

Annual Compliance Report pro forma

Annual Compliance Report for 2018-19

Submitted by Metro Train Sydney (MTS), ACN: 600 820 737

To: The Chief Executive Officer
Independent Pricing and Regulator Tribunal of NSW
PO Box K35
Haymarket Post Shop NSW 1240

Metro Train Sydney (Non-licence) reports as follows:

1. This report documents compliance during 2018-19 with all obligations to which Metro Train Sydney (Non-licence) is subject by virtue of its Transmission Operator or Distribution Network Service Provider Licence.
2. This report has been prepared by Metro Train Sydney (Non-licence) with all due care and skill in full knowledge of conditions to which it is subject and in compliance with IPART's current Electricity Networks Reporting Manual - Annual compliance reporting.
3. Schedule A provides information on all obligations with which Metro Train Sydney (Non-licence) did not fully comply during 2018-19.
4. Other than the information provided in Schedule A, Metro Train Sydney (Non-licence) has complied with all conditions to which it is subject.

Signed: 

Name: Timothy Noy

Designation: Acting CEO MTS

Date: 3/10/19

Signed: 

Name: Terry Wong

Designation: Chairman of the MTS Board of Directors

Date: 3/10/2019

Note - Signatories must be:

- The Chair of the Board of Directors of the licence holder or a duly authorised Board Member of the licence holder, and
- The CEO or equivalent (eg, Managing Director if there is no CEO). Where the CEO (or equivalent) has delegated this responsibility, IPART may request evidence of the delegation.

Schedule A Non-Compliances^a

Legal reference ^b	Reporting period in which the breach occurred ^c	List obligations breached, including a brief description of each obligation	Describe: Nature and extent of non-compliance (including whether and how many customers and/or other licence holders have been affected) Reasons for non-compliance Remedial action taken Actual/anticipated date of full compliance
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NIL

^a Licence holders should report only breaches that were identified during the reporting period.

^b Licence condition, section of the ES Act, or section of the Code with which the licence holder has failed to comply.

^c Licence holders should indicate whether the breach occurred in the first half of the financial year, the second half of the financial year, or both.

Annual Performance Reporting

MTS

Safety Management System Performance Measures

For the periods

1 July 2018 – 30 September 2018 (3 months)

and

1 Oct 2018 - 30 September 2019 (12 months)

A Annual performance reporting framework

A.1 Tier 1 - Major incidents

Tier 1 incidents are defined as a 'Major Incident' in accordance with the Electricity networks reporting manual - Incident reporting (Incident reporting).⁶ Table A.1 provides a template for the minimum reporting requirements

Table A.1 Major incidents

ESSNM Objective	Description of each major incident reported under the Incident reporting requirements
Safety of members of the public	Nil
Safety of persons working on network	Nil
Protection of property	Nil
Third party property	Nil
Network property ^a	Nil
Safety risks arising from loss of electricity supply ^b	Nil

^a Network property losses are not reportable under IPART's Reporting Manual Incident reporting requirements. For the purpose of this Reporting Manual, a network operator is to report each event in which losses exceed \$500,000 in relation to damage caused to *electricity works* as defined in the *Electricity Supply Act 1995*.

^b As defined for major reliability incidents in IPART's Reporting Manual Incident reporting requirements.
⁶ More information about Incident reporting is available on our webpage, here: <https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/energy-network-regulation-administrative-energy-licensing-website-documents/electricity-networks-reporting-manual-incident-reporting-april-2018.pdf>

Tier 1 – Major incidents (having the same definition as given in the ENRM-Incident Reporting, Table A.1 Incident Reporting Matrix, 1. Major incidents) relates to any reporting to IPART during the said period.

A.2 Tier 2 - Incidents

Tier 2 incidents are defined as an 'Incident' in accordance with Incident Reporting. Table A.2 provides a template for the minimum reporting requirements.

Table A.2 Incidents

ESSNM Objective	Description of each incident reported under the Incident reporting requirements
Safety of members of the public	Nil
Safety of persons working on network	Nil
Protection of third-party property	Nil
Safety risks arising from loss of electricity supply ^a	Nil

^a As defined for reliability incidents in IPART's Reporting Manual Incident reporting requirements.

Tier 2 – Incidents (having the same definition as given in the ENRM-Incident Reporting, Table A.1 Incident Reporting Matrix, 1. Incidents) relates to any reporting to IPART during the said period.

