

SYDNEY METRO NORTHWEST

METRO TRAINS SYDNEY

**ANNUAL SAFETY MANAGEMENT
SYSTEM REPORT**

1st July 2017 – 30th June 2018

Document Record

Document Number: NWRLOTS-NRT-SWD-HV-RPT-720237

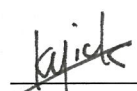

Compilation Date	Compiler	Approver
Sept 2018	 Tommi Yick HV Electrical Manager MTS Date: SEPT 2018 (Document was reviewed by Brett Brimfield, Safety Director, MTS)	 Ivan Lai CEO MTS Date: SEPT 2018

Table of Contents

Annual performance reporting - ENSMS	4
1 Safety and reliability of the network operator's network	5
1.1 Programs and activities undertaken to maintain or improve the safety and reliability of the network operator's network	5
2 Advice to the public about hazards associated with electricity in relation to the network operator's network.	6
2.1 Programs and activities undertaken to promote the public knowledge and understanding of electrical network safety hazards	6
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	6
2.3 Bushfire risk management report	6
3 Contextual Information	7
3.1 Deviation from standards	7
3.2 Significant community infrastructure	7
4 Formal safety assessment reviews and residual risk	8
4.1 Classification of risk levels community infrastructure	8
4.2 Risk within the scope of the ENSMS	8
4.3 Review of formal safety assessments	8
5 Safety risk management actions	9
6 Compliance with directions	10
7 Outstanding directions not complied with	11
8 Statistics Report	12
9 Encroachment on network assets	14
10 Unauthorised access to the network	15
11 Customer Safety Reporting	16
12 ENO comments	17
Appendix 1 Overview of Sydney Metro Northwest Electrical Distribution System	
Appendix 2 Detailed Description of Network	
Appendix 3 NRT Risk Management Plan	
Appendix 4 Commissioning Event 2 Safety Assurance Statement	
Appendix 5 Commissioning Event 3 Safety Assurance Statement	
Appendix 6 Commissioning Event 4 Safety Assurance Statement	
Appendix 7 Commissioning Event 5 Safety Assurance Statement	
Appendix 8 Bush Fire Management Report	

Annual performance reporting - ENSMS

This section of the report is to provide general information about the Electricity Network Operator's (ENO's) performance of their Electricity Network Safety Management System (ENSMS) implemented in accordance with the Electricity Supply (Safety and Network Management) Regulation 2014 and Australian Standard AS 5577.

[This template provides the base level of information required by IPART. The ENO may add any information or commentary as they see fit to supplement this base information.]

The Metro Trains Sydney (MTS) Safety Management System (SMS) provides the management model for both strategic planning and day-to-day safety management of railway operations. As an integral part of the model, Element 32 Management of the Electrical Distribution Network is developed in accordance with the Electricity Supply (Safety and Network Management) Regulation 2014 s.5, for the Sydney Metro Northwest the Network Operator to take all reasonable steps to ensure that the design, construction, commissioning, operation, and decommissioning of its electrical network is safe. The Electricity Supply (Safety and Network Management) Regulation 2014 s.7(1)(a) also mandates that the MTS SMS must also be in accordance with the requirements of AS 5577 Electrical Network Safety Management Systems in the management model. A description of the Electricity Network operated by MTS is given in Appendix 1 and 2.

The reporting period is from 1st July 2016 to 30th June 2017. During this time, MTS's metro system from SMTF Depot to Chatswood was under construction and passenger rail service was not yet available for public use.

Several 132kV, 33kV and 11kV substations at the western end of the metro system were energised to support the construction program:

Towards the western end of the metro system:			
132kV Substation(s)	33kV Substation(s)	11kV & 415V Substation(s)	
SMTF	SMTF Depot	SMTF Depot	Kellyville
-	Rouse Hill	Cudgegong Road	Bella Vista
-	Bella Vista	Rouse Hill	Norwest

Energised 132kV, 33kV and 11kV substations were comprehensively tested prior to their use.

