



TransGrid

ENSMS Performance Report

1 July to 30 September 2018

31 October 2019

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ENSMS Performance Reporting

This report provides general information about the performance of TransGrid's Electricity Network Safety Management System (ENSMS) as implemented in accordance with the Electricity Supply (Safety and Network Management) Regulation 2014 (ESSNM Regulation) and Australian Standard AS 5577¹. This report has been produced in accordance with IPART's Electricity Networks Reporting Manual for ENSMS (version April 2018) for the 1 July 2018 to 30 September 2018 as a transition to the commencement of the August 2018 Reporting Manual.

During the first three months of the 2018 – 2019 financial year, 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.

These management systems are informed by TransGrid's Risk Management Framework which adheres to ISO 31000 standard.

¹ AS 5577 – Electricity Network Safety Management Systems

1. Safety and reliability of the network operator's network

1.1 Programs and activities undertaken to maintain or improve the safety and reliability of the network operator's network

During 1 July to 30 September 2018, TransGrid continued to focus on the worker safety programs initiated in the 2017–2018 financial year. In addition to the continual improvement opportunities on existing initiatives, TransGrid implemented further improvement to the Health and Safety and Environmental Management Systems. These initiatives are targeted to enhance safety culture and continually improve TransGrid's control of the key hazardous events nominated in TransGrid's ENSMS.

System

TransGrid undertook Health Safety and Environment (HSE) system updates and improvements in the following areas:

- > Fatigue Management – update of existing procedure to clarify standby work planning and standby workers, and people leader's responsibilities in the fatigue management process and when they must provide authorisation for work shift or work period extension.
- > Chain of Responsibility (CoR) – development of a new procedure to comply with the new chain of responsibility law, which makes sure everyone in the supply chain shares responsibility for ensuring breaches of the Heavy Vehicle National Laws do not occur.
- > National Greenhouse and Energy Reporting (NGER) – development of a new procedure to document the method used by TransGrid to collect, collate, interpret and report on its National Greenhouse and Energy Reporting (NGER) obligations. The procedure sets out the methods used for determining, calculating and sampling or estimating data.
- > Aboriginal Heritage Due Diligence Assessment – development of a new procedure to document the process for TransGrid personnel to follow to assess the potential for harm to Aboriginal Sites or objects for its construction and maintenance activities.
- > Waste Management of Oil and Oil-Filled Assets.
- > Managing the Risk of Falls – After the implementation of WASP (TransGrid's automated system for generating work and safety packages), the management of falls risk documentation has been consolidated with Substation Plant, Transmission and Communication Structures, and Mobile Elevated Work Platforms work instructions being included in the main procedure.

Leadership

Continuation of existing programs including:

- > Targeted Leadership Training for Frontline Leaders designed to provide our asset-facing crew leaders the appropriate tools to manage a team of workers and to recognise and address issues on site.

Organisational Behaviour

TransGrid progressed to the next phase of the following existing initiative:

- > Heads Up Safety Conversation Program.

Resourcing

- > Further refinements to the Capabilities Framework for this existing initiative.

Knowledge Transfer

- > Safety Communication Improvements – introduction of video as a medium to improve safety communication and knowledge transfer (new initiative).
- > Safety in Design – renewed focus on Safety in Design meetings and inclusion of all relevant stakeholders.
- > Contractor Safety Forum – TransGrid hosted a contractor safety forum with all of its major contractors to share safety knowledge and process improvements across our sector (new initiative).

HSE Requirements

TransGrid simplified the presentation of information in the Health Safety and Environment section of TransGrid's internal web portal to assist staff to locate specific guidelines and instructions.

Public Safety

TransGrid also commenced the following programs relating to public safety:

- > Installation of Closed Circuit Television (CCTV) cameras – the program of installation of CCTV cameras at selected TransGrid sites that do not have this function has commenced. Coupled with other detection systems, CCTV allows TransGrid to identify and better respond to unauthorised access incidents leading to improved public safety outcomes.