A.3 Tier 3 - control failure near miss

Table A.3 Network assets failures

Performance measure	Population	Unit	5-year average functional failures	annual	Annual functional failures (for reporting period)					
					Unassisted		Assisted			
					No fire	Fire	No fire	Fire	Contained	Escaped
132kV Cables (route-km)	1	km	-	-	-	-	-	-	-	-
33kV Cables (route-km)	67	km	-	-	-	-	-	-	-	-
11kV Cables (route-km)	79	km	-	-	-	-	-	-	-	-
132kV Switchgears	2	no.	-	-	-	-	-	-	-	-
33kV Switchgears	68	no.	1 case in 2017	-	Yes	-	-	-	-	-
11kV Switchgears	151	no.	-	-	-	-	-	-	-	-
132/33/11kV Transformers	1	no.	-	-	-	-	-	-	-	-
33/11kV Transformers	4	no.	-	-	-	-	-	-	-	-
11/4kV Transformers	53	no.	-	-	-	-	-	-	-	-
Rectifier Transformers (33/2x.6kV)	20	no.	-	-	-	-	-	-	-	-
Rectifier (1500V)	20	no.	-	-	-	-	-	-	-	-
Negative Earth Resistor	1	no.	-	-	-	-	-	-	-	-
Protection systems	62	set	-	-	-	-	-	-	-	-
Zone/sub transmission/transmission substation SCADA system	30 power control units	set	-	-	-	-	-	-	-	-
Zone/sub transmission/transmission substation Protection Batteries	30 banks	set	-	-	-	-	-	-	-	-

a See the glossary for definitions of unassisted failures and assisted failures.--

Note: The network operator may provide more detailed information when reporting failures. These can be added under the headline metrics.

Table A.4 Vegetation contact with conductors

Performance measure ^a	Event count – This reporting period 2018-19	Event Count – Last reporting period 2017-18	Event count – Two periods ago 2016-17	Event count – Three periods ago 2015-16	Event count – Four periods ago 2014-15	Comment
Fire start – grow in	0	0	0			
Fire start – fall in and blow in	0	0	0			
Interruption ^b – grow in	0	0	0			
Interruption – fall-in and blow in	0	0	0			

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

^b Includes momentary interruptions.

Table A.5 Unintended contact, unauthorized access and electric shocks

Detail	Event Count – This reporting period 2018-19	Event Count – Last reporting period 2017-18	Event Count – Two periods Ago 2016-17	Event Count - Three periods ago 2015-16	Event Count - Four Periods ago 2014-15	Comments
Electric shock^a and arc flash incidents^b originating from network assets^c including those received in customer premises						
Public	0	0	0			EN first declared energized 23/06/17.
Public worker	0	0	0			
Network employee / network contractor ^d	0	0	0			
Accredited Service Provider	0	0	0			
Livestock or domestic pet	0	0	0			
Contact with energised overhead network asset^e (e.g. conductor strike)						
Public road vehicle ^f	0	0	0			EN first declared energized 23/06/17.
Plant and equipment ^g	0	0	0			
Agricultural and other ^h	0	0	0			
Network vehicle	0	0	0			
Contact with energised underground network asset^e (e.g. conductor strike)						
Plant and equipment	0	0	0			EN first declared energized 23/06/17.
Person with handheld tool	0	0	0			
Unauthorised network access (intentional)						
BSP / Transmission substation / switching station	0	0	0			EN first declared energized 23/06/17.
Distribution substation	0	0	0			
Towers / poles	0	0	0			
Other (e.g. communication sites)	0	1 ^{#1}	0			EN first declared energized 23/06/17. #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.
Safe Approach Distance (SAD)ⁱ									
Network employee / network contractor	0	0	0	0	0	0	0	0	EN first declared energized 23/06/17.
Accredited Service Provider	0	0	0	0	0	0	0	0	
Public	0	0	0	0	0	0	0	0	
Public Worker	0	0	0	0	0	0	0	0	

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

c Events caused by network assets, network asset defects or network activities, including shocks received inside customer installations, are to be reported. Customer installation events not associated with network assets are not to be reported.

d Includes all classes of authorised persons (network employee and network contractor). Accredited Service Provider employees are not included.

e Would not normally include contact with a pole, pillar, distribution substation etc., unless the contact results in subsequent contact with an energised asset. **f** Including plant and equipment packed up for travel (i.e., plant and equipment travelling on a public road to or from worksite).

g Cranes, elevated work platforms, cherry pickers, excavators, handheld tools, etc.

h Examples include agricultural equipment, aircraft, watercraft.

