



Plan – Infrastructure, Electrical Networks

L2-ELN-PLA-003

# BUSHFIRE MITIGATION PLAN 2019-2022


Version: 10

## Approval

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## Amendment Record

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01/04/2014	1	Draft based on 2013-14 BMP
30/06/2014	2	2014-15 BMP
08/09/2014	3	MTM & ESV Consultation and associated amendments
30/06/2015	4	2015-16 BMP Submission to ESV
26/07/2015	5	MTM & ESV Consultation and associated amendments
10/11/2016	6	2016-17 BMP Submission to ESV (30/6/2016) plus corrective actions from ESV-MTM June 2 2016 BMP Audit
14/11/2017	7	2017-20 BMP Submission to ESV – revised 14 Nov 2017 pending ESV exemption submission.
11/01/2019	8	2018-21 BMP including ESV approved training requirement to inspect at-risk lines confirmed 15-10-2018 and MTM Plan Assessment by ESV 8-11-2018.
30/06/2019	9	Updated to include outcome of photo trials. Submission to ESV.
16/07/2019	10	Added REFCL status and table of works. Updated Appendix 3

	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

## **Table of Contents**


<b>1.</b>	<b>Executive Summary.....</b>	<b>3</b>
<b>2.</b>	<b>Purpose .....</b>	<b>4</b>
<b>3.</b>	<b>Scope.....</b>	<b>4</b>
<b>4.</b>	<b>Abbreviations and Acronyms .....</b>	<b>4</b>
<b>5.</b>	<b>Bushfire Mitigation Plan Particulars .....</b>	<b>4</b>
<b>6.</b>	<b>Exemption .....</b>	<b>21</b>
<b>7.</b>	<b>Availability of ESV approved MTM's Bushfire Mitigation Plan .....</b>	<b>21</b>
<b>8.</b>	<b>Reference Acts Regulations and Code of Practice: .....</b>	<b>21</b>
<b>9.</b>	<b>MTM Related Plans and Reference Documents:.....</b>	<b>21</b>
<b>10.</b>	<b>Appendices: .....</b>	<b>21</b>
	Appendix 1 - Prescribed Particulars of Bushfire Mitigation Plan .....	22
	Appendix 2 - Training Plans .....	24
	Appendix 3 - MTM Vegetation and Fire Mitigation Plans .....	26
	Appendix 4 - EN Information Sheet Overhead Wiring TMP Zone Map .....	27

## **List of Tables**

Table 1: At-risk electric line' 1.5kV DC, 22 kV & LV conductors & fittings Inspection Frequencies ..	8
Table 2: MTM Fault Priority At-risk electric line' 1.5kV DC, 22kV & LV conductors & fittings .....	9
Table 3: Service Description: Structure Inspections .....	10
Table 4: Structures supporting Electrical at-risk Lines Inspection Typical Frequencies .....	10
Table 5: Fault Category Table.....	12

## **List of Figures**

Figure 1: Typical Rail support structure for 1.5 kV DC and 22kV assets.....	8
Figure 2 Rail Substation Switchyard and Steel Rail Structures - example only.....	14

	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

## 1. Executive Summary

Metro Trains Melbourne (MTM) as a 'Specified Operator' (Operator of an at-risk electric line), is required to prepare and submit to Energy Safe Victoria (ESV), for acceptance an annual Bushfire Mitigation Plan (BMP) before 1 July each year. An 'at-risk electric line' is defined in the Electrical Safety Act 1998 as an electric line (other than a private electric line) that is above the surface of land and in a hazardous bushfire risk area (HBRA). MTM is seeking ESV approval for nominated at-risk asset inspections at time of this submission. An ESV accepted Bushfire Mitigation plan is also a key MTM Electricity Safety Management Scheme (EMSM) commitment.

MTM's Bushfire Mitigation Plan addresses the identification of at-risk electrical traction assets in MTM's HBRA and the inspection and maintenance of those assets, in compliance with the Bushfire Regulations within a 37 month program and up to 61 months in other areas. ESV approved training for asset inspectors of at-risk electric lines confirmed as UET20612 - Certificate II in ESI - Asset Inspection - 15 Oct 2018. The HBRA areas are defined by the Country Fire Authority (CFA). The BMP also outlines strategies and improvement actions, associated monitoring and auditing activities to minimise the risk of fire ignition from MTM at-risk assets.

The BMP also influences MTM's Electric Line Clearance Plan by defining Hazardous Bushfire Risk Areas (HBRA) and Low Bushfire Risk Areas (LBRA) and the Resilience Advisory Council (RAC) as a governance mechanism.

The MTM Divisional accountabilities associated with this Bushfire Mitigation plan are:-


### MTM's Infrastructure Division:

Before 1 July in each year, prepare a BMP and submit to ESV for acceptance in compliance to the Electrical Safety (Bushfire Mitigation) Regulations 2013. The plan captures:-

- Annual review of HBRA geographical areas that contain MTM's at-risk electrical traction assets based on CFA information.
- Specification of inspections and maintenance of at-risk electrical lines in HBRA that ensures that all at-risk electric lines are inspected at regular intervals of no longer than 37 months
- Strategies, actions, compliance measurement and annual performance review to continuously reduce the risk of fire ignition from MTM electrical traction assets.
- Ensure that a copy of the ESV accepted BMP is available for inspection (a) on MTM's Internet site and (b) at MTM's principal office in Melbourne during ordinary business hours.

### MTM's Infrastructure Delivery:

- Ensure electrical workers involved in electrical asset inspections and persons involved in inspection of structures supporting electrical assets in HBRA's have ESV accepted training to assess electrical equipment (refer section 5J).
- Delivery of at-risk asset inspections and corrective remedial works, in preparation for the commencement of the Victorian Bushfire Season, typically 1 November to the 31 March.

	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

## 2. Purpose

The purpose of this plan is to define the responsibilities, priorities and controls to be implemented by MTM to mitigate the risk of fire ignition in a hazardous bushfire risk areas due to the at-risk electric assets it manages and its associated operational work practices. It also describes actions to be taken to meet community, environmental and safety standards and relevant legislation, in particular the Electricity Safety Act 1998 (the Act) and the Electricity Safety (Bushfire Mitigation) Regulations 2013.

## 3. Scope

This BMP scope is to ensure that the Electricity Safety Bushfire Mitigation Regulations are met with regards to MTM's at-risk electric lines. For the purposes of this Plan, 'at-risk electric lines' means all overhead electric lines under MTM control that are within CFA declared hazardous bushfire risk areas. The defined Hazardous Bushfire Risk Area covers approximately 51km of rail network managed by Metro as illustrated in Appendix 4.