Network reliability

Network reliability is managed across the asset lifecycle to deliver value to the consumer and to manage safety risks arising from the loss of electricity supply. TransGrid continued to deliver a high level of network reliability, with no reliability incidents (as defined by the IPART incident reporting guidelines) recorded during 1 July to 30 September 2018 period.

Review/Audit of the ENSMS

During 1 July to 30 September 2018, TransGrid's ENSMS did not undergo any review or audit.

Table 1: Non-compliances relating to the safety and reliability of the electricity network

Identified non-compliances (Non Material Non-compliant audit criteria)	Actions against non- compliances	Progress of actions
NA	NA	NA

2. Advice to the public about hazards associated with electricity in relation to the network operator's network

2.1 Programs and activities undertaken to promote the public knowledge and understanding of electrical network safety hazards

TransGrid continued to implement its Public Electricity Safety Awareness Plan (**PESAP**) during the 1 July to 30 September 2018 period. The following programs and activities were undertaken to promote public knowledge and understanding of electrical network safety hazards, and are targeted to a broad public spectrum on the basis of the key hazardous events identified in TransGrid's ENSMS:

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

The brief description of these programs with reference to hazard assessments that have identified the 'at risk' groups targeted by each program is provided in the PESAP. All these are ongoing programs.

A specific Public Electrical Safety Awareness campaign was launched in July 2018. The objective was to raise awareness of safety in relation to TransGrid infrastructure in the ACT and surrounding areas. The campaign focussed on raising the awareness of members of the public entering substation sites or climbing transmission lines.

This campaign was advertised through social media and targeted to areas surrounding the three substations in the ACT.

2.2 Management of bushfire risk relating to electricity lines and other assets of the network operator's network that are capable of initiating bush fire

2.2.1 Programs and activities undertaken to maintain or improve the management of bushfire risk associated with the network operator's network

TransGrid's bushfire risk management process involves:

- > identifying the key hazards related to bushfire, such as asset failure and hot works
- > quantifying the probability of failure using degradation models, asset condition data collected in the Asset Inspection Manager (AIM) and statistical analysis
- > evaluating the risk and prioritising assets by risk value
- > developing risk mitigations (such as the maintenance plans) and evaluating their effectiveness.

TransGrid utilised the following programs in the reporting period to promote the safe management of bushfire risk associated with the electricity network:

- > LiDAR response notification program
- > Aerial Patrol communications with effected landowners

Review/Audit of the ENSMS

During 1 July to 30 September 2018, the bushfire risk management aspect of TransGrid's ENSMS did not undergo any review or audit. Accordingly, there is no information to be reported in Table 2 for this period.

Table 2: Non-compliances relating to the management of bushfire risk associated with the electricity network

Non-compliant audit criteria	Actions against non-compliances	Progress of actions
NA	NA	NA

2.3 Bushfire risk management report

TransGrid's annual Bushfire Risk Management Report covering the 1 October 2017 to 30 September 2018 reporting period is publically available on the TransGrid website <http://www.transgrid.com.au>.

3. Contextual Information

3.1 Deviation from standards

TransGrid maintains various management systems and follows the business processes and procedures established within its systems for all its organisational functions. Adherence to these systems are ensured by a three line of defence approach incorporating:

1. Compliance Risk Owners – Business Units, Groups and teams
2. Independent review and challenge – Management System reviews and Corporate Risk oversight
3. Independent assurance – Corporate internal and external third party audit.

Any identified deviation is raised and escalated appropriately within the management structure for appropriate action.

TransGrid maintains and uses substation, transmission line and cable Standard Design Manuals and Standard Construction Manuals, each of which references internal standards, Australian Standards, international standards such as IEEE and IEC, national or international codes, and industry guidelines to plan, build, commission, operate, maintain and decommission its transmission network assets.

TransGrid also follows Safety in Design and HAZCON process for all work in compliance with the *Work Health and Safety Act 2011*.

