety Awareness Plan (PESAP) during 2022/23. 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

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

- 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 Plan	The Plan is under review.
Look Up and Live Social Media Campaign	<p>Transgrid proactive engagement with landowners to educate them on the risks associated with working around transmission lines and an opportunity to share and develop risk management strategies to avoid incidents in the future. Direct marketing and post in Youtube (Transgrid Radio), Facebook, LinkedIn and Instagram throughout 2023.</p> <p>Landowners received posters and stickers with practical information about what to do in an emergency and knowing their machinery heights</p> <p>The internal promotion of this campaign is through TheWire publication and HSE toolbox talk in Feb 2023.</p>

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.

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.

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

Audit scope	Identified non-compliances ³²	Actions
Vegetation Management Competence - Target Area Review	Nil	<ul style="list-style-type: none"> - Update the FSA to separate the assessment of grow-in and fall-in hazards, these are managed by separate processes and should be assessed individually as to whether the threat is controlled ALARP in accordance with AS5577. - Ensure that all core processes and procedures are stored in accordance with the relevant document management procedures and include the required document control information within the document. - It is recommended that Delivery ensure that they have records of performance of audits related to the ENSMS to ensure compliance with clauses 4.5.3(c) and 4.5.4 of AS5577 and Table A.4 of the IPART audit criteria.
Asset Management Organisational Change - Target Area Review	Nil	<ul style="list-style-type: none"> - Operating Model is updated to describe the accountabilities and responsibilities of the current organisational structure as required by Clause 5.3 of ISO5501 - To update to the Transgrid Capability Framework be communicated to the stakeholder noting it is required as a component of change management and compliance to Clause 5.3 and Clause 7.2 of ISO55001
Control Assurance Review Report - RMS and Asset Acceptance	Nil	<ul style="list-style-type: none"> - Establish guideline documentation must be created to ensure project managers are aware how to provide HV test data, as listen in Asset Acceptance Checklist. - Quality control and review process must be established for Asset Acceptance Checklists Safety notice to be distributed to site managers highlighting importance of pre-energisation checklist. Delivery to provide report tracking compliance by comparing asset in-service dates with pre-energisation checklist completion dates. Report to be provided on a quarterly basis to Asset Management and Network Operations.
Control Assurance Review Report - Transformer Routine Maintenance	Nil	Identify and implement a method for recording maintenance steps to ensure they are recorded and auditable.
Easement Inspection and Condition Based Maintenance	Nil	<ul style="list-style-type: none"> - Review the determination of Vegetation Clearance Requirement for condition based maintenance scoping - Process improvement for Maintenance to record work order information such as differences from Maintenance Plan and plan and schedule dates. - Communicate to Staff in Maintenance Engineering regarding Variance process
Asset Management Second Line Assurance Review	Nil	<ul style="list-style-type: none"> - Update the AMS and ENSMS Audit Procedure to: <ul style="list-style-type: none"> > Ensure the audit framework is in alignment with the current Second Line governance structure and audit requirements. > Clarify what types of material changes need to be submitted to the Asset Management Committee and how these changes will be communicated > Provide better guidance on how and where to record audit findings, the operation of CAMMS and the responsibilities for signing off audit actions

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"> > Reference the corporate document classification and record management requirements (as outlined in the Document and Records Management Procedure) - Update the Asset Management Committees – Strategy and Plan in alignment with new organisational restructure, committee structure and membership - Update the Asset Management Committees – Strategy and Plan in alignment with new organisational restructure, committee structure and membership - Update the Control Assurance Review Procedure to: <ul style="list-style-type: none"> > Ensure the audit framework in alignment with the current Second Line governance structure and audit requirements > Provide better guidance on how and where to record audit findings, the operation of CAMMS and the responsibilities for signing off audit actions > Remove the references to “all parts of the Network”. Provide more practical scope for audit coverage over the 3-year audit cycle and simplify the Control Assurance Review Tables outlined in the Appendix B > Define the CAR Program Co-Ordinator role > Clarify what records need to be kept and where they need to be stored > Add a check sheet to support consistency and compliance in completing a Control Assurance Review > Develop an annual audit program targeting CAR process assurance - Update the templates used for Health Checks and Control Assurance Review Reports in alignment with the procedure requirements.
Cable 46 (PSF) and 39 Asset Acceptance and Maintenance	Nil	<ul style="list-style-type: none"> - Implement MST's for Cable Condition Based Maintenance as per AMI TLC2022-005
Transmission Lines Capital Project Review	Nil	<ul style="list-style-type: none"> - To include the related construction managers in the project planning stage, making sure the captured lesson learnt can be applied in new projects - Network Delivery Review Committee to monitor project closeout report status of various completed projects and report during routine meetings. Outstanding project list to be provided to Asset Management for reference. - Arrange a communication/training session for the project teams to understand this requirement. - Include the project scope checklist into the Asset Acceptance.