MTM also has a series of complementary fire mitigation plans referenced in Section 9: MTM Related Plans and reference documents and Appendix 3: MTM Vegetation and Fire Mitigation Plans.

## 4. Abbreviations and Acronyms

HBRA – Hazardous Bushfire Risk Area:

LBRA – Low Bushfire Risk Area

MTM – Metro Trains Melbourne

PTV – Public Transport Victoria.

Metrol – Metropolitan Trains Control Centre

INX – MTM's software platform to manage risks, corrective actions, audits & Investigations.

## 5. Bushfire Mitigation Plan Particulars

The following particulars are provided as required by Section 83BA (2) (b) of the Act and Section 6 of the Regulations:-

### a. The name, address and telephone number of the specified operator;

Name (of Organisation):	METRO Trains Melbourne
Business Address:	Level 16 700 Collins Street, Docklands VIC 3008
Postal Address:	PO Box 1880 Melbourne VIC 3001
Telephone No.:	(03) 9610 2400

**b. The position, address and telephone number of the person who was responsible for the preparation of the plan;**

Name: Ben Rotin  
 Position: Electrical Safety & Compliance Manager  
 Business Address: E-Gate, Footscray rd, West Melbourne, VIC 3004  
 Postal Address: PO Box 12894, A'Beckett St Melbourne, Vic 8006  
 Telephone No.: 03 9610 2400

**c. The position, address and telephone number of the persons who are responsible for carrying out the plan;**

Name(s): Brad Wilson  
 Position: MTM Electrical Networks Delivery Manager - Infrastructure  
 Business Address: E-Gate, Footscray rd, West Melbourne, VIC 3004  
 Postal Address: PO Box 12894, A'Beckett St Melbourne, Vic 8006  
 Telephone No.: 03 9610 2400


Name(s): Stuart Milligan  
 Position(s): MTM Facilities Delivery Manager  
 Address(s): Gate E, Footscray Rd, West Melb. Vic. 3004  
 Postal Address: PO Box 12894, A'Beckett Street Vic. 8006  
 Telephone No(s): 03 9610 2400

**d. The telephone number of the specified operator's control room so that persons in the room can be contacted in an emergency that requires action by the specified operator to mitigate the danger of bushfire;**

Emergency contact number:

Metrol – Metropolitan Train Control Centre 03 9610 7204

Metrol is responsible for enacting the emergency response procedures.

	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

**e. The bushfire mitigation policy of the specified operator to minimise the risk of fire ignition from its at-risk electric lines;**

MTM policy objective is to comply with the legislative requirements for bushfire mitigation in a cost effective manner to achieve the safety of people, care for the environment and provide effective and safe train services.

MTM aims to:

- Appropriately manage as far as reasonably practicable the risk of its at-risk electric lines contributing to fire ignitions that could harm people and/or property.
- Operate the MTM traction electrical network in a manner that will achieve compliance with the Act and Regulations administered by Energy Safe Victoria
- Enhance the rail environment.
- Develop and regularly update preventative strategies, programs, processes and procedures to support the above three aims.

**f. The objectives of the Bushfire Mitigation Plan is mitigation of bushfire risk arising from the MTM's (specified operator's) at-risk overhead electric lines;**


The following are identified as the key objectives of this plan:

- Public Safety;
- Safety of employees and contractors;
- Safety of MTM and third party assets.
- Continuity of train services.
- Risk Mitigation of ignition of fire from at-risk electric lines.
- Compliance with relevant legislation both environmental and electricity safety.
- Continuity of electricity supply
- Community satisfaction with the manner in which the necessary works are carried out.
- Monitoring and continuous improvement of bushfire risk mitigation.

**g. A description, map or plan of the land to which the bushfire mitigation plan applies, identifying the location of the specified operator's at-risk electric lines;**

The declared hazardous bushfire risk areas containing MTM Overhead Electrical assets were determined based on CFA maps that identify the Bushfire risk areas, the geographic representation of MTM assets in HBRA in relation to their location refer Appendix 4. A review in 2018 identified no changes in HBRA areas covering MTM Rail assets. Note: To mitigate the risk of the identification of specific assets in declared HBRA boundaries, the HBRA areas have been extended to the nearest rail Station or Electrical Substation structure in Appendix 4.



	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

**h. The preventative strategies and programs to be adopted by the specified operator to minimise the risk of the specified operator's at-risk electric lines starting fires;**

The 'at-risk electric line' for the MTM Rail Network involve 1500 V DC low voltage traction 'train pantograph contact cables' and fittings, one MTM substation switchyard at Upwey, the MTM Ferntree Gully to Upwey high voltage 22 kV overhead feeder (nominated as 22/34), MTM lighting overhead cables within rail car parks in HBRA and associated rail support structures.

In January 2015, MTM introduced a strategy to mitigate as far as reasonably practicable the risk of the 22 kV 22/34 supply line initiating or contributing to a Bushfire event by de-energisation of 22/34 during declared Fire Ban and Code Red Days. Refer L2-ELN-WOI-002 MTM Bushfire Mitigation Procedure Disconnection and Reconnection of 22 kV FDR 22/34.

There are currently works scheduled to relocate the entire 22/34 overhead feeder between Ferntree Gully and Upwey. Once these works are complete, there will be no further requirement to de-energise 22/34 on Fire Ban and Code Red Days. The expected completion of these works are at the end of 2021.

In some situations bushfire mitigation strategies such as undergrounding or insulating overhead 1500V DC contact cables are not applicable due to a requirement for rail pantograph contact. MTM bushfire prevention works focus on uninsulated 1500 V DC involves at-risk asset inspections within regulatory inspection requirements, associated remedial maintenance works and vegetation clearance.

Note: additional risk mitigation strategies may also be stated in MTM's Fire Prevention and Preparedness Planning 2017-18. For example on a declared Code Red Day Metro Trains will not staff any stations, run train services or provide replacement buses in defined areas as a minimum.

MTM may also enact further station closures and service suspensions if required under the emergency situation or if conditions change or likely to change that would put staff or passengers at risk.

Metropolitan Trains Control Centre – Metrol is responsible for enacting the emergency response procedures including measures to provide protection to all people on site, this may include overhead electrical asset de-energization in addition to stopping all train services and advising emergency services; Police, Fire and Ambulance Services.

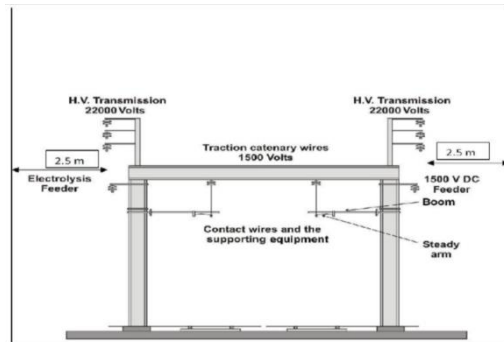
**i. A plan for inspection that ensures that all of the specified operator's at-risk electric lines are inspected at regular intervals of no longer than 37 months;**

MTM manages approximately:-

- 830km of track (and approximately the same length of 1.5 kV DC overhead wiring);
- Electrical reticulation poles and street lighting poles.