No deviation from standards, codes and guidelines were identified in the reporting period.

Table 3: Deviations from standards

Deviation description	Justification
NA	NA

3.2 Significant community infrastructure

TransGrid operates and manages the high voltage electricity transmission network in NSW and the ACT and supplies electricity to four distribution network service providers (**DNSPs**). TransGrid's network supplies electricity to more than 3 million homes, businesses and communities in NSW and ACT. TransGrid transports electricity from generation sources such as wind, solar, hydro, gas and coal power plants to large directly connected industrial customers and the four DNSPs that deliver it to homes and businesses. Comprising over 100 substations, approximately 13,000 km of high voltage transmission lines and cables, and five interconnections to Queensland and Victoria, TransGrid underpins economic growth and facilitates energy trading between Australia's largest states.

TransGrid considered the guidance and examples provided in the IPART Electricity Network Reporting Manual (Safety management systems) Appendix A Section A.3.2 and notes that it does not classify individual loads as significant community infrastructure in the manner described. Given the scale of TransGrid's operations, and the potential impacts, all assets are considered critical infrastructure.

TransGrid's business practices and its management systems work to assess the criticality and mitigate the risk from its network assets and to ensure that the risk to health and safety, network reliability and bushfire are managed to As Low as Reasonably Practicable (**ALARP**).

4. Formal safety assessment reviews and residual risks

4.1 Classification of risk levels

TransGrid's Enterprise Risk Management (**ERM**) Framework sets out the process and criteria for undertaking risk assessments across the organisation. The ERM Framework defines an acceptable threshold level along with reporting requirements to senior management and the Board. The ERM Framework stipulates:

- > TransGrid has a risk tolerance set at 'Medium' in its Risk Management Framework.
- > 'Extreme' and 'High' risks are only acceptable where mitigation plans are in place and ALARP can be demonstrated.
- > It is expected that for residual risks, where ratings level are assessed as 'High' or 'Extreme', that the treatments are escalated to the Chief Executive Officer for approval.
- > Inherent risks rated 'High' or 'Extreme' must have their associated treatments approved by the Executive Manager of the Business Unit.

4.2 Risks within the scope of the ENSMS

TransGrid's ERM Framework follows the AS/NZS ISO 31000:2009 Risk Management – Principles and Guideline and provides an integrated and structured approach to managing risks within the risk appetite reviewed annually and set by the TransGrid Board. The ERM Framework provides guidance on the roles and responsibilities expected of the Board, management and staff when escalating, managing and treating risks as they arise. Risk priorities are cascaded down from the strategic level, to the business unit levels and project levels.

The following strategic risks are addressed in TransGrid's ENSMS:

- > Bushfire risk
- > Environment and property damage risk
- > Network reliability safety risk
- > Safety risk (both public and workers).

These risks are managed and reduced to ALARP. This risk reduction is codified in the work procedures, processes and business activates consisting in the various management systems that ENSMS leverage to achieve the desirable safety outcomes.

4.3 Reviews of formal safety assessments

TransGrid's Formal Safety Assessments (**FSAs**) are summarised below:

- > **Bushfire:** Considers network related bushfire risks. This includes the management of safety risks associated with bushfires in proximity to TransGrid's assets, as well as bushfires that may be ignited by TransGrid's activities and/or assets.
- > **Environment and Property:** Considers the risk of damage to the environment and property during the whole lifecycle of TransGrid's activities associated with the network.
- > **Public Safety:** Considers safety risks to the general public resulting from TransGrid's assets, including people working near TransGrid's network assets. This includes public safety aspects arising from the protection of the environment (excluding bushfire risk, which is addressed in a separate FSA).

- > **Network Reliability Safety:** Considers safety risks arising from the loss of electricity supply, including network planning, continuity of electricity supply and physical security of assets.
- > **Worker Health and Safety:** Considers safety risks to employees and contractors working on or near TransGrid's network. This includes worker health and safety aspects arising from the protection of the environment (excluding bushfire risk which is addressed in a separate FSA).

