L2-ELN-PLA-003

BUSHFIRE MITIGATION PLAN 2016-2017

Version: 6

Revised: November 2016

Owner: Chief Engineer

Approved By:

Phil Ellingworth

Chief Engineer

Amendment Record

Approval Date	Version	Description
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

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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). An ESV accepted Bushfire Mitigation plan is also a key MTM Electricity Safety Management Scheme (EMSM) commitment.

The MTM Plan for 2016-17 was submitted on the 30 June 2016. ESV conducted a limited audit on the implementation of the BMP on the 02 June 2016 with a report (CM-2097) provided on the 3 Aug 2016. MTM has incorporated the improvement opportunities identified in the audit in this updated MTM Bushfire Mitigation Plan 2016-17 and re-submitted on the 10 October 2016 for ESV for review and acceptance

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, within a 37 month program and up to 61 months in other areas. The HBRA areas are defined annually 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)

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

<u>MTM's Electrical Engineering Division:</u>

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.
- Establish Electric Line clearance vegetation priorities based on asset risk – in summary priority focus on high voltage (22kV) assets and progressive risk based focus for low voltage electrical assets (1.5kV DC).
- 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

<u>MTM's Infrastructure Delivery:</u>

- Ensure electrical workers involved in electrical asset inspections and persons involved in inspection of structures supporting electrical assets in HBRA's are qualified with traction asset competent to assess electrical equipment (refer section 5J).

- Delivery of at-risk asset inspections and corrective actions, prior to commencement of the Victorian Bushfire Season, typically 1 November to the 31 March.

2. Purpose

The purpose of this plan is to define the responsibilities, priorities and controls to be implemented by MTM to minimise the risk of fire ignition in a HBRA due to the at-risk electric assets it manages and its associated operational work practices. It also describes the 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 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 51 km of rail network managed by Metro as illustrated in Appendix 4.

MTM also has a series of complementary Bushfire 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:	Bill Eastoe
Position:	Electrical Design and Review Engineer
Business Address:	Level 16 700 Collins Street, Docklands VIC 3008
Postal Address:	PO Box 1880 Melbourne VIC 3001
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:	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.:	1800 800 007

Name(s):	Jason Arklay
Position(s):	Structures & 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):	1800 800 007

Name(s):	Andrew Russack
Position:	Head of Engineering - Electrical
Business Address:	Level 16, 700 Collins Street, Docklands VIC 3008
Postal Address:	PO Box 1880 Melbourne VIC 3001
Telephone No.:	1800 800 007

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 numbers:

Electrol – Electrical Control Centre	1800 800 007
Metrol – Metropolitan Train Control Centre	9610 7203

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

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

- Appropriately manage 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
- Preserve and enhance the 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 to achieve the mitigation of fire danger arising from the specified operator's at-risk 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 current CFA maps that identify non-low risk Bushfire areas, refer Appendix 4. A review in 2016 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.

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 1500V DC low voltage traction ‘train pantograph contact cables’ and fittings, MTM substation switchyards, associated MTM overhead 22kV supply connections from Distribution companies, the MTM Ferntree Gully to Upwey high voltage 22kV support feeder (nominated as 22/34) and streetlight insulated low voltage 240V service cables within rail car parks.

In January 2015, MTM introduced a strategy to mitigate as far as reasonably practicable the risk of the 22kV 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 22kV FDR 22/34

Bushfire mitigation preventative strategies such as undergrounding or insulating the1500V DC contact cable or Rapid Earth Fault Current Limiters are not applicable in rail. MTM bushfire prevention works focus on at-risk asset inspection associated maintenance works and vegetation clearance.

Note: as stated in MTM Fire Prevention Plan 2015-16, after consulting with the CFA Command for Eastern Region and undertaking a risk assessment and then briefing Emergency Management Victoria, Metro Trains will not staff any station and run train services in the following areas: Belgrave, Upwey, Tecoma and Ferntree Gully.

MTM will 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 immediate overhead de-energisation in addition to stopping all train services and advising emergency services; Police, Fire Services and Ambulance.

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.