The majority of MTM rail electrical assets are supported by steel traction infrastructure (example Fig 1). The electrical assets and support fittings are inspected by MTM Electrical Lineworkers. The integrity of support structures both poles and steel traction assets are inspected under contract managed by MTM's Structures and Facilities Division.





**Figure 1: Typical Rail support structure for 1.5 kV DC and 22kV assets**

## At Risk Electrical Asset inspections


Electrical asset walking Inspections of overhead assets are carried out on MTM's at-risk electric lines as defined in MTM's L2-ELN-SCH-216 Scheduled Walking Examinations for Hazardous Bushfire Areas and L2-ELN-SCH-204, 22 kV aerial (overhead) asset examinations

The inspections involve at-risk overhead electrical asset inspection in HBRA's for both Low voltage (1.5 kV DC) and high voltage (22 kV assets). MTM's Inspection frequencies comply with Bushfire Mitigation regulation frequencies as shown in the following summary tables:-

**Table 1: At-risk electric line' 1.5kV DC, 22 kV & LV conductors & fittings  
Inspection Frequencies**

Description	Scheduled Frequency
High Voltage 22kV Aerial Walking Examination Visual ground based electrical asset inspection:- Aerial Lines; Vegetation, Insulators, Structures & Switches. MTM Ref Doc L2-ELN-SCH-204	12 m +/- 2 month.  Regulatory frequency requirement for reference: less than 37 months
Low Voltage 1.5 KV Walking Inspections HBRA  Visual ground based electrical asset inspection: Traction contact cable and associated fittings. MTM Reference Doc. L2-ELN-SCH-216	36 months (+/- 1 month).  Regulatory frequency requirement for Reference: less than 37 months

Maintenance and repair of overhead line assets are scheduled as part of MTM's maintenance program. This involves walking inspections/observations of MTM overhead lines which are carried out by MTM's Infrastructure maintenance lineworkers with ESV approved qualifications. The assets inspected include cross-arms, insulators, conductor, spark gaps and switches and associated line hardware. Defects identified are then captured and prioritized in MTM's corrective work order data base.

	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

**Table 2: MTM Fault Priority At-risk electric line' 1.5kV DC, 22kV & LV conductors & fittings**

Priority	Action	Definition
P1	To be rectified within 24hrs.	Likely to cause issues. If almost certain, Linesman is to escalate to Supervisor for immediate action.
P2	To be rectified within 3 months	Can possibly cause issues. Might occur at some time.
P3	To be rectified within 365 days	Is unlikely to cause issues, but may occur in exceptional circumstances.

The walking at-risk asset condition inspections also include:-

In-span Wiring: - examine contact wire, catenaries and aerial feeder wires, paying attention for example to: Sagging or low wire, damaged insulators missing/damaged droppers. MTM compliance requirements are defined in L2-ELN-MAI-020 Walking Examination (Bushfire Areas) and L4-ELN-FOR-032 Inspection form.

MTM Infrastructure overhead crews will be undertaking both high voltage and low voltage aerial asset inspection in HBRA for completion and fire risk rectification in preparation for the 2019-20 Bushfire Season.

The photo trial concluded, with MTM opting to not adopt this as business as usual practice. There were a lot of factors considered, including but not limited to – environmental factors (lighting issues), operator capability and equipment. What was observed was the photos were of an inconsistent quality and couldn't provide the clarity that was envisaged. Traditional methods will continue to be utilised to complete and document the status of the infrastructure.

### **At Risk Electrical Asset Support Structure inspections**


MTM inspections also address the integrity of structures that supports the at-risk assets electrical assets. Support structures are considered to be any structure supporting the 1.5kV and 22kV, catenary and rail contact wires and the guy wires that anchor structures.

The type of inspections:

**Above Ground Line Inspection:** Looking from the ground line to the top of the pole,

**Below Ground Inspection:** are to occur at all structures that are directly buried and that show signs of significant deterioration at ground level through visual inspections.

**Internal Inspection:** to occur when an inspection plate is present on the pole.

	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

**Table 3: Service Description: Structure Inspections**

Inspection Type	Description	Competency
Observation	Visual Observation of non-structural elements	MTM Staff
Structural Level 1	Visual Inspection	Structures Inspector/Engineer
Structural Level 2	Detailed Visual Inspection	Structures Inspector/Engineer
Structural Level 3	Engineering Assessment - Structural Investigation and/or Structural Monitoring	Structural Engineer
Special	Visual Inspection following an incident.	Structural Inspector/Engineer

**L1 Visual Inspection** Routine inspection of a structure performed from the ground using the naked eye or hand held visual aids. The L1 inspection is performed without affecting normal train services. Visual Aids: Binoculars, Cameras or video equipment including pole mounted


**L2 Detailed Visual Inspection** Visual inspection and assessment of structural elements performed from the ground including condition rating, recording of key measurements and non-intrusive testing with the exception of wooden pole drilling works. The L2 inspection is performed without affecting normal train services.

**L3 Engineering Assessment:** Detailed engineering investigation of a structure involves recording key measurements, mechanical access aids and intrusive testing. The L3 inspection includes Load Rating, Materials Testing, Fatigue Assessments or other tests.

**Special Inspection:** Special Inspections are performed following an incident (such as a bridge hit by road vehicle) to assess any damage that may have occurred. These inspections are performed by MTM Structures staff qualified to perform these inspections. Frequencies of structure inspections are shown in Table 4.

**Table 4: Structures supporting Electrical at-risk Lines Inspection Typical Frequencies**

Asset Class	Asset material	Service Description	Frequency /Tolerance
Electrical Distribution, Service and Lighting Poles	Concrete	L1 Visual Inspection	2 years/ ± 12 months
	Steel		
	Wood	L2 Detailed Visual Inspection	2 years/ ± 12 months
Overhead Rail Structures  Supporting 1.5kV and 22kV DC Assets	Steel	L1 Visual Inspection	6 to 12 months /± 30 days. Tolerance subject to track access.
		L2 Detailed Visual Inspection	3 to 6 Yearly/± 90 days
* Regulatory frequencies for pole inspections 'less than 36 months in HBRA and 60 months LBRA.			

	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

The MTM Pole Inspection Procedure L2-STF-PRO-008 defines the method by which the Pole Inspections are completed. This Procedure is performed at the frequency as defined in the Technical Maintenance Plan – Structures & Facilities (L2-STF-PLA-003).