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

Table A.6 Reliability and Quality of Supply^a

Performance measure	Event Count - This reporting period 2018-19	Event Count - Last reporting period 2017-18	Event Count - Two periods ago 2016-17	Event Count - Three periods ago 2015-16	Event Count - Four Periods ago 2014-15	Comments
High voltage into Low voltage ^b	0	0	0			EN first declared energized 23/06/17.
Sustained voltage excursions outside emergency range ^c	0	0	0			
Reverse polarity	0	0	0			
Neutral integrity due to poor workmanship or incorrect procedure	0	0	0			
Neutral integrity due to asset defect or failure	0	0	0			

a Reporting is required by distribution network operators only.

b May also be referred to as HV LV intermix or HV injection.

c As defined by network operator with reference to the measurement methodologies used in Australian Standard AS61000.3.100

Table A.7 Reliability and Quality of Supply - Critical infrastructure incidents

Type of critical infrastructure ^a (e.g. hospital, tunnel)	Minutes of supply lost ^b	Cause	Consequential safety impacts associated with supply issue
Nil	N/A	N/A	N/A

^a Critical infrastructure as identified in the network operator's formal safety assessment in relation to the safety risks associated with loss of supply.

^b Number of minutes that the critical infrastructure was without a network supply.

Note: Incidents include outages and supply quality events that adversely impact critical infrastructure.

Table A.8 Network-initiated Property damage events

Detail	Event Count - This reporting period 2018-19	Event Count - Last reporting period 2017-18	Event Count - Two periods ago 2016-17	Event Count - Three periods ago 2015-16	Event Count - Four Periods ago 2014-15	Comments
Third party property (assets including vehicles, buildings, crops, livestock)						
Damage (e.g. Fire, Physical impact or Electrical)	0	0	0			EN first declared energized 23/06/17.
Network property (including non-electrical assets including vehicles, buildings)						
Damage (e.g. Fire, Physical impact or Electrical)	0	1 ^{#1}	0			EN first declared energized 23/06/17. #1 – Incident of Voltage Transformer Failure at SMTF BSP on 27 th July 2017 Stage 3 (Final) Report to IPART.

Note: Event counts should include any event where there is a reasonable likelihood that damage was caused by *electricity works*

A.4 Tier 4 Control implementation

Table A.9 Amendments and improvements to Formal Safety Assessments (FSA) or Associated Risk Treatments^a

FSA	Amendments/ improvements	A																								D	E
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
Access to assets	External fencing, gate guard, locks Door security/alarm systems CCTV monitoring Signages and warning labels	✓		✓											✓	✓											
Access to assets	Electrical fault protection	✓													✓												
Access to assets	Supervision of visitors by authorized staff	✓													✓												
Access to assets	HV AC & 1500V DC cables are screened and with earth sheath	✓													✓												
Access to assets	HV cables are strapped every 0.6 meter apart and tagged with HV danger signs and live cable signs	✓																									
Access to assets	Electrical network not accessible by the public Earthing system installed only inside substation or on viaduct	✓																									
Access to assets	All HV cables (except from utilities to BSP) are installed not in public areas HV cables in public areas are buried and covered with warning tapes	✓		✓																							
Access to assets	HV Cables in public areas are recorded on Dial Before You Dig system Cable routes are available for inspection	✓	✓	✓								✓															
Rules and standards in place at work	Electrical Safety Rules in place																										
	Electrical aspects of project induction for staff/contractor/visitor																										
	Electrical permit to work system in place																										
	Permit holder's training for staff																										
	Certifications procedure for staff																										
	Staff possess competencies as per requirement of their roles	✓										✓	✓	✓				✓								✓	
	Appropriate supervision																										
Equipment design	Relevant trainings																										
	MTS and SMS Electrical procedures in place																										
	Established maintenance program for electrical equipment																										
	Switchgear is arc flash containing	✓											✓	✓												✓	
	Local control of switchgear in adjacent room or away from switchboard	✓																									
	Switchgear has reduced maintenance requirements by design	✓																								✓	
	Staff use appropriate PPE for works on site	✓																									
Equipment design	Switchgear operation to be controlled remotely whenever possible	✓																									
	Oil transformers, if used, are at distance from publicly accessible areas																										
	Limited use of oil transformers in Greenfield railway																										
	Explosion protection around oil transformer, if used			✓	✓																					✓	
	Dry type transformers commonly selected and used for Greenfield railway																										

NWRLTS-NRT-SWD-AM-REP-720672

FSA	Amendments/ improvements	A			B			C			D			E																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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Safe procedures	Backup OCC available in Bella Vista Station (BLV) when required																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									

FSA	Amendments/ improvements	A			B			C			D			E											
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Construction site safety procedures	T&C management plan Energization procedure Design standards manual Engineering standards baseline																								
	Hazard identification in the HV WRA for site management for electrical asset construction Hazard identification in the electrical commissioning events Master Risks Register for generic site safety management construction controls																	√							√

a Adjustment or modifications made by the network operator to 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 the network operator has assessed that existing assessments or risk treatments do not eliminate or reduce risk so far as is reasonably practicable.