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
2022 ISO 55001 Surveillance Audit	Nil	<ul style="list-style-type: none"> - In the next review cycle, references to Corporate Strategy and Asset Management Policy should be updated in the NAS to maintain consistency across documents. - In the next review cycle, the NAS should be updated to reflect the current state of the Digital Core Project. - A review and update of the Asset Management System Description to address this would support delivery of required communication as intended. - The Asset Information Strategy would be improved by reflecting the current list and status of initiatives.

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

3. Bushfire Preparedness Reporting for Summer 2023/24

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 2023/24 spring season, like 2022/23, 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.

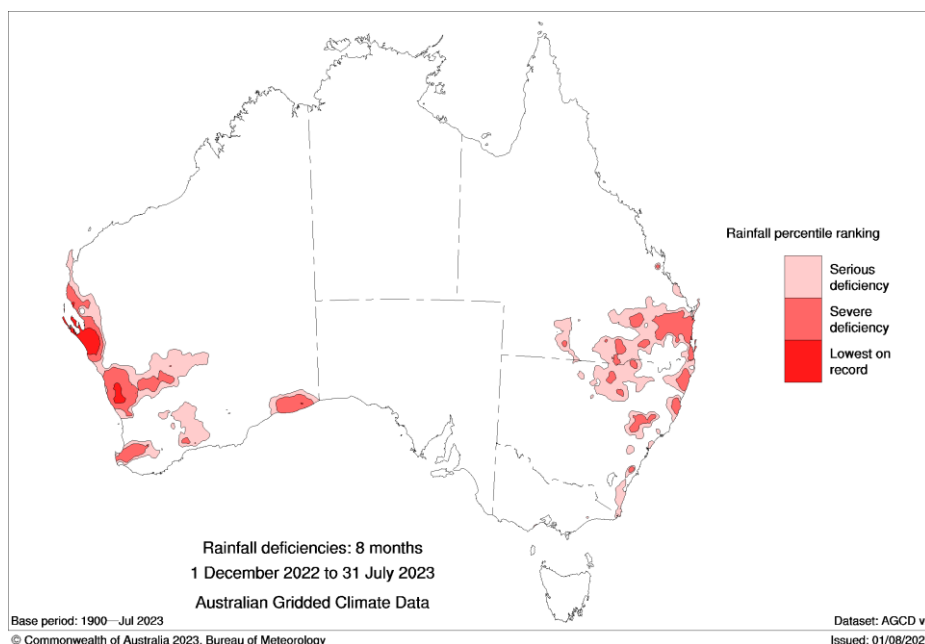
Transgrid is well placed for the upcoming bushfire season, with large volumes of inspection and defective tasks having been completed with only a small number of tasks outstanding at the time of report submission. Wet weather over the last 6 months has created many areas where ground is sodden resulting 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

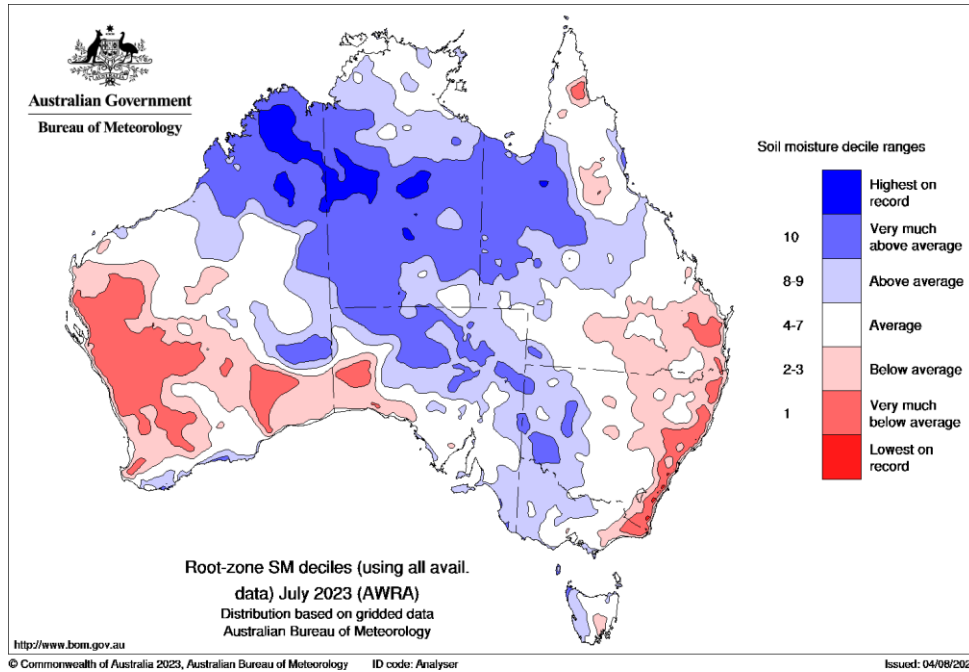
Climate factors relating to bush fire risk include temperature, humidity, wind, and the dryness of the landscape. These factors are reflected in Fire Danger Ratings and Total Fire Bans issued by the RFS. Indicators of the dryness of the landscape is monitored by the BOM with historical rainfall deficiencies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