Pole Inspection checklist for inspectors are provided for Wood, Steel and Concrete poles for example L4-STF-FOR-037 MTM Pole Inspection Form for Concrete Poles. These templates and procedure supports a consistent inspection process for both Structure Inspector within MTM Structure & Facilities or a contractor engaged by the Facilities Delivery Manager or delegate..

In addition for wooden pole inspections a specified number of onsite inspections of pole testing work practice against defined inspection criteria (including excavation and drilling works) will be undertaken. MTM required qualifications and competency refer section j.

### **Poles Condition Assessment Guidelines**

The following guidelines are provided to assist the Structures Inspector to assess the condition state of poles.

#### **Serviceable:**

Condition State 1: The pole is in As-New condition showing no signs of deterioration or defects and is fit for service until the next programmed inspection.

Condition State 2: The pole shows minor signs of deterioration that are not yet considered defects warranting treatment. The pole will not require remediation in the foreseeable future.

#### Condition State 3:

The pole shows signs of deterioration, which may require intervention to maintain the life expectancy dependent on asset management strategy. Permanently reinforced poles (reinforced steel stakes around the timber poles) are considered to be in this Condition State until their condition changes.

#### Condition State 4:

The pole shows advanced signs of deterioration that indicate the pole has limited service life remaining or has an active unexpected deterioration condition that requires intervention, e.g. timber pole with active termites. Remediation works may be required before the next scheduled inspection or 2 years whichever is the greater; or where a change in the inspection type or frequency is required.

#### **Condemned:**

#### Condition State 5:

The pole is in a condition where it is no longer serviceable and there is a risk to its functional performance and safe operation prior to the next inspection. A specific management plan shall be implemented or the pole shall undergo further assessment by a qualified engineer for final approval.

Any new installation must be in Condition State 1 or 2, unless approved by the Structures Maintenance Manager.

**Table 5: Fault Category Table**

(Reference Structures & Facilities Technical Maintenance Plan (L2-STF-PLA-003))


Fault Category	Initial Response Time	Categorisation Basis	Example	Typical Course of action
U	Make Safe <4hrs and Rectify <48hr	The defect poses an immediate risk to the safe operations of the railway, its staff and / or public or significant impact on operational performance	The asset could collapse / fail if action is not taken immediately Unplanned line closure	<ul style="list-style-type: none"> <li>Temporary Speed Restriction</li> <li>Stop Trains</li> <li>Temporary repair to make the asset safe</li> <li>Permanent repair, and/or undertake detailed assessment / investigation</li> </ul>
P1	<=7 days	The defect affects the acceptable safety or performance	The capacity or functionality of the asset is reduced which affects the safety or performance	<ul style="list-style-type: none"> <li>Temporary Speed Restriction</li> <li>Complete remedial works.</li> <li>Undertake further investigations and/or assessment.</li> </ul>
P2	<=28days	The defect has the potential to affect safety and performance	No reduction in the performance of the asset. Safety of the structure is affected	<ul style="list-style-type: none"> <li>Complete remedial works.</li> <li>Undertake further investigation and/or assessment.</li> </ul>
P3	<=90 days	The defect may have the potential to affect safety and performance	No reduction in safety or performance. Condition of the asset will be affected.	<ul style="list-style-type: none"> <li>Complete remedial works.</li> <li>Undertake further investigation and/or assessment.</li> </ul>
P4	Review at next programmed inspection	The defect exists and is unlikely to deteriorate prior to next programmed inspection. Lead time to repair may require management plan to be implemented prior to next inspection.	No reduction in safety or performance.	<ul style="list-style-type: none"> <li>Specific review of condition at next scheduled inspection.</li> </ul>

**Notes:**

The initial response time is the time in which the Fault must be investigated, temporary / permanently repaired, or further course of action determined.

A fault may be re-categorized following initial investigation or a management plan maybe put in place to extend the timing of the permanent repair.



	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

- j. **Details of the processes and procedures for ensuring that each person who is assigned to carry out the inspections referred to in paragraph (i) has satisfactorily completed a training course approved by Energy Safe Victoria and is competent to carry out such inspections;**

☐ **HBRA At-risk line inspection program inspector competency**

Training requirement for undertaking inspection of MTM overhead electrical lines in HBRA (MTM at-risk lines) is ESV approved UET20612 - Certificate II in ESI - Asset Inspection training which may include recognition of prior learning (RPL) by suitably registered training organizations(RTO), unless training otherwise approved by ESV.

The MTM Overhead Training Officer will provide a list of MTM approved Lineworkers that meet the requirement and are competent in identifying overhead asset defects. Lineworkers in training involved in at-risk electrical asset Inspectors may work under the supervision of an approved Lineworker.

If there are no approved Lineworkers with the Cert II in ESI – Asset Inspection qualification, a third party shall be engaged with the suitable qualifications. The Lineworker will accompany the third party as a Subject Matter Expert and assist with the inspection.

The Infrastructure Electrical Networks Delivery Manager will approve the Lineworkers undertaking the inspection task from the list provided.

The Lineworker will also need to demonstrate compliance to asset defect capture in accordance with requirements defined in L2-ELN-MAI-020 Walking Examination (Bushfire Areas) and L4-ELN-FOR-032 Inspection form and asset photo capture.

MTM Safe Work Method Statement for Walking Examinations in High Risk Bushfire Areas (SWMS –ELN-OH-047) requires the Site Supervisor to ensure the inspection is undertaken by qualified MTM Traction Electrical Lineworker with a minimum 2 years O/H maintenance experience.

MTM has introduced high resolution binoculars and cameras as support tools to provide a more detailed evaluation of overhead HV line asset condition and photo capture of assets at time of inspection.


☐ **HBRA Pole and Rail Structure (Fig 1) Inspector Competency**

Training requirement for Pole Inspectors undertaking inspection of MTM Wood, Steel Concrete Poles supporting overhead electrical lines in HBRA (MTM at-risk lines) is ESV approved UET20612 - Certificate II in ESI - Asset Inspection training which may include recognition of prior learning (RPL) by suitably registered training organizations(RTO), unless training otherwise approved by ESV.

If there are no Inspectors with the Cert II in ESI – Asset Inspection qualification, a third party shall be engaged with the required qualifications. The Inspector will accompany the third party as a Subject Matter Expert and assist with the inspection.

Personnel undertaking the structures inspector role will be inducted in MTM L2-STF-008 Pole Inspection Procedure and appointed by the Facilities Delivery Manager. The condition of appointment being ESV approved training and demonstrates competence in completing Pole Inspection forms and asset photo capture.