The FSA of the MTS ENSMS workshop was conducted on 25 Jan 2019 with all the key safety measures instigated for first time as part of the ENSMS are listed in the table to address the following requirements (noting that only changes will be reported in subsequent annual performance reports):

- A. Electricity Supply (Safety and Network Management Regulation 2014 (Part 2, Division 1, Clauses 5 and 6))
 1. The safety of members of the public
 2. The safety of persons working on networks
 3. The protection of properties (whether or not belonging to a network operator)
 4. The management of safety risks arising from the protection of the environment
 5. The management of safety risks arising from loss of electricity supply
- B. Electrical Operations – Abnormal Circumstances (AS5577 Electricity Network Safety Management Systems Section 4.3.3)
 6. Operating connected to emergency power sources
 7. Operating without normal supply assets such as power lines or transformers
 8. Operating at other than normal voltage levels
 9. Operating under communication outages (local and external)
 10. Operating under changed conditions to avoid further damage to the network
- C. Electrical Operations – Electricity Hazard Areas (AS5577 Electricity Network Safety Management Systems Section A3.1)
 11. Electrical work on or near network assets
 12. Work being carried out in the vicinity of electrical assets
 13. Single and multiple failure modes
 14. Network design and operating methodologies
 15. External hazards, natural disasters (include external interference management)
 16. Intentional, unintentional human activities
- D. Electrical Activities – Electricity Hazard Areas (Electricity Network Safety Management Systems Section 4.3.2)
 17. Network planning
 18. Site safety management for work carried out in the vicinity of electrical assets
 19. Network Structural integrity
 20. Fault condition monitoring and response
 21. Change of operating conditions and remaining asset life
 22. Substation's operations and maintenance
 23. Electrical Emergency Response

E. Deviations

24. Deviations from business practices standards, codes

Table A.10 Design, construction and commissioning

Performance measure ^a	Event Count - This reporting period 2018-19	Event Count - Last reporting period 2017-18	Event Count - Two periods ago 2016-17	Event Count - Three periods ago 2015-16	Event Count - Four Periods ago 2014-15	Comments
Designs for which Safety in Design (SiD) Reports have been completed	1	0	0			EN first declared energized 23/06/17.
Designs for which Safety in Design (SiD) Reports have been audited	1	0	0			Project closeout report with contractors is due in November 2019
Contestable designs certified ^b	1	0	0			
Contestable installations reviewed ^b	1	0	0			
Project closeout reports completed	0	0	0			
Project closeout reports audited	0	0	0			

^a The unit of measure is the number of designs.

^b The network operator is to advise where no contestable designs have been performed.

Table A.11 Inspections (assets) – From First Passenger Service DD 26th May 2019

Performance measure	Inspection tasks		Corrective action tasks			Comments
	Annual target	Achieved	Tasks identified (all categories)	Open	Outstanding	
Bulk Supply Points (SMTF/CTN)	1	1	0	0	0	
Traction Substations (CB/Tx)	40	40	0	0	0	
Distribution Substations (CB/Tx)	236	236	10	7	0	Integration in Power Control System
33kV Cable Systems	0	0	0	0	0	
11kV Cable Systems	0	0	0	0	0	
125V and 48V DC battery and charger systems	196	180	0	0	0	Catch up plan is in progress
Protection Systems (inc. RTU)	0	0	0	0	0	

Note: The network operator may provide more detailed information when reporting tasks. These can be added under the headline metrics.

Table A.12 Inspections (vegetation) Aerial/Ground based

Bushfire risk category	Population (spans / poles)	Target	Achieved	Outstanding	Comments
Aerial					
(insert additional rows as required)	Not Applicable, MTS has no aerial spans / poles at 132kV, 33kV, 11kV or 415V AC				
Total					
Ground-based					
(insert additional rows as required)	Not Applicable, all MTS equipment that are within the Licensed Maintenance Area (LMA) are not near to vegetation, whereas those outside the LMA are underground cables not exposed to vegetation effect.				
Total					

Table A.13 Public electrical safety plans and activities'

Network operator public safety programs / campaigns	Details
(insert additional rows as required)	Not Applicable, MTS operates a private Electrical Network (EN) not normally exposed to the public.
a Network operator to provide details on the plans and other activities that the network operator 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 A.14 Internal audits performed on any aspect of the ENSMS (as per AS 5577^a clause 4.5.4)

Audit scope	Identified non-compliances	Actions
(insert additional rows as required)	Nil conducted in the current reporting year.	N/A
a AS 5577 is the Australian Standard <i>Electricity network safety management systems, 2013</i> , published by Standards Australia.		