Energised 132kV, 33kV and 11kV substations were - and will continue to be - subjected to further tests to ensure compatibility with other rail systems which are being progressively brought online. Overall completion of the metro system for commencement of passenger service will not take place until 2019.

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

[The ENO is to use this section to provide a brief description of any programs, initiatives and activities implemented to promote the safety and reliability of the electrical network outside of a business as usual context (e.g., trials of new technologies, asset management systems and maintenance procedures).

These descriptions are to include a reference to hazard assessments that have identified the 'at risk' elements targeted by the program or activity. The descriptions are to identify whether the program is a new or ongoing program. Where a program is ongoing, the description will outline any reviews undertaken to verify its effectiveness and appropriateness.]

Nil. MTS's metro system was under construction.

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

Identified non-compliances	Actions against non-compliances	Progress of actions
<p>On 16 November 2017 TCFT Business Services released its final audit report "Compliance Audit of Electricity Management System of Metro Sydney's compliance with the Electricity Supply (Safety and Network Management) Regulation 2014 (the Regulation) using the audit criteria in IPART's Electricity Networks Audit Guideline – May 2017 (the Guideline).</p> <p>The audit report contained 10 non-conformances.</p>	<p>MTS proposed one or more responses/actions for each of the 10 non-conformances identified.</p>	<p>As of 30th Jun 2018, actions for 6 out of the 10 non-conformances were due. All 6 were actioned by MTS prior to the due date.</p>

[The ENO is to use this table to provide a summary of non-compliances within the ENSMS (as opposed to non-compliances or defects on the network) relating to safety and reliability of the electricity network identified through audits, reviews, safety assessments and incident investigations. Additionally, any actions identified to address the non-compliances are to be identified and the progress tracked. This table will cover non-compliances identified within the year for which the report relates, any non-compliances addressed within this year and any non-compliances outstanding from previous years.]

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

[The ENO is to use this section to provide a brief description of programs and activities implemented to promote the public knowledge and understanding of electrical network safety hazards. These descriptions are to include a reference to hazard assessments that have identified the 'at risk' groups targeted by the program or activity. The descriptions are to identify whether the program is a new or ongoing program. Where a program is ongoing, the description will outline any reviews undertaken to verify its effectiveness and appropriateness.]

Nil. MTS's metro system was under construction.

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

[The ENO is to use this section to provide a brief description of programs and activities implemented to promote the public knowledge and understanding of electrical network safety hazards. These descriptions are to include a reference to hazard assessments that have identified the 'at risk' groups targeted by the program or activity. The descriptions are to identify whether the program is a new or ongoing program. Where a program is ongoing, the description will outline any reviews undertaken to verify its effectiveness and appropriateness.]

Nil. MTS's metro system was under construction.

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

Identified non-compliances	Actions against non-compliances	Progress of actions
Nil	Nil	Nil

[The ENO is to use this table to provide a summary of non-compliances within the ENSMS (as opposed to non-compliances or defects on the network) relating to the management of bushfire risk identified through audits, reviews, safety assessments and incident investigations. Additionally, any actions identified to address the non-compliances are to be identified and the progress tracked. This table will cover non-compliances identified within the year for which the report relates, any non-compliances addressed within this year and any non-compliances outstanding from previous years]

2.3 Bushfire risk management report

The ENO is to attach the previous calendar year's bushfire risk management report. The ENO may provide any relevant commentary relating to this report.]

Previous bushfire report included in appendix 8.

3 Contextual Information

3.1 Deviation from standards

[Where an ENO has deviated from established internal or external standards, codes and guidelines, they are to list these deviations. Each deviation is to be accompanied by an explanation as to why safety it is at the same level or superior to what would be achieved under the standards. This list is to include deviations in the system as well as stand-alone site instances.]

Nil. MTS's metro system was under construction. The HV system was design and is being constructed according to standards, codes and guidelines.