Figure 1 Rainfall deficiency across Australia. Source: [BOM](#)



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) Source: [BOM](#)



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 – October 2023 to December 2023. Source: [BOM](#)

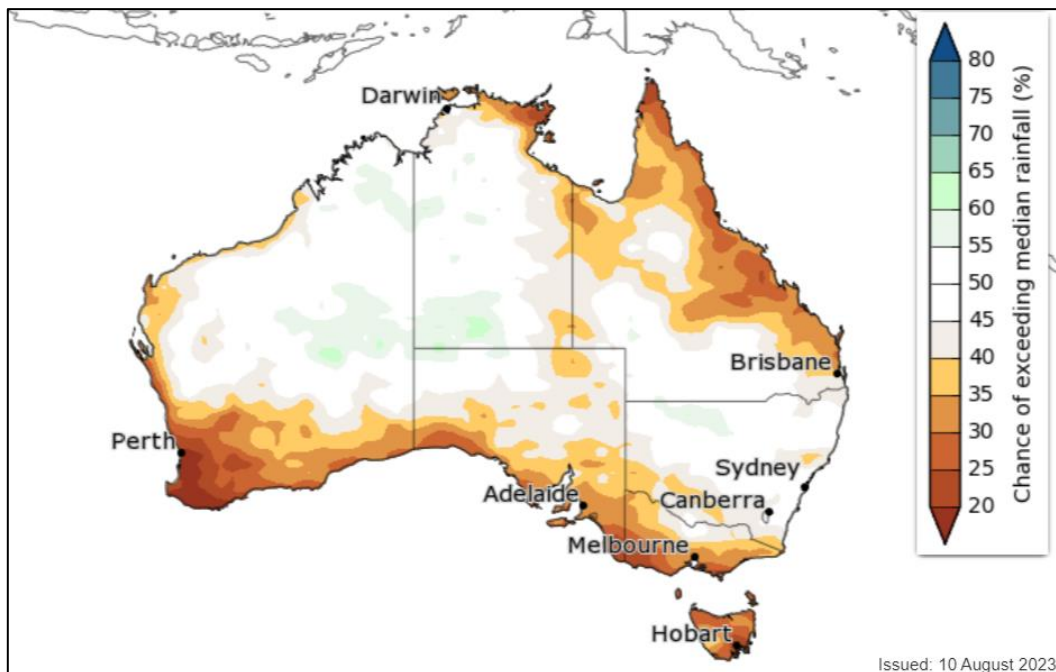
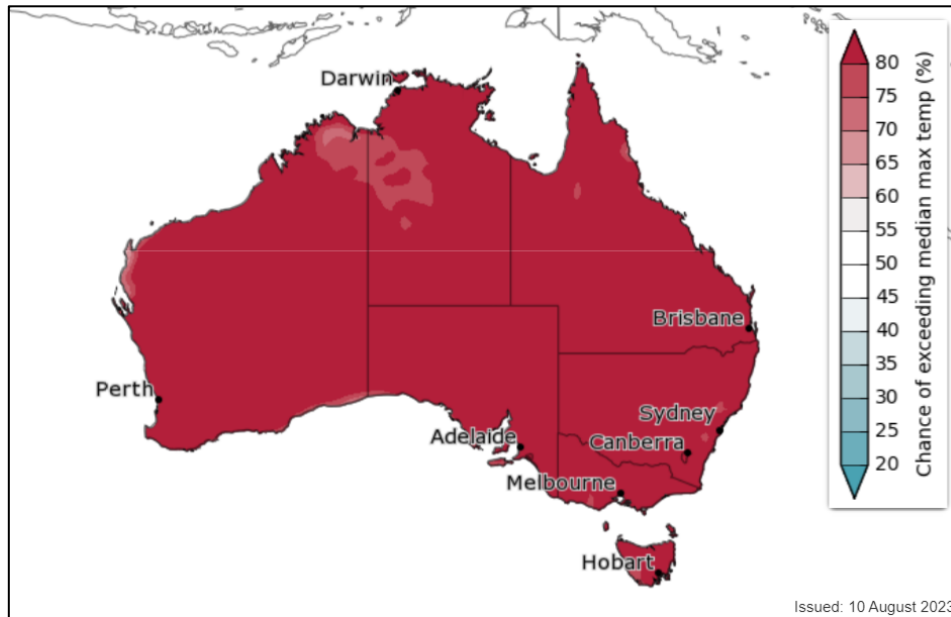