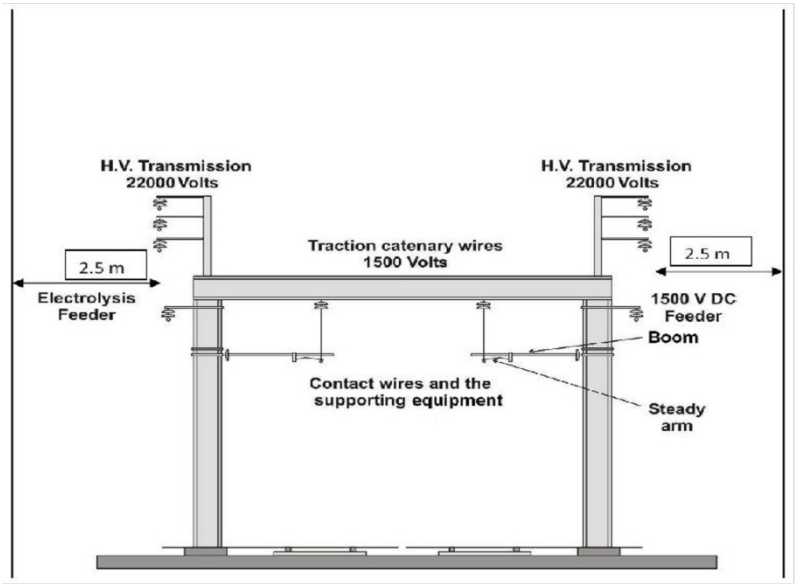

Figure 1: Typical Rail support structure for 1.5 kV DC and 22kV assets

MTM also conducts inspections of vegetation that encroaches on the at-risk electric line and rail signal clearance space as per Metro's L2-INF-PLA-001 Electric Line Clearance Plan 2016-2017. The Electric Line Clearance Plan addresses the vegetation inspection and clearance to electrical overhead assets including sag and sway of electrical lines. The Vegetation Clearance work is undertaken under contract and in emergencies by MTM employees

At Risk Electrical Asset inspections

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

The inspections involve at-risk overhead electrical asset inspection in HBRA's for both LV (1.5kV DC) and HV (22kV assets) MTM's Inspection frequencies and maximum regulatory frequencies are shown in summary in the following tables:-

Table 1: At-risk electric line' 1.5kV DC, 22kV & 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. 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.

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 particular attention 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 scheduled for completion and rectification prior to November 2016 in preparation for the 2016-17 Bushfire Season.

Photo trial is scheduled to continue in 2016 for capture of overhead electrical asset inspections as part of 2016-17 aerial inspections, photos will be taken for both defect and non-defect electrical assets at pole structures. The defect photo capture is to be assessed to support inspection manuals, clarify defect to support restoration work and for inspection performance measurement in the event a specific defect is later identified.

At Risk Electrical Asset Support Structure inspections

MTM inspections also address structure integrity that supports the 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 are shown in table 2.0

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 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.			

An MTM inspection checklist defect criteria for pole inspections (as undertaken by Sterling Group) is defined. MTM has scheduled concrete pole inspections in LBRA scheduled for 2016-17. A trial of photos of poles inspected by Sterling will be reviewed against MTM pole condition guidelines. 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: considered to be pole in As-New condition showing no signs of deterioration or defects and is fit for service until the next programmed inspection.

Serviceable - Condition State 2: Poles that show minor signs of deterioration but not yet considered to be defects warranting treatment. A pole will not require remediation in the foreseeable future.

Serviceable- Condition State 3: These poles are showing signs of deterioration which may require intervention to maintain the life expectancy. Permanent reinforced poles are considered to be in this condition state until there condition changes.

Serviceable: - Condition State 4. The condition of these poles shows advance signs of deterioration where treatment works are required before the next scheduled inspection or a change in the inspection frequency, between 12 months – 24 months is required to monitor the condition.

Condemned: Condition State 5. The pole is in a condition that the pole is no longer serviceable and there is a risk to performance and safety due to its condition. The pole must be marked with an X and a specific management plan implemented.

Table 5: MTM Fault Priority for Structures

Fault Category	Initial Response Time	Categorisation Basis	Example	Typical Course of action
U	Make Safe Immediately <8hrs	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	• Temporary Speed Restriction • Stop Trains • Temporary repair to make the asset safe • Permanent repair, and/or undertake detailed assessment / investigation
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	• Temporary Speed Restriction • Complete remedial works. • Undertake further investigations and/or assessment.
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	• Complete remedial works. • Undertake further investigation and/or assessment.
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.	• Complete remedial works. • Undertake further investigation and/or assessment.
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.	• Specific review of condition at next scheduled inspection.

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;

Electrical asset inspection: At- Risk Lines including associated fittings

MTM Lineworkers:

AC asset (22kV) and traction DC (1.5kV) assets including conductor insulators and associated fittings are inspected by qualified MTM Traction Electrical Lineworkers.