Table 3 Deviations from standards

Deviation description	Justification
Nil	Nil

[The deviation description is to outline what the deviation was and whether it is a system or site specific deviation.]

3.2 Significant community infrastructure

[For the purposes for incident reporting over the previous financial year, [ENO] considered the following to be significant community infrastructure – list pieces of significant community infrastructure. Examples of significant infrastructure are:

- Peer group A1, A2, A3 and B hospitals.*
- Road tunnels on motorways that have emergency evacuation systems.*
- Rail and air transport systems where travel is affected.*
- Events and buildings where greater than 5000 people could be affected by an outage*
- Other community infrastructure determined by the Network Operator to be of National, State or Regional significance.*

The network operator should consider the community they serve and the risks to that community as a result of the loss of infrastructure when determining whether a piece of infrastructure is to be voluntarily included in their list.]

Not Applicable. MTS's metro system was under construction. Network was not for public use.

4 Formal safety assessment reviews and residual risk

4.1 Classification of risk levels community infrastructure

[The ENO will provide the thresholds for which it classifies a risk as low, intermediate, high or extreme to align with appendix B of AS 5577.]

The NRT Risk Management Plan (NWRLOTS-NRT-PRD-PM-PLN-000806) provides background on the risk management systems operating to manage risk on the Sydney Metro Northwest project. This Plan is provided at Appendix 3.

4.2 Risk within the scope of the ENSMS

[The ENO will describe the organisations risks it has incorporated into its ENSMS. The ENO will identify which of these risks are not at ALARP. Where a risk is not at ALARP, the Network Operator will summarise the cause and identify the treatment actions to bring this risk to ALARP status. Where a risk is at ALARP but maintains a residual risk of intermediate or higher, the ENO will articulate why this residual risk is tolerable.]

MTS metro system was under construction during the reporting period and equipment/infrastructure were subjected to testing and commissioning activities.

MTS participates as part of the NRT Consortium in the management of risk for the Design and Commissioning of the electrical network. To demonstrate that electrical risks have been considered as part of the commissioning events which have occurred within the reporting period, please refer to the hazard logs of Safety Assurance Statements CE2, CE3, CE4, CE5 provided at Appendix 4 to 7.

4.3 Review of formal safety assessments

[The ENO will describe which formal safety assessments relating to ENSMS scoped risks have been reviewed in the year to which the report relates. This description will include details of the trigger, the findings and outcomes of the review.]

Nil. MTS's metro system was under construction. No reviews of Formal Safety Assessments undertaken in the reporting period.

5 Safety risk management actions

[For each open safety risk management action within the ENSMS scope, at the conclusion of the reporting year, the ENO is to describe the relevant risk, the proposed risk management actions and the progress against these actions.]

Please refer to section 7.2.2 of Safety Assurance Statements CE2, CE3, CE4 & CE5 provided at Appendix 4 to 7.

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 year	14
Number of open safety risk management actions within the ENSMS scope from any reporting year	0
Percentage of safety risk management actions within the ENSMS scope completed by the due date within the reporting year	100%

6 Compliance with directions

[The following table is for ENO to report how many directions have been issued by IPART under clause 13 of the Electricity Supply (Safety and Network Management) Regulation 2014 within the reporting year, how many directions are yet to be addressed and how many outstanding directions have not been complied with by the directions deadline.]

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 (the direction was to follow up on IPART's audit findings - see section 1.1 of this report)	0	0

7 Outstanding directions not complied with

[The ENO will provide a summary of each outstanding direction that is past its due date. The summary will include a description of the response to each direction and the reason that it is past due.]

Nil.