Figure 4: Chance of exceeding the median maximum temperature - October 2023 to December 2023. Source: [BOM](#)

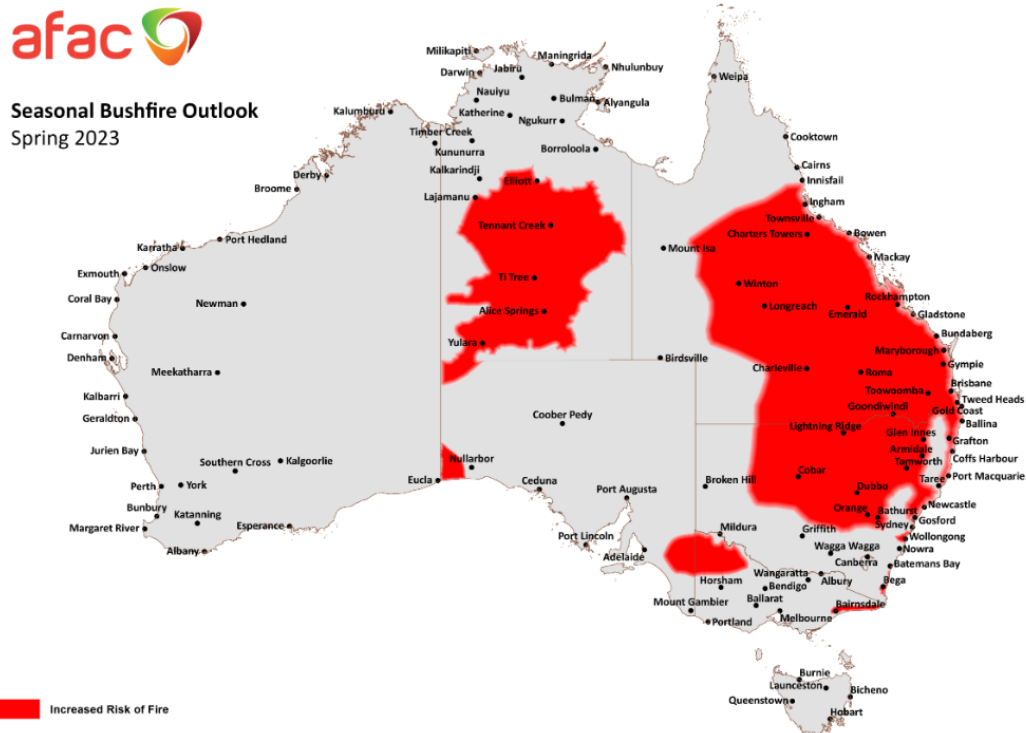


The [BOM](#) advised in October 2023:

- *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

“Increased risk of fire is the likelihood of an increased number of significant bushfires occurring in the outlook period compared to average.”

Many regions have also seen increased fuel growth due to above average rainfall throughout recent La Niña years, which is contributing to increased risk of bushfire across locations in Australia during the spring 2023.

In summary, Increased risk of fire is expected for regions in Queensland, NSW, Victoria, SA and NT. Communities in these regions are urged to prepare for bushfire and monitor local conditions .”

ACT

“After experiencing three very wet years, the ACT is now facing drier conditions, although catchments still hold a significant amount of water. Considering the current landscape and water availability, there is a normal risk of bushfires in the ACT this spring.