MTM Traction Electrical Lineworkers qualification- UET 30309 - Certificate 3 in ESI - Power Systems or recognized prior learning - refer Appendix 2

MTM inspection form L4-ELN-FOR-032 Walking Examination (Bushfire Areas) has incorporated in the inspection reporting form instructions defining asset inspection defect criteria and priorities (Table 1.1), L2-ELN-MAI-020 to support for MTM Lineworkers involved in at-risk electrical asset inspection in hazardous bushfire risk areas.

Structure Inspection: Structures supporting At- Risk Lines

The reticulation poles and steel traction structures are inspected by contract. The Contractor is required to provide Inspectors competent to the following standard:

Pole inspection

Wood/ concrete/ steel: - supporting At- Risk Lines, Metro required training and competencies:-

- Certificate II ESI Asset Inspection
- - UETTDREL18A Inspect and treat poles and inspection of electrical apparatus

Federation Training (formerly Gippsland TAFE (Chadstone) Certificate II in Asset Inspection UET 20612 and /or recognized prior learning.

Concrete or Steel pole inspection to be undertaken by persons with the following qualifications:-

Certificate III Rail Structures

- TLIB3087A Examine timber structures
- TLIB3088A Examine steel structures
- TLIB3098A Examine concrete/masonry structures

or

- VicRoads Level 1 & 2 Structures Inspection qualified/registered person

or

- A qualified Civil and Structures engineer with experience in the design, inspection or assessment of structures.

Steel Rail Traction Structure supporting At- Risk Lines example (Refer Fig 1)

Engineering Inspections are to be undertaken by a Civil or Structural Engineer holding an Engineering Degree recognized by the Institution of Engineers Australia

New Structures Inspectors/Engineers may work under the supervision of experienced Inspector/Engineer

L2– a level 2 inspections involves the identification of every structure component and the rating of the condition of that component. This can be used to generate an overall score or rating for the asset for the prioritization of repairs, major maintenance, rehabilitation and or replacement.

- Five years relevant experience.
- Minimum two years of experience working within the rail corridor.

- Hold Level 1 Track Protection

L3– a Level 3 structural inspection consists of an extensive inspection undertaken by a Structural Engineer, which may include physical testing and/ or structural analysis to assess generally, but not limited to the following: Current structural condition, structural behavior, capacity, rate of deterioration, residual life expectancy and Assessment management strategies

- A BEng incorporating Structural Engineering
- 5 years of experience working within the rail corridor.
- All hold Level 1 Track Protection Awareness

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 compliance inspections are undertaken by MTM employees supervising or allocating the work. These are undertaken to confirm compliance to MTM asset inspection procedure checklists. Example L4-ELN-FOR-032 Walking Examination (Bushfire Areas). The checklist is also to ensure compliance to the Bushfire Mitigation Plan competencies of the inspector persons referred to in **Section J** and safe track access. Inspection checklist to be available for Bushfire plan audit compliance refer **Section n**

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. Supervisors of personnel involved in Bushfire prevention strategies, procedure audits and inspection activities shall be briefed and /or provided access to this MTM Bushfire Mitigation Plan 2016-17.

For wooden pole Inspections Compliance inspections will be extended to onsite inspections of pole testing work practice against defined inspection criteria including excavation and drilling works.

l. 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)
- 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 PLAN 2015-6-

- 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 Strategies 2014

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;

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.

Metro's Chief Engineer has a key role in the establishment of electrical fire preventative works programs including this Bushfire Mitigation plan

The principle intention is to minimise the risk of ignition and spread of fires caused by Metro's traction electrical assets and associated operations by the following actions:

- Electrical incidents and
- Risk Register – assessment of the risk of fire ignition risk from electrical assets and operations associated with Metro electrical traction assets to be reviewed annually prior to the commencement of the declared fire period.
- Engineering Division (Substations or Overhead Managers) to establish records of on electrical assets failures or contact with electrical assets (non-asset failures) resulting in grass /vegetation fire for the following types of Traction low voltage 1.5 kV DC and high voltage 22kV AC assets:-
  - Protection equipment failure
  - Spark Gap failure
  - Pole and cross-arm failures
  - Insulators failure
  - Pole and cross-arm fire
  - Oil-filled plant failure
  - HV fuse failure
- Analysis of the electrical network performance, statistical information and audit results to identify high risk areas. Use this information to set priorities for preventative and reactive works.
- Analysis of information compiled during the MTM's Electric Networks Service Schedule Walking Examinations for Hazardous Bushfire Areas prior to the commencement of the declared fire period.

n. Details of the processes and procedures by which the specified operator will monitor the implementation of the bushfire mitigation plan