Table A.15 External audits performed on any aspect of the ENSMS (as per AS 5577^a clause 4.5.4)

Audit scope	Identified non-compliances	Actions
Final Audit Report by TCFT dated 16 April 2019: Assess the extent to which MTS's current ENSMS has addressed the specific non-compliances set out in Appendix A (identified non-compliances as right	1. MTS must identify the standards and codes used by it and must document any decisions not to comply with these standards and codes and the reasons for that	1. Compliant.

<p>column) of the IPART Directive dated 14 November 2018.</p> <p>Since the above Audit, all items were Compliant except three outstanding Non-Compliant (Non-material) issues that were then addressed^{#1} given in the confirmatory Letter by MTS to IPART dated 2nd May 2019 which was before the First Passenger Service on 5 May 2019.</p> <p>#1 - See Appendix (please attach the Letter by MTS to IPART dd 2nd May 2019)</p>	<p>decision. MTS must comply with the requirements of clause 4.3.4 of AS 5577.</p> <ol style="list-style-type: none"> 2. The ENSMS must contain a description of the network, including or referencing suitable maps showing all network assets and documenting the location of associated facilities, in compliance with clause 4.1 of AS 5577. 3. MTS must ensure the description of the network includes a comprehensive asset management system and records that are suitable for operational management. 4. MTS must complete a Formal Safety Assessment that analyses risks associated with all identified electricity network hazards that could cause an electricity related incident, by undertaking a completeness check, based on the network's functional units, that compares the interactions of: <ul style="list-style-type: none"> • Identified hazards (including the loss of electricity supply) • Critical exposed groups (e.g., members of the public and persons working on networks) • Other critical exposed elements (e.g., property and the environment), and • All relevant phases (e.g., design, construction, commissioning, operations, maintenance and decommissioning), as well as abnormal and emergency situations. 5. MTS must plan and prepare for abnormal operations in accordance with the requirements of clause 4.3.3 of AS 5577. 6. MTS must include the arrangements for implementation within its ENSMS in accordance with the requirements of clause 4.1 of AS 5577. 7. MTS must identify the resourcing, equipment and material requirements for the safe operation of its network. MTS must: <ul style="list-style-type: none"> • Meet the requirements of clause 4.4.2 of AS 5577, • Identify and document the resourcing and management requirements for normal, abnormal and emergency situations, and • Identify the communication and reporting requirements for risk treatments. 	<ol style="list-style-type: none"> 2. Compliant. 3. Non-Compliant (Non-material) #1. 4. Compliant. 5. Compliant. 6. Non-Compliant (Non-material) #1. 7. Compliant. 8. Non-Compliant (Non-material) #1.
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	8. MTS must establish procedures for identifying, recording and analysing network operational, maintenance and reliability data to identify trends that may affect the safe operation of the electricity network. MTS must meet the requirements of clause 4.5.1 of AS 5577.	
(insert additional rows as required)		
a AS 5577 is the Australian Standard <i>Electricity network safety management systems, 2013</i> , published by Standards Australia.		

ATTACHMENT

LETTER BY MTS TO IPART DD 29 APRIL 2019



2nd May 2019

Ms. Christine Allen
Director
Independent Pricing and Regulatory Tribunal (IPART),
PO Box K35, Haymarket Post Shop,
NSW – 1240

Dear Christine,

Subject: Minor Non-Compliance Items Update

This letter intends to update IPART on three recommendations identified in report titled '*Limited Scope Audit of the Electricity Network Safety Management System of Metro Trains Sydney*' dated 16 April 2019.

An extract of the recommendations (R1, R2, R3) can be found in Annexure A of this letter. All recommendations were concerned with the MTS Ellipse Asset Information System.

Ellipse Asset Information System

MTS confirms that the Ellipse Asset Information System (AIS) has been implemented:

- the AIS was LIVE as of 8th April 2019.
- the AIS asset register was finalised and populated for high voltage equipment as of 2nd May 2019
- MTS maintenance staff were trained to use the AIS to perform maintenance related activities; and
- MTS is currently loading its finalised Technical Maintenance Plans into the AIS (will be completed prior to the first passenger service)

Evidence demonstrating AIS implementation can be found in Annexure B, C, D of this letter.

I trust that this update closes out MTS's obligation to inform IPART of sufficient progress with respect to the AIS. Should you wish to discuss further, do not hesitate to contact me on 0411 968 090.