The FSAs and associated safety risks are reviewed and updated periodically, or as required in response to a serious network related safety incident. During 1 July to 30 September 2018, none of the FSAs were reviewed or updated.

5. Safety risk management actions

TransGrid monitors all hazards, near miss incidents and actions from its management reviews associated with its risk management systems.

The data presented in Table 4 is derived from the risk management systems for 1 July to 30 September 2018 period as a summary of all relevant management system actions associated with the ENSMS. The data is derived from the monitoring of a range of actions resulting from incident investigations, management and external audits, and near misses.

Table 4: Risk management actions – open, completed and raised

Criteria	Number
Number of risk management actions within the ENSMS scope that were raised in the reporting period	Bushfire Risk Management = 0
	Covering multiple FSAs = 7
	Environment and Property = 5
	Network Reliability Safety = 2
	Public Safety = 0
	Worker Health and Safety = 10
Number of open safety risk management actions within the ENSMS scope from any reporting period	Bushfire Risk Management = 0
	Covering multiple FSAs = 5
	Environment and Property = 4
	Network Reliability Safety = 1
	Public Safety = 0
	Worker Health and Safety = 4
Percentage of safety risk management actions within the ENSMS scope completed by the due date within the reporting period	Bushfire Risk Management = NA
	Covering multiple FSAs = 29%
	Environment and Property = 20%
	Network Reliability Safety = 50%
	Public Safety = NA
	Worker Health and Safety = 60%

6. Compliance with directions

TransGrid received one notice of direction IPART during 1 July to 30 September 2018 pertaining to its ENSMS. This was received 18 September 2018 and required the completion of an audit of TransGrid's Safety Management System by 13 May 2019. This audit was completed in prior to the due date.

Table 5: Data on directions issued by IPART

Total number of directions issued by IPART	Total number of directions outstanding	Number of outstanding directions not complied with by the due date
1	1	0

7. Outstanding directions not complied with

There were no outstanding directions as at 30 September 2018.

8. Statistical Reporting

8.1 Network asset failures

Table 6 lists the quantity of TransGrid-owned assets and asset failure statistics.

TransGrid does not maintain a *target functional failure rate* metric for its network assets in its business practice and therefore is unable to report such a statistic in Table 6. TransGrid manages its assets to monitor and control the risk of failure (a function of both the failure rate and the consequence of failure) to an acceptable level rather than defining a target for functional failure rates.

A conditional failure is interpreted as those network assets which were replaced during 1 July to 30 September 2018 as part of TransGrid's replacement capital program.

TransGrid interprets the network asset functional failures to be the count of incidents when the particular network asset types were unable to meet the expected or specified performance standard in during 1 July to 30 September 2018 period, thereby causing an outage and/or incident. No asset functional failures were defined as 'Assisted', that is, due to the interaction of external objects or influences on the network structure/equipment that were beyond the control of TransGrid.

Table 6: Network asset failures

Asset type	Asset population or length ²	Conditional failures in the reporting period	Functional failures (for reporting period)			
			Unassisted		Assisted	
			No fire	Fire	No fire	Fire
Pole/Tower	37,407	227	0	0	0	0
Conductor – Transmission / sub-transmission	11,395 km	0	0	0	0	0
Primary plant – power transformers	224	0	1	0	0	0
Primary plant – reactive plant	167	1	6	0	0	0
Primary plant – switchgear	13,273	35	4	0	0	0
Secondary plant – protection equipment	3,354	29	3	0	0	0

² Statistics as of 30 June 2018. Refer ENSMS Annual Performance Report 1 October 2018 to 30 September 2019 for updated figures.