	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

□ **HBRA Upwey Switchyard At-risk line Inspector Competency**

Training requirement for Inspectors undertaking inspection of MTM Substation switchyards supporting overhead electrical lines in HBRA (MTM at-risk lines) is ESV approved UET20612 - Certificate II in ESI - Asset Inspection training which may include recognition of prior learning (RPL) by suitably registered training organizations(RTO), unless training otherwise approved by ESV.

If there are no Inspectors with the Cert II in ESI – Asset Inspection qualification, a third party shall be engaged with the required qualifications. The Inspector will accompany the third party as a Subject Matter Expert and assist with the inspection.



**Figure 2 Rail Substation Switchyard and Steel Rail Structures - example only**

□ **HBRA Steel Rail Structure (Fig 1) Inspection Competency.**

Training requirement Inspectors undertaking inspection of MTM Steel Rail Structures supporting overhead electrical lines in HBRA (MTM at-risk lines) is ESV approved UET20612 - Certificate II in ESI - Asset Inspection training which may include recognition of prior learning (RPL) by suitably registered training organizations (RTO), unless training otherwise approved by ESV.

If there are no Inspectors with the Cert II in ESI – Asset Inspection qualification, a third party shall be engaged with the required qualifications. The Inspector will accompany the third party as a Subject Matter Expert and assist with the inspection.


The above training certifications to be compliance audited as part of MTM Bushfire Mitigation Safety Environment and Risk (SER) compliance audit.

A training plan is attached in Appendix 2 and outlines the interim measures MTM has taken to ensure compliance and a roadmap to have suitably qualified personnel complete the Inspections as required.

**k. Details of the processes and procedures for ensuring that persons (other than persons referred to above) who carry out or will carry out functions under the plan are competent to do so;**

MTM employees and contractors undertaking bushfire mitigation work other than asset inspectors (as defined in section j), for example auditors and incident investigators to comply with the following procedures and processes:-

**Auditors:** All MTM audits shall be conducted by personal who:

	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

- Have successfully completed an ISO 9001 (2 day) Internal Auditor course or equivalent. All MTM Auditors Leading an Audit Team (Lead Auditor) shall have successfully completed an ISO 9001 (5 day) Lead Auditor course or equivalent;
- Be independent from the area audited to the maximum extent that is practicable;

MTM SER Manager appointing the Audit / Inspection Team shall confirm competencies which will be captured in the Audit report. Reference L0-SQE-PRO-044 MTM Management of Internal Audits and Inspections.

Experienced technical persons competent to the level required and/or subject Matter Experts (SME's) based on extensive experience in the industry could be required to support these inspection. MTM Auditors involved in Bushfire Mitigation shall be briefed and /or provided access to this MTM Bushfire Mitigation Plan.

#### **Arborists and Tree clearance Crew Qualification**

MTM engages a Vegetation Management Company: Eastern Tree Services (ETS) for tree clearance inspection and clearance works under contract.

VMC Arborist to have:

- (a) National Certificate Level IV in Horticulture and Arboriculture qualification, including the "Assess Trees" module, or an equivalent qualification; and
- (b) At least 3 years or under supervision of a certified and experienced Arborist

The VMC personnel are required to have current training based on functions preformed (i.e. ground crew, inspections or EWP operation). Eastern Tree Services (ETS) provide a Skills Query report to support refresher training compliance for Arborists and Tree Clearing crews. ETS also undertake training compliance inspections on their work sites. Compliance results are reviewed as part of MTM/VMC contract performance meeting. MTM (SER) also undertakes contractor employee competency audits to validate training records compliance.

#### **I. The operation and maintenance plans for the specified Operator's at-risk electric lines:**

- In the event of a fire;

MTM's Emergency and Crisis Management Plan, has been developed in consultation with key internal and external stakeholders including external Emergency Services.

MTM is deemed as a Support Agency in relation to Emergency Management. Within the plan MTM's response is dependent on the incident level, for example:-

##### Level 1 Incident


A Level 1 incident is characterised by being able to be resolved through the use of local or initial response resources only.

##### Level 2 Incident

A Level 2 incident is a more complex emergency response, either in size, resources or risk. As a guide this would include the following types of incidents:

- A fire on any part of the network (except MURL).

Approving Manager: General Manager Infrastructure	Approval Date: 31/10/2019	Next Review Date: 22/02/2022
PRINTOUT MAY NOT BE UP-TO-DATE; REFER TO METRO INTRANET FOR THE LATEST VERSION		Page 15 of 27

	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

- Potential for serious injury or harm to persons.
- Significant damage to property or infrastructure.

The Crisis Management Team and MTM's Incident Control Centre may be activated for this level of incident. The Chief Operating Officer or Head of Operational Rail Safety will facilitate a conference call to update key staff on the situation.

### Level 3 Incident

A Level 3 incident is characterised by degrees of complexity that may require a more substantial establishment for management of the situation. These emergencies will usually involve delegation of all incident management functions. MTM's Incident Control Centre to be utilised for this level of incident. As a guide this would include the following types of incidents:

- An incident requiring a sustained response by Emergency Services or other control agencies
- Fire/Smoke in the MURL

The role of MTM's Crisis Management Team will be one of support to the agencies such as SES, CFA, MFB and Victorian Police, including matters relating to traction electricity supply and security.

If a disaster is declared and roadblocks erected, MTM operational personnel must not enter into restricted areas. Arrangements may be agreed between the Fire/Disaster Coordinator and MTM's Crisis Management Team to enable operations approval to enter the restricted area. This agreement must hold the safety of personnel paramount and personnel involved must be consulted and their agreement to the arrangements confirmed before entry is undertaken.

### During a total fire ban day; and during a fire danger period:

Rail services may continue on fire ban days, however, speed restrictions, CFA hot work permits and a review of work plans would apply. Also refer

### MTM L2-SQE-PLA-004 Fire Prevention and Preparedness Plan 2018-19

- Section 8.4 Permits and Authorities
- Section 8.5 Precautions and Restrictions - Days of Total Fire Ban

MTM electricity supply is provided by Electrical Network Companies. On Fire Ban days and Code Red Days supply restoration could be delayed due to restrictions on Auto Re-closures. MTM has developed contingencies to avoid the potential of stranded trains from loss of a network supply. PTV also has a Summer Season Preparation Plan including in 2015-16 Code Red Day Rail Service restrictions impacting MTM rail services.

### Network Contingency Plans & Strategies

A specific plan has been developed for the high voltage overhead line that runs in the HBRA's between Ferntree Gully Substation and Upwey Substation previously referred to as 22/34, which involves de-energising and restoration of this back-up supply line during Code Red and Total Fire Ban periods. Details of the procedure can be found in: L2-ELN-WOI-002 Bushfire Risk Mitigation Disconnection and Reconnection of 22kV FDR 22/34

In the event of a fire, MTM's Crisis Management Team may also institute strategies and contingency plans to restrict rail services, prevent asset damage or provide resources for post fire recovery activities.