Yours faithfully,

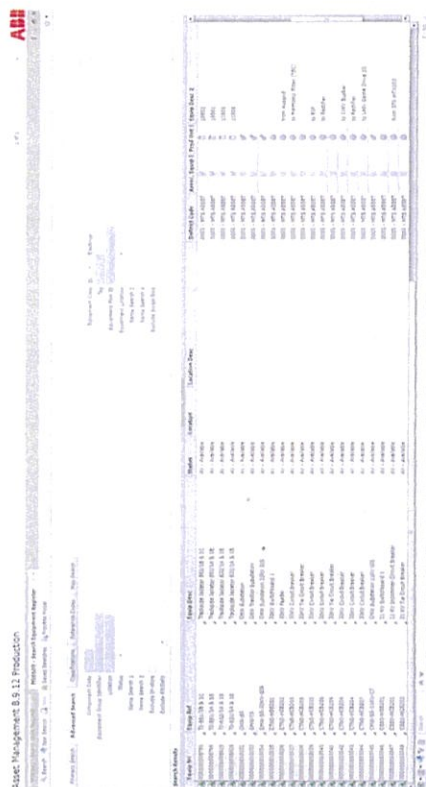


Ivan Lai

Chief Executive Officer, MTS

Annexure A:

Item No. (IPART Directive Reference)	Non-compliance	Assessed Grade	Recommendation
2 (b). (Table B.1, item 4, Last paragraph of recommendation)	MTS has not fully established a comprehensive asset management system and records that are suitable for operational management. MTS has not fully implemented procedures for identifying, recording and analysing network operational, maintenance and reliability data to identify trends that may affect the safe operation of the electricity network. MTS has not fully met the requirements of clause 4.5.1 of AS 5577.	Non-compliant (Non-material)	R1. MTS to confirm and provide appropriate evidence to IPART, prior to the first passenger train becoming operational, that the Ellipse AIS has been implemented. Alternatively, MTS to confirm and provide appropriate evidence to IPART that a contingency plan has been implemented that meets the requirements of this criteria prior to MTS assuming operational responsibility of its electrical network.
5. (Table B.2, item 1)	Implementation of the ENSMS MTS has not fully developed and included the arrangements for implementation within its ENSMS in accordance with the requirements of clause 4.1 of AS 5577.	Non-compliant (Non-material)	R2. Refer to recommendation R1 for Item 2 (b) to satisfy the requirements of this criteria.
7. (Table B.3, item 1)	Measurement and Evaluation of the ENSMS MTS has not fully established procedures for identifying, recording and analysing network operational, maintenance and reliability data to identify trends that may affect the safe operation of the electricity network. MTS has not fully met the requirements of clause 4.5.1 of AS 5577.	Non- Compliant (Non-material)	R3. Refer to recommendation R1 for Item 2 (b) to satisfy the requirements of this criteria.



Course Title	Training Attendance Sheet	Date	11/3/2019
Course Date Start	AIS101	Location	Maintenance Office
Course Date Finish		Trainer	P. McDougall

[illegible]

Annexure D – Screenshot of an example of a Technical Maintenance Plan

Technical Maintenance Plan [TMP]

TMP Template					
Asset Class	132/33/11 KV Oil Filled Transformer				
TMP ID	Basic Maintenance				
ESI Code	ESI Description				
WO Type	Maintenance	Maintenance Type	Preventive	Work Group	
Frequency	03 Years/36 months	Latitude %	5%	Classification	Standard
Duration	12 hours	Possession Required	yes	TMP Application	
Safety Requirements <ul style="list-style-type: none"> Make sure to apply proper isolation with tag out and lock out arrangements as per MTS ESR Work to be performed by HV Qualified Technician only as per MTS AEO standard 					
General Instructions <ul style="list-style-type: none"> Maintenance instructions shall strictly comply with OEM Manual. 					
Task ID	Task Description	Response	Secondary Action		
	Visually inspect transformer for corrosion and leakages		Record the results in AIS		
	Inspect and clean cable connections		Record the results in AIS		
	Performing contact resistance		Record the results in AIS		
	Inspect Temperature gauges		Record the results in AIS		
	Inspect the Silica gel in breather		Record the results in AIS		
	Perform lift and WB after removing cable connections (if required)		Record the results in AIS		
	Take oil sample for DGA and Di-electric from main tank and tap changer		Record the results in AIS		
	Inspect and clean local panels		Record the results in AIS		
Labour					
Resource Class [1]	Trade Type / Skill	Total Hours Required	Crew Size		
	HV - Authorized Person	12	02		
Materials					
Stock Code	Material Description	Manufacturer	Part No	UOM	Quantity
	Non-solvent cleaning agent			No	1
	Spray bottle			No	1
	Lint free rags			Box	1
	Standard Tool Kit			Set	01
	Oil sample bottles			No	03
	Silica Gel			KG	20
Tools & Equipment					
Equip Type		Fleet Size	UOM	Quantity	
	Torque Wrench		Set	01	
	Socket Set		Set	01	
	Vacuum Cleaner		No	01	