Asset type	Asset population or length ²	Conditional failures in the reporting period	Functional failures (for reporting period)			
			Unassisted		Assisted	
			No fire	Fire	No fire	Fire
Secondary plant – SCADA	2,004	0	1	0	0	0
Secondary plant – substation batteries	217	0	1	0	0	0

9. Encroachment on network assets

TransGrid has reviewed all the recorded work orders associated with vegetation encroachments active during 1 July to 30 September 2018 reporting period. The results are presented in Table 7.

Table 7: Vegetation

Criteria	Inside bushfire prone areas	Outside bushfire prone areas
Category 1 defects	0	0
Category 2 defects overdue	0	0
Category 3 defects overdue	0	0
Category 4 defects overdue	1	0
Total vegetation encroachments as a result of third parties	Not Applicable	Not Applicable

TransGrid uses routine LiDAR inspections for the purposes of vegetation management, in conjunction with aerial and ground based inspections. TransGrid has previously carried out a low span inspection program via Aerial Laser Survey to identify such violations. The identified violations were assessed to prioritise corrective investment where applicable. TransGrid conducts routine aerial and ground based inspections which serve multiple purposes, including identifying vegetation encroachments.

TransGrid notes that it does not presently conduct any routine annual inspection of overhead spans specifically to identify ground clearance issues. Hence, there is no planned inspection and defect data to report in Table 8 for 1 July to 30 September 2018 reporting period.

Table 8: Ground clearance

Criteria	Inside bushfire prone areas	Outside bushfire prone areas
Number of OH spans for which inspections were planned	0	0
Number of OH spans for which inspections became overdue	0	0
Number of OH spans for which LIDAR inspections became overdue	0	0
Number of defects identified	0	0
Number of defect rectifications that became overdue	0	0
Total ground clearance encroachments as a result of third parties	0	0

TransGrid maintains an easement encroachment register for the purpose of recording issues related to clearance to third party structures. These encroachments are recorded as field staff identify a potential issue through inspection. Table 9 lists a total of 2 encroachment issues associated with clearance to third party

structures identified during 1 July to 30 September 2018. Each encroachment is assessed for risk and appropriate action taken with the landowner or operator.

Table 9: Clearance to structures

Criteria	Inside bushfire prone areas	Outside bushfire prone areas
Category 1 defects	0	0
Category 2 defects overdue	0	0
Category 3 & 4 defects overdue	0	0
Total structure clearance encroachments as a result of third parties	0	2

10. Unauthorised access to the network

TransGrid's security policy is based around the principles of deter, delay, detect and respond. A number of physical controls (such as security fences, restricted locks and keys, and anti-climbing devices) and other controls (such as signage, lighting and awareness) are in place to manage the risk of unauthorised entry.

Given the reliance on effective electronic monitoring and response, TransGrid does not conduct specific routine security inspections on substation and communication sites to identify unauthorised access to its network by its workers, contractors and members of the public.

TransGrid conducts routine patrols of its underground electricity cables to identify activities that might threaten the cable, identify encroachments and monitor the condition of above ground structures (such as bridges and tunnel access shafts).

TransGrid also conducts inspections on selected overhead transmission line structures to provide a high degree of assurance that the easements and transmission lines do not pose a public safety risk. The individual structures selected and the associated inspection frequencies are chosen on the basis of risk. These inspections are in addition to the typical routine inspections.

Table 10 lists one unauthorised access incidents to TransGrid network assets during 1 July to 30 September 2018.

Table 10: Unauthorised access to the network

Criteria	Network Operator	Accredited Service Providers	General Public
Major substations and switching stations	0	0	0
Distribution substations, regulators, switches and associated equipment	Not Applicable	Not Applicable	Not Applicable
Electricity mains outside major substations	0	0	1
Communications equipment outside major substations	0	0	0

11. Customer Safety Reporting

This reporting is not applicable to TransGrid.

Table 11: Customer safety reporting

Criteria	Number
Number of customer shocks from installations caused by the ENO's electricity network	Not Applicable

12. ENO comments

TransGrid has no further comments for the 1 July to 30 September 2018 reporting period.