Typically these include the following;

- Consideration of remotely switching off Electrical HV lines due to the risk of electrical flashover caused by smoke,
- Patrols of 22kV and 1.5 V DC of electrical assets before restoration of supply,
- Dispatching of operational crews to confirm asset security after fire front passes in accordance with SES, CFA, MFB and Victorian Police access restrictions.
- MTM's disaster recovery of significant asset damage associated with a bushfire will be addressed through redirection of current resources and material and staging of restoration work to progressively return services to normal which includes ;
  - Labour both internal and contract support
  - Materials emergency and redirection of equipment assigned to Projects
- During restoration of rail services Metro may introduce extended bus services to address asset procurement and restoration work.

**m. The investigations, analysis and methodology to be adopted by the specified operator for the mitigation of the risk of fire ignition from its at-risk electric lines**

**(i) Methodology: MTM Fire Prevention & Preparedness Plan (L2-SQE-PLA-004)**


The principle objective of fire prevention at Metro is to minimise the risk of ignition and spread of fires on the Metro network through the following actions:

- Maintain vegetation clearances around electrical network assets.
- Identify and manage bushfire hazards elsewhere in the infrastructure leased areas within the rail reserve.
- Control vegetation growth on infrastructure leased land to a standard consistent with that required by the local municipality or other landowner.
- Liaise with the CFA, MFESB, DELWP and municipal Fire Prevention Officers, to identify and agree on necessary actions to attend to other identified bushfire hazards, within the availability of funds and resources.
- Analyse fire incident reports, inspection reports and audit findings to identify trends and high risk areas.
- Annual inspections of at-risk electric lines

Fire incidents are investigated in accordance with MTM L1-SQE-PRO-005, Incident Reporting and Investigation. The purpose of the procedure is to define the requirements for incident reporting and investigation of any incident affecting the safety of persons, property or railway operations and that have caused, or have the potential to cause, injury, illness, damage and/or property loss on Metro Trains Melbourne (MTM) premises.

**(ii) Audits**

The Manager - Audit and Assurance (SER) in consultation with Infrastructure and other departments shall schedule and undertake inspections and audits of the network to ensure compliance with this plan. The Fire Prevention Officer will collate the results of

	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

the audits and in consultation with Infrastructure, use them to set priorities for preventative and reactive works.

a. Industry audits – prior to commencement of fire season

Prior to commencement of the declaration of the fire season, Energy Safe Victoria (ESV) and Public Transport Victoria may carry out a major bushfire mitigation audit of Metro.

(iii) Risk Management

Metro applies a risk-based approach to bushfire management planning. Risks associated with bushfire are identified and managed in accordance with the Metro Enterprise Risk Management Procedure – L0-SQE-PRO-031. In general, assessing the bushfire risk in rail reserves includes an assessment of:

- The level of vegetation fuel
- The position of fuel in the rail corridor
- The proximity of assets

(iv) Analysis

An analysis of inspections of at-risk asset and associated support structures will be undertaken in 2018-19 to assess 3 yearly inspections.

Incident investigations in 2018-19 will be undertaken for electrical assets failures or contact with electrical assets (non-asset failures) resulting in grass /vegetation fire for Traction low voltage 1.5 kV DC and high voltage 22kV AC assets.

(v) Accountability

The Metro Manager Business Resilience is the designated franchise Fire Prevention Officer and is responsible for maintenance and oversight of Metro's Fire Prevention Plan. This applies to all of Metro's Metropolitan franchise operations, infrastructure and rolling stock, including works undertaken and is responsible for obtaining CFA and MFB permits prior to commencement of the fire Danger Period.

**n. Details of the processes and procedures by which the specified operator will monitor the effectiveness of the plan**

i. System Audits and Inspections

MTM Senior Management will monitor the Bushfire Mitigation works readiness program through periodic internal and external audits

System audits shall be conducted in accordance with MTM internal procedures (refer (section k). The Metro nominated Auditor/s shall have or exceed a competency level of 2 years experience in auditing and possess a recognized Internal or Lead Auditor SAI Global qualification or equivalent and have electrical reticulation experience or support from an electrical subject Matter Expert/s (SME).

The Audits and inspection include Bushfire Mitigation Plan regulatory compliance.


Deficiencies identified in the plan to be addressed through corrective actions and timeframes captured in MTM INX.

ii. MTM monitors bushfire mitigation works program through the following:

- MTM Electric Line Clearance and Bushfire Mitigation Plan

Approving Manager: General Manager Infrastructure	Approval Date: 31/10/2019	Next Review Date: 22/02/2022
PRINTOUT MAY NOT BE UP-TO-DATE; REFER TO METRO INTRANET FOR THE LATEST VERSION		Page 18 of 27



	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

- Monthly VMC reports: Tree clearance regulatory compliance statistics.
- Asset inspection and maintenance plans for at-risk lines in HBRA's

iii. Bushfire Mitigation plan – Monitoring

Continuous improvement of the MTM Bushfire Mitigation Plan is achieved through:

- The Post Fire Season Review, held at the end of the fire danger period to review MTM performance under the plan.
- The Summer Pre-Season Briefing, held before the start of the 2018/19 fire declaration period. With the aim clarify accountabilities and performance measures and plan contingencies, if the need arises, to meet the requirements of the plan.

**o. The policy of the specified operator in relation to the assistance to be provided to fire control authorities in the investigation of fires near the specified operator's at-risk electric lines.**

The role of MTM's Crisis Management Team will be one of support to PTV and agencies such as SES, CFA, MFB and Victorian Police including matters relating to traction electricity supply and security.

MTM's provides assistance and information sharing with fire control authorities in the investigation of fires near MTM's at-risk electric lines and electrical lines in HBRA's

PTV Section 7 of the Emergency Management Manual of Victoria (EMMV) states that Public Transport Victoria (PTV) is the control agency for transport incident management and responsible for effectively managing contractual and regulatory relationships with METRO Trains, V/Line Passenger, Yarra Trams, and bus operators.

The PTV is responsible for coordination of Prevention / Response / Relief / Recovery Activities within the Transport Sector as follows:


- Support agency, in collaboration with the Department of Transport, Planning and Local Infrastructure (Emergency Risk and Resilience), providing immediate assistance in coordination of all private rail, tram, and bus organisations related to emergencies involving loss of life, injury to persons, fire, hazardous chemical accidents, general policing incidents and other major emergencies.
- Provide and facilitate professional and skilled engineering and technical emergency teams/experts, equipment and material to other emergencies from either PTV or the private companies as appropriate.
- Coordinate with the private owners the provision of alternative transport for the duration of the emergency and restoration of normal services.
- Managing partnership agreements for the provision of safe and reliable train and tram services and managing contracts for the provision of safe and reliable route bus, school bus and French Island–Philip Island ferry services
- Monitoring and reporting on the performance of public transport operators
- Auditing of rail easement fire mitigation programs.