**BELOW ARE NOTES ARE BASIS THAT MTS USED TO COMPILE THE 2018-2019
ANNUAL PERFORMANCE REPORT ON THE MTS ENSMS AND NEED NOT BE
SUBMITTED TO IPART**

Preamble

MTS is a non-licensed Electrical Network Operator (ENO) and will comply with the Electrical Network Reporting Manuals to report all the specific obligations as expected in the IPART's Electricity Networks Reporting Manual – Safety Management System Performance Measurement, August 2018. MTS became a non-licensed ENO on 21st Mar 2017. It is also worthwhile to note that its electrical equipment, the 132kV AC feeder at the Bulk Supply Point (BSP) in the Sydney Metro Train Facility (SMTF), was first energised (declared in bulletin) on 23rd Jun 2017 at. After then the other parts of the system became live when it was built at different stages. On 5 May 2019, the system was put into functional operation when the railway had its first passenger services and on 26 May 2019 when the railway had its first public services.

Reporting Period

The reporting period of this report is from 1 July 2018 to 30 September 2019. This covers the period of the three months 1 July - 30 September 2018 that was not reported in the previous year when the annual reporting period was changed to every year commencing 1 October (instead of 1 July).

Electrical Network

MTS operates the electrical network to provide electricity to the passenger stations, ancillary buildings, traction substations for powering the building services equipment and the overhead wiring system for the running of trains. The electrical network receives electricity at two bulk transmission sources, viz., Ausgrid at Willoughby and Endeavour Energy at Rouse Hill with cable connections to MTS's Bulk Supply Points at its Chatswood North 33kV Traction Substation and SMTF 132kV Substation. Other than these two sets of transmission cables from the utilities that are installed in the public area, all the MTS Electrical Network and its associated sub-transmission and distribution equipment are installed within the Licensed Maintenance Area (LMA). MTS operates the sub-transmission and distribution network solely for the purposes of operating the Sydney Metro railway including its station facilities and traction supply. The overall schematic diagrams are given in Appendix A. All the 132kV, 33kV, 11kV and 1500V DC rail traction systems in which are shown together with the 11kV/415V distribution transformers and the rectifier transformers, rectifier and 1500V DC busbars.

Network Boundary for Reporting

The part of the Electrical Network being managed and reported by MTS in this report will include all the equipment at any nominal voltage above 415V AC and the 11kV/400V distribution transformers. Whereas that downstream equipment including the outgoing cable from the 11kV/415V transformers are treated as energy utilization equipment will not be reported here. Similarly, the 33kV/2x600V rectifier transformer and rectifier inclusive of the positive and negative pole DC cables up to the DC Switchboard will be included in this report while all the downstream 1500V DC traction system and rail traction return system will be reported to the Office of the National Rail Safety Regulator (ONRSR) and will not be repeated here in this report. An illustrative demarcation diagram is shown in Attachment X.

Purpose of this Reporting

The information provided in this Reporting form part of the aims to allow IPART to:

- determine whether MTS consistently and effectively meeting statutory obligations,
- identify immediate risks and long term trends, and
- identify trends that signify emerging issues across the industry with a view to developing safety measures or supporting industry safety initiatives where appropriate.

Equipment Count

Location (Traction or Distribution Substations)	Loc Code	132kV SWG	33kV SWG	11kV SWG	132/33k V Tx	33/11kV Tx	11/.4kV Tx	Rect. Tx	Rectifier	NER
Chatswood North	CTN/ CTS		9	10		1	2	2	2	
Lady Game Drive	LGD		6	13		1	2	2	2	
North Ryde	DLS		5	8			4	2	2	
Macquarie Park	MQP			8			4			
Macquarie University	MCV		5	8			4	2	2	
Epping Mechanical Building	EPM			8			4			
Epping Services Facility	EST		8	15		1	2	2	2	
Cheltenham Services Facility	CSF			6			2			
Cherrybrook	CHT		6	8			4	2	2	
Castle Hill	CSH			8			4			
Showground	SHW		6	8			4	2	2	
Bella Vista	BSS		6	6			2	2	2	
Kellyville	KVE			6			2			
Rouse Hill	RSH		6	6			2	2	2	
Tallawong	CUD			6			2			
Sydney Metro Train Facility	RTF		7	13		1	4	2	2	
Maintenance Building	SMTF			6			2			
Infrastructure Workshop	SMTF			6			2			
Bulk Supply Point	BSP	2	4	2	1		1			1
Total (no.)		2	68	151	1	4	53	20	20	1