8 Statistics Report

Table 6 Network asset failures

Asset Type	Asset population or length (Note: data are estimates of the MTS system when fully completed in 2019)	Target functional failure rate	Conditional failures past due in the reporting year	Functional Failures			
				Unassisted		Assisted	
				No fire	fire	No fire	Fire
Pole	0						
Pole top structures/components	0						
Conductor - Transmission/sub - transmission	50km (in route length) of 33kv feeders; 3km (in route length) of 132kv feeders.						
Conductor - High Voltage	74km (in rough length) of 11kv feeders.						
Conductor - Low voltage							
Service wire	0						
Primary plant - Power transformers	5						
Primary plant - distribution transformers	56						
Primary plant - Reactive plant	0						
Primary plant – switchgear	200						
Secondary plant - protection equipment							
Secondary plant – SCADA	30 power control system units						
Secondary plant – substation batteries	30 banks						

Notes:

MTS's metro system was under construction during the reporting period. Functional completion of the metro system for the commencement of passenger service will not take place until 2019.

Within the reporting period, an incident occurred due to a VT failure at MTS's SMTF depot which led to irreparable damage to the VT itself and some damage to the enclosure it was housed in. When personnel entered the room after isolation of the incoming power supply, smoke was observed and a fire extinguisher was used in the VT enclosure to ensure any fire was extinguished. There was no injury to personnel. The details of the incident is described in a report included in attachment 9.

SYDNEY METRO NORTHWEST

Annual Safety Management System Report

[The ENO may insert any commentary they see fit to explain or justify the target failure rates or any issues that may have contributed to the observed failure rates. [The ENO may use more detailed information when reporting statistics. These can be added under the headline metrics.]

9 Encroachment on network assets

Table 7 Vegetation

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

Table 8 Ground Clearance

Criteria	Inside bushfire prone areas	Outside bushfire prone area
Number of OH spans for which inspections were planned	0	35
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

Table 9 Clearance to structures

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

[Reporting on encroachments is to consist of all defects newly identified during the reporting period. The ENO may provide commentary as they see fit relating to encroachments on their network. The rectification of a defect includes where a network asset ceases to encroach as a result of deviating from standards as per section 2. Note that a structure is regarded as 'a stationary object that is built, constructed or erected, temporarily or permanently, at the direction of a person or persons'.

Category 1 Defects: Defects that pose a direct and immediate risk to the safety of the public/staff and requiring immediate rectification.

Category 2 Defects: Defects that pose a risk to the safety of the public/staff and require rectification with one month.

Category 3 Defects: Defects that pose a predictable future risk to the safety of the public/staff and require rectification within 6 months

Category 4 Defects: Defects that pose a predictable future risk to the safety of the public/staff but can be rectified through planned maintenance.]

10 Unauthorised access to the network

[The ENO is to report the number of times in the reporting year that there has been unauthorised access to their network. This includes unauthorised access by their workers and by other parties. The ENO will also report on the number of planned security inspections to be undertaken on their network assets and the number of inspections that became overdue, as well as the number of security inspections from any year that are still overdue.]

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	0	0	0
Electricity mains outside major substations	0	0	1 (Incident relates to an unknown person intentionally damaging an electrical conduit on site. The unknown person was unlikely to be a member of the public, but this could not be ascertained. Cables inside the conduit were not damaged.)
Communications equipment outside major substations	0	0	0

11 Customer Safety Reporting

[The ENO is to report on activity and safety issues identified with private electrical installations connected to their network. Note that the Electricity Supply Amendment (Advanced Meters) Act 2016 includes amendments to the Electricity Supply (Safety and Network Management) Regulation 2014. As a result of these amendments, IPART is interested only in customer installation safety incidents as a result of the network operators electricity network or their workers.]

Table 11 Customer safety reporting

Criteria	Number
Number of customer shocks from installations caused by the ENO's electricity network	

Not applicable. MTS's metro system was under construction; there were no private electrical installations connected to MTS's network.

12 ENO comments

[The ENO may include commentary in this section as they see fit.]

Nil.

Appendix 1 Overview of Sydney Metro Northwest Electrical Distribution System

Appendix 2 Detailed Description of Network