Normal bushfire risk during spring expected for the ACT .”

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

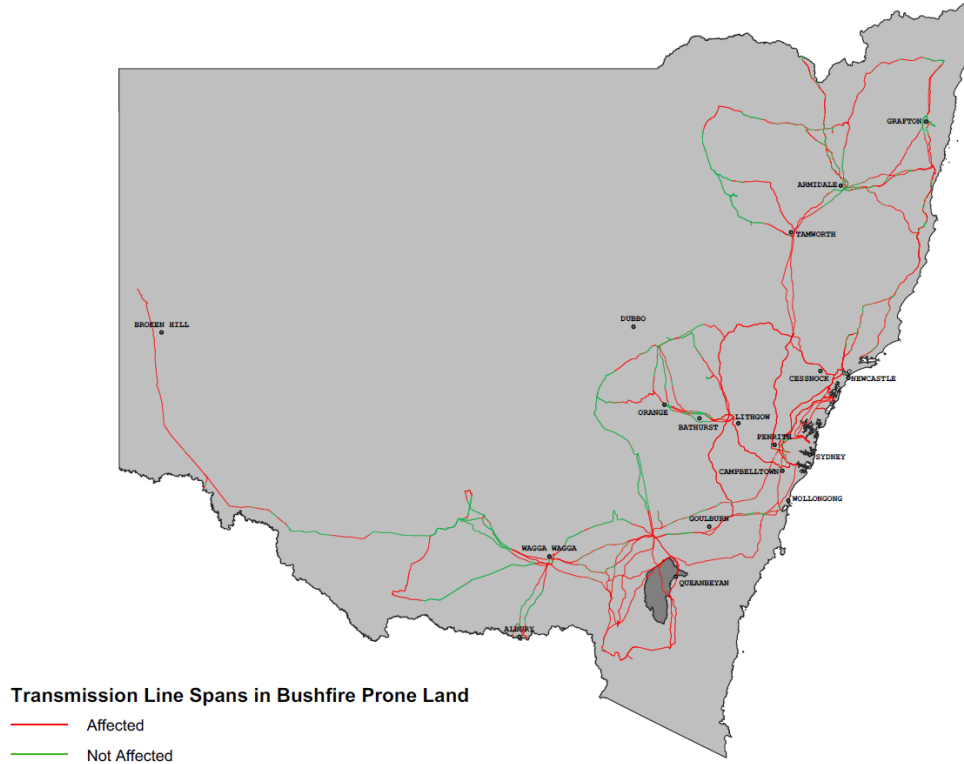


Figure 7: Substation Bushfire Risk Profile

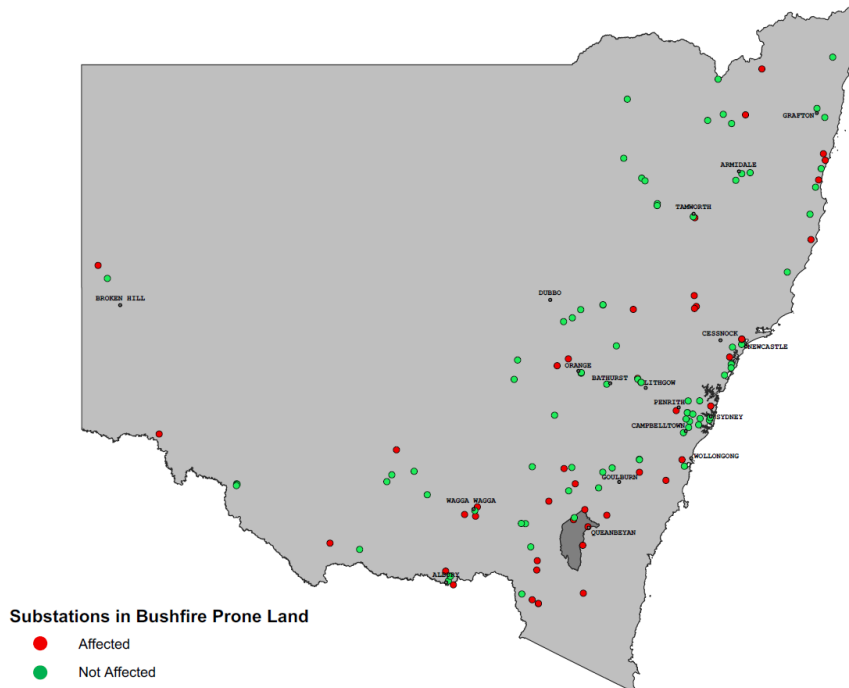
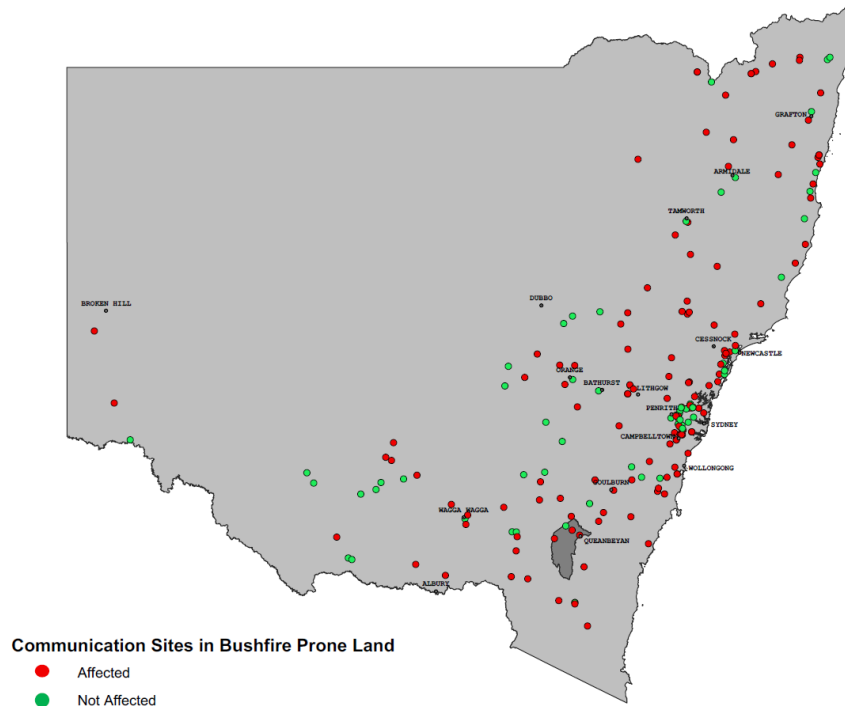


Figure 8: Communication Site Bushfire Risk Profile



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

The NSW RFS overview of Seasonal Bushfire Outlook in August 2023:

“Australia’s climate influences have shifted significantly since last spring, with above average temperatures and below average rainfall expected for almost the entire country for the coming season”.

Many regions have also seen increased fuel growth due to above average rainfall throughout recent La Niña years, which is contributing to increased risk of bushfire across locations in Australia during the spring 2023.

Increased risk of fire is expected for regions in Queensland, NSW Victoria, SA and NT. Communities in these regions are urged to prepare for bushfire and monitor local conditions. “

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	518	518	0	For all asset classes including Easements

Comment on Table 15:

Nil.

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	59
	Completed	0	0	0	0	59
	Open	0	0	0	0	0
	Outstanding	0	0	0	0	0