Cable route length counts

Location	33kV Power Cables	11kV Power Cables	132kV Power Cables
Between Tallawong & Chatswood	5,020	60	1,200
	23,920	12,428	
	6,058	30	
	5,003	4,924	
	5,955	5,688	
	73	10,387	
	3,573	355	
	3,350	9,418	
	68	4,868	
	105	1,822	
	290	30	
	40	3,766	
	88	88	
	65	3,672	
	5,176	12,815	
	3,775	3,600	
	30	171	
	81	21	
	0	753	
	89	3,638	
	4,600		

Total route length (meters)	67,359	78,534	1,200
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Formal Safety Assessment (FSA)

Metro Trains Sydney (MTS) is an O&M Contractor under the Contract liable to North Rapid Transit (NRT) who has undertaken to construct and operate the Sydney Metro North West (SMNW) railway from Chatswood to Tallawong Stations and its depot at Sydney Metro Trains Facility (SMTF) under the Project Deed with the Transport for New South Wales (TfNSW). While MTS, upon the First Passenger Service, is to operate the railway network for 15 years, the construction works of the civil, infrastructure and systems are completed by others. The Sydney Metro (SM) as a Government division under TfNSW has been vested the asset ownership of the SMNW and ultimately responsible to the Minister and the public of the railway performance. The asset includes the private Electrical Network of the SMNW that MTS operates. As a registered unlicensed Electrical Network (EN) Operator of the EN, MTS has developed its Electrical Network Safety Management System (ENSMS) is liable to report to IPART of its performance and has to conform to IPART's reporting guideline requirement.

The SMNW Electrical Network (EN) was declared energised on 14/9/2017 when it was first connected to the Endeavour Energy source at the Rouse Hill Switching Substation at 132kV level. After then, the EN was continual built and energised progressively in 7 Commissioning Events (CE) inclusive of the first energisation to allow for the testing and commissioning of all the associated railway equipment such as rolling stock, signalling, station facilities etc. To fulfil the safety requirements of these activities, safety assurance statements of each and every commissioning event were completed to address any safety concerns of all stakeholders and properties. A Formal Safety Assessment (FSA) in two parts were also completed in early 2019. The first part was completed before the full line test running of trains while the second part was completed prior to the full line trial running of trains. All the outstanding actions in the FSA were then addressed before the First Passenger Service (FPS) on 5/5/2019. The outcomes from the FSA report with the recommendations that translate into actions to address adjustment or modifications where MTS has assessed that existing ENSMS assessment or risk treatments do not eliminate or reduce risk so far as is reasonably practicable are summarised and listed in Table A.9 in this report.

Milestone	Milestone Dates	CE	Safety Assurance Statement Document Number
Bulk Supply Commissioning at SMTF	14/09/2017	1	NWRLOTS-NRT-SWD-SA-RPT-352052
Traction SS and 11kV Distribution Network Commissioning SMTF/CUD	06/10/2017	2	NWRLOTS-NRT-SWD-SA-RPT-352054
OHW Commissioning SMTF to CUD (OHW km NW47+004)	24/10/2017	3	NWRLOTS-NRT-SWD-SA-RPT-352056
OHW Commissioning section from country end of CUD station to 45+881km (incl. SPC viaduct) (required for Train Testing), Traction SS at RSH, BLV, Distribution SS at RSH, KVE, BLV, Temporary aerial feeder 33kV/11kV line 45.650km to 44.207km	Feb 2018 to May 18	4	NWRLOTS-NRT-SWD-SA-RPT-352059
Traction Substations at Showground, Cherrybrook Distribution Substations at Showground, Castle Hill, Cherrybrook OHW from Viaduct from the Second Ponds Creek Viaduct 45+881km to 40+725km at Bella Vista	Jun 18 to July 18	5	NWRLOTS-NRT-SWD-SA-RPT-352063
Traction Substation at Epping Service Facility (ESF) Distribution Substations at Epping Service Facility (ESF) and Cheltenham Service Facility (CSF) OHW section from 40+725km at Bella Vista to 25+350km at ESF	Aug 18 to Sep 18	6	NWRLOTS-NRT-SWD-SA-RPT-352064
ECRL Electrical System Handover Traction Substations at Macquarie Uni, North Ryde-Delhi Road, Lady Game Drive and Chatswood North OHW section from 25+350 to 11+224	Dec 18 to Jan 19	7	NWRLOTS-NRT-SA-RPT-352068