## p. REFCL – Rapid Earth Fault Current Limiter

MTM are currently undertaking works at 8 sites across the network, installing isolation transformers and associated switchgear to become REFCL ready. Once further works have been confirmed by the Department of Transport, MTM will update ESV as to the works delivery. Please see the below table for the current schedule of works:

MTM Substation	Line	Distributor – REFCL ZSS	Tranche / Distributor REFCL deadline	HV Customer (Department of Transport) Readiness Date
Lilydale (LIL)	LIL	AusNet Services – Lilydale	Tranche 2 / 1 May 2021	31 <sup>st</sup> July 2021
<i>*Mooroolbark (MLK)</i>		<i>*MLK will switch to AusNet Services – Non-REFCL Croydon ZSS</i>		31 <sup>st</sup> July 2021
Ferntree Gully (FTG)	Belgrave (BEG)	AusNet Services – Ferntree Gully		31 <sup>st</sup> October 2021
Upwey (UPW)		AusNet Services - Belgrave		30 <sup>th</sup> November 2021
Wattle Glen (WTT)	Hurstbridge (HBE)	AusNet Services – Eltham		To be confirmed
Eltham (ELT)				To be confirmed
Montmorency (MMY)				To be confirmed
Coolaroo (CLO)	Craigieburn (CGB)	<b>Primary</b> supply to CLO is from Jemena’s – Broadmeadows Non-REFCL ZSS  <b>Secondary</b> supply to CLO is from Jemena’s Coolaroo REFCL ZSS	Tranche 3 for Jemena Coolaroo REFCL ZSS / 1 May 2023	To be confirmed
Roxburgh Park (RXP)		Jemena Coolaroo REFCL ZSS		To be confirmed

	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

## 6. Exemption

No exemption requested.

## 7. Availability of ESV approved MTM's Bushfire Mitigation Plan

Availability Details:-

Business Address: Level 16 700 Collins Street, Docklands VIC 3008

Postal Address: PO Box 1880 Melbourne VIC 3001

Telephone No.: (03) 9610 2400

Office Hours 9:00 am -5:00 PM Mon- Fri: excluding public holidays

MTM's Internet Site [METROtrains.com.au](http://METROtrains.com.au): (Refer: Contact US Section)

## 8. Reference Acts Regulations and Code of Practice:

Electricity Safety Act 1998

Electricity Safety (Bushfire Mitigation) Regulations 2013

Electricity Safety (Electric Line Clearance) Regulations 2015

Electric Line Clearance Code of Practice 2015

## 9. MTM Related Plans and Reference Documents:

L2-INF-PLA-001 Electric Line Clearance Plan 2018-21

L4-ELN-FOR-032 EN Form Walking Examination (Bushfire Areas)

L2-ELN-MAI-020 Maintenance Instruction Walking Exam. (Bushfire Areas)

L0-SQE-PRO-044 MTM Management of Compliance Activities

L2-STF-PRO-008 MTM Pole Inspection Procedure

L2-STF-PLA-003 Technical Maintenance Plan – Structures & Facilities

L4-STF-FOR-037 Pole Inspection Template – Concrete Poles

L4-ELN-INF-007 Overhead Wiring TMP Zone Map

L0-SQE-PRO-031 Enterprise Risk Management Procedure


## 10. Appendices:

Appendix 1 - Prescribed Particulars of Bushfire Mitigation Plan

Appendix 2 - Rail Inspection Competencies (or equivalent).

Appendix 3 - MTM Vegetation and Fire Prevention Plans


Appendix 4 - EN information Sheet Overhead Wiring TMP Zone Map

	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

## Appendix 1 - Prescribed Particulars of Bushfire Mitigation Plan

No	Regulation	<b>Electrical Safety (Bushfire Mitigation) Regulations 2013</b> <b>Prescribed particulars for bushfire mitigation plans—specified operators</b>	BMP Reference
1	6 (a)	Name, address and telephone number of the specified operator;	Section 5 (a) Page 4
2	6(b)	Position, address and telephone number of the person who was responsible for the preparation of the plan	Section 5 (b) Page 5
3	6 (c.)	Position, address and telephone number of the persons who are responsible for carrying out the plan;	Section 5 (c ) Page 5
4	6 (d)	The telephone number of the specified operator's control room so that persons in the room can be contacted in an emergency that requires action by the specified operator to mitigate the danger of bushfire	Section 5 (d) Page 5
5	6 (e)	The bushfire mitigation policy of the specified operator to minimise the risk of fire ignition from its at-risk electric lines;	Section 5 (e) Page 6
6	6 (f)	The objectives of the plan to achieve the mitigation of fire danger arising from the specified operator's at-risk electric lines;	Section 5 (f) Page 6
7	6 (g)	A description, map or plan of the land to which the bushfire mitigation plan applies, identifying the location of the specified operator's at-risk electric lines;	Section 5 (g) Page 6
8	6 (h)	Preventative strategies and programs to be adopted by the specified operator to minimise the risk of the specified operator's at-risk electric lines starting fires	Section 5 (h) Page 7
9	6 (i)	A plan for inspection that ensures that all of the specified operator's at-risk electric lines are inspected at regular intervals of no longer than 37 months;	Section 5 (i) Page/s 7-12
10	6 (j)	Details of the processes and procedures for ensuring that each person who is assigned to carry out the inspections referred to in paragraph (i) has satisfactorily completed a training course approved by Energy Safe Victoria and is competent to carry out such inspections;	Section 5 (j) Page/s 13-14
11	6 (k)	Details of the processes and procedures for ensuring that persons (other than persons referred to in paragraph (j)) who carry out or will carry out functions under the plan are competent to do so;	Section 5 (k) Page/s 14-15

	Regulation	Electrical Safety (Bushfire Mitigation) Regulations 2013 Prescribed particulars for bushfire mitigation plans—specified operators	BMP Reference
12	6 (l)	The operation and maintenance plans for the specified operator's at-risk electric lines- (i) in the event of a fire; and (ii) during a total fire ban day; and (iii) during a fire danger period	Section 5 (l) page/s 15-17
13	6 (m)	The investigations, analysis and methodology to be adopted by the specified operator for the mitigation of the risk of fire ignition from its at-risk electric lines	Section 5 (m) page/s 17-18
14	6 (n)	Details of the processes and procedures by which the specified operator will:- (i) monitor the implementation of the bushfire mitigation plan; and (ii) audit the implementation of the plan; and (iii) identify any deficiencies in the plan or the plan's implementation; and (iv) change the plan and the plan's implementation to rectify any deficiencies identified under subparagraph (iii); and (v) monitor the effectiveness of inspections carried out under the plan; and (vi) audit the effectiveness of inspections carried out under the plan;	Section 5(n) page 18-19
15	6 (o)	The policy of the specified operator in relation to the assistance to be provided to fire control authorities in the investigation of fires near the specified operator's at-risk electric lines.	Section 5 (o) page 19
	Section	Electricity Safety Act 1998	BMP Reference
16	83BA(3)	Section A specified operator must cause a copy of an accepted bushfire mitigation plan to be available for inspection- (a) on the operator's Internet site; and (b) at the operator's principal office in the State during ordinary business hours.	Section 7 Page 20