Non-Bushfire Prone	Identified	0	0	0	0	0
	Completed	0	0	0	0	0
	Open	0	0	0	0	0
	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.
- Hazard tree count has decreased overall as compared to last year.

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					Totals	Outside bushfire prone areas					Totals
		Work order priority						Work order priority					
		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	12	40	44	5	10	110	21	23	31	1	14	90
	Completed	12	40	44	5	10	110	21	23	31	1	14	90

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	
	Open	0	0	0	0	0	0	0	0	0	0	0	0
	Outstanding	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Line	Identified	1	27	76	227	107	466	0	68	81	262	619	1030
	Completed	1	27	76	227	107	466	0	68	81	262	619	1030
	Open	0	0	0	0	0	0	0	0	0	0	0	0
	Outstanding	0	0	0	0	0	0	0	0	0	0	0	0
Automation	Identified	0	1	0	0	0	1	2	2	0	4	7	15
	Completed	0	1	0	0	0	1	2	2	0	4	7	15
	Open	0	0	0	0	0	0	0	0	0	0	0	0
	Outstanding	0	0	0	0	0	0	0	0	0	0	0	0
Network Property	Identified	0	0	0	0	0	0	6	11	161	76	0	254
	Completed	0	0	0	0	0	0	6	11	161	76	0	254
	Open	0	0	0	0	0	0	0	0	0	0	0	0
	Outstanding	0	0	0	0	0	0	0	0	0	0	0	0

Commentary on Table 17:

No open or overdue unplanned Bushfire Work Orders as at 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, next maintenance and 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.