	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

## Appendix 2 – Training Plans and Competencies

### Rail Lineworker training Competencies (or equivalent)

#### Certificate III in ESI - Rail Traction UET30712 (Supersedes UET30309)

##### Qualification description

This qualification covers the skills and knowledge needed for a career in the tram and train overhead power lines sector of the Rail Industry

- **Training plan**


**JOB DESCRIPTION:** Employees work in the tram and train overhead power lines sector of the rail industry. Work may include the installation, maintenance and inspection of overhead poles/ structure, conductors and cable and rail traction wiring systems. The installation and maintenance of the overhead traction configuration and the installation and maintenance of bonds as well as the operation of the rail traction height access equipment are also included in this job function.

##### CORE UNITS - 17 required

- Apply environment and sustainable energy procedures
- Operate plant and equipment near live electrical conductors/apparatus
- Working safely near live electrical apparatus as non-electrical worker
- Install and maintain poles / structures and associated hardware
- Install and maintain overhead conductors and cables (poles and structures)
- Install overhead traction wiring systems
- Maintain overhead traction wiring systems
- Install overhead traction equipment and components
- Maintain overhead traction equipment and components
- Apply OHS practices in the workplace
- Dismantle, assemble and fabricate electro technology components
- Solve problems in extra-low voltage, single path circuits
- Solve problems in multiple path DC circuits
- Fix and secure equipment
- Use drawings, diagrams, schedules and manuals
- Solve problems in electromagnetic circuits
- Solve problems in single and three phase low voltage circuits

##### Elective Units

- Install traction bonds
- Install overhead traction configurations
- Maintain overhead traction configurations
- Perform rail traction switching operation to a given schedule
- Operate road rail traction height access equipment

	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

## Asset Inspectors

### Certificate II in ESI – Asset Inspection Qualification description

This qualification covers the skills and knowledge needed to complete inspections as outlined in section 5 – Bushfire Mitigation Plan Particulars, section i of this document.

- **Training plan**

**JOB DESCRIPTION:** Employees work in the tram and train overhead power lines sector of the rail industry. Work may include the installation, maintenance and inspection of overhead poles/ structure, conductors and cable and rail traction wiring systems.

#### CORE UNITS - 16 required

- Work safely in the construction industry
- Interpret technical specifications and manuals
- Assist in the provision of on the job training
- Maintain documentation
- Deliver a service to customers
- Use computer applications relevant to a workplace
- Apply Occupational Health and Safety regulations, codes and practices in the workplace
- Comply with sustainability, environmental and incident response policies and procedures
- Working safely near live electrical apparatus as a non-electrical worker
- Operate asset inspection machinery and equipment near live electrical apparatus
- Inspect and treat poles and inspect electrical apparatus
- Identify and interpret characteristics of electrical apparatus associated with power industry needs
- Undertake minor vegetation control and routine minor maintenance of poles and electrical apparatus
- Operate specialised data information and equipment near live electrical apparatus
- Plan the removal of vegetation up to vegetation exclusion zone near live electrical apparatus
- Monitor safety compliance of vegetation control work in an ESI environment


To address the current misalignment of the MTM delivered Asset Inspection training and the Cert II in ESI – Asset Management, effective immediately, MTM inspections are being completed in a 2 person team – with one person holding the qualification in Cert II in ESI – Asset Management and the other being a SME (subject matter expert). This will ensure MTM continue to meet their obligations in the short term. If required, 3<sup>rd</sup> party vendors are used to provide the qualified asset inspection function.

As a result, MTM are looking to source a RTO to conduct a gap analysis on the current competencies of the MTM staff and the requirements of the Cert II in ESI – Asset Management and deliver the required training to gain qualification. RPL may apply in certain circumstances, however the RTO will be engaged to deliver the approved training across the business. This will result in an aligned course in asset inspection being delivered to the MTM staff. The plan for that is as follows:

Action	Status	Expected Completion
Align current Asset Inspection training with the Cert II training that has been endorsed by ESV and roll out to the staff	Looking to engage an RTO that offers the training. Once the new training material is complete, MTM will update ESV with copies to ensure compliance to the requirements before rolling out across the business.	Oct-2020

Approving Manager: General Manager Infrastructure	Approval Date: 31/10/2019	Next Review Date: 22/02/2022
PRINTOUT MAY NOT BE UP-TO-DATE; REFER TO METRO INTRANET FOR THE LATEST VERSION		Page 25 of 27



	<b>BUSHFIRE MITIGATION PLAN 2019-2022</b>	
L2-ELN-PLA-003	Version: 10	Effective from: 30 <sup>th</sup> June 2019

### Appendix 3 - MTM Vegetation and Fire Mitigation Plans

Current status	METRO KEY DELIVERABLES & MILESTONES Bushfire Season Readiness	Division Accountability and Stakeholders
MTM  Next Review Date:  ( Prior to 31 March each year)	<b>ELECTRIC LINE CLEARANCE PLAN</b>  <b>L2-INF-PLA-001</b>	<u>Infrastructure</u>
MTM  Next Review Date:  (before 1 July each year)	<b>BUSHFIRE MITIGATION PLAN</b>  <b>L2-ELN-PLA-003</b>	<u>Infrastructure</u>
Next Review Date:  01/12/2019	<b>FIRE PREVENTION PLAN 2018-19</b>  <b>L2-SQE-PLA-004</b>	<u>Head of Environment - Author</u>
Next Review Date:  22/12/2021	<b>EMERGENCY &amp; CRISIS MANAGEMENT PLAN</b>  <b>L0-SQE-PLA-003</b>	<u>Chief Executive Officer</u>
<b>1 Nov – 31 March.</b>	<b>BUSHFIRE SEASON 2018-2019</b>	
Before 1 July each year	<b>Post Fire Season Review</b>  <b>Incorporated in MTM Fire Prevention Planning Review 2018-19</b>	<u>Safety &amp; Environmental Risk</u>

## Appendix 4 - EN Information Sheet Overhead Wiring TMP Zone Map