System audits shall be conducted in accordance with MTM internal procedures and the ISO 9001:2008 standard. The Metro nominated Auditor/s shall have a minimum 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 in 2016-17 shall include:-

- MTM Bushfire Mitigation Plan 2016-17 for regulatory compliance.
- Deficiencies identified in the plan to be addressed through corrective actions in INX Bushfire Mitigation Actions 2016-17.
- the effectiveness of compliance inspections carried out under the plan;

MTM monitors Bushfire mitigation works through the following:-

- Daily situation reports
- Tree clearance programs to regulatory compliance requirements for HBRA and LBRA.
- Asset inspection and maintenance plans for both at-risk lines in HBRA's
- Compliance audits of the 2016/17 BMP Implementation.
- Audit actions identified in the June 2016 ESV MTM Audit are captured in INX with defined close-out dates prior to 1 November2016 in preparation for the 2016-17 Bushfire Season actions close-outs.

<u>Bushfire Mitigation plan – Monitoring</u>

Senior Management will monitor the Bushfire Mitigation works through periodic internal and external audits and through MTM Visualisation internal communication process and participation in Industry audits with Energy Safe Victoria (ESV).

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. Attendees include senior managers, corporate risk, internal auditors, and key personnel involved in the BFM program. CFA representatives may also be invited to attend in future.

  Improvement opportunities are discussed and included in next years BFM Plan as required.
- The Summer Pre-Season Briefing, held before the start of the 2014/15 fire declaration period. With the aim to progress of BFM plan activities and to plan contingencies, if the need arises, to meet the requirements of the plan.
- 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. Assets currently photographed are HBRA overhead electrical asset connections to structures and in 2016-17 LBRA concrete pole inspection photos to be trialled.

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 the agencies such as SES, CFA, MFB and Victorian Police including matters relating to traction electricity supply and security.

MTM's policy is to provide 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

6. Exemption

MTM will not seek exemption under the Bushfire Mitigation Regulations for the 2016-17 Plan.

7. Availability of 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 www.METROtrains.com.au: (Refer: Contact US section)

Sample Internet advice: - Availability of Bushfire Mitigation Plan**:**

Metro Electric Line Clearance Plan and Bushfire Mitigation Plan

In compliance to the Electricity Safety Act, Metro's Bushfire Mitigation Plan and Electrical Line Clearance Plans are available on request.

Click here to download the Metro Bushfire Mitigation Plan 2016-17.

Click here to download the Metro Electric Line Clearance Plan 2016-17.

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:

L0-SQE-PLA-005 Environmental Management Plan 2016-2017
L2-INF-PLA-004 Vegetation Management Plan 2016-17
L2-INF-PLA-001 Electric Line Clearance Plan 2016-17
L2-SQE-PLA-004 Fire Prevention Plan 2015-16
L0-SQE-PLA-003 Emergency & Crisis Management Plan 2016
L4-ELN-FOR-032 EN Form Walking Examination (Bushfire Areas)
L2-ELN-MAI-020 Maintenance Instruction Walking Exam. (Bushfire Areas)

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

Appendix 1 - Prescribed Particulars of Bushfire Mitigation Plan

No	Regulation	Electrical Safety (Bushfire Mitigation) Regulations 2013 Prescribed particulars for bushfire mitigation plans—specified operators	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 4
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 5
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/s 6/7
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 7-11
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 12-13
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 13

	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 13-15
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) pages 15-16
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/s 16-17
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 17
	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 17

Appendix 2 - Rail Lineworker training Competencies (or equivalent)

Certificate III in ESI - Rail Traction 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

Appendix 3 - MTM Vegetation and Fire Mitigation Plans

Timeframe	METRO KEY DELIVERABELS & MILESTONES Bushfire Season 2016-17	Division Accountability and Stakeholders
31 March 2016 (before)	**ELECTRIC LINE CLEARANCE PLAN** 2016-17 L2-INF-PLA-001 (Faults 22kV HBRA and LBRA Priority HBRA 1.5kV DC risk mitigation)	**Infrastructure**
June 2016	**ESV Bushfire Mitigation Audit 2015 -16** Bushfire Mitigation, Electric Line Clearance HBRA Bushfire Walking Inspection	**Infrastructure**
1 July 2016 (before)	**BUSHFIRE MITIGATION PLAN** 2015-16 L2-ELN-PLA-003	**Chief Engineer**
July 2016	**VEGETATION MANAGEMENT PLAN** 2016-17 L2-INF-PLA-004	**Safety & Environmental Risk**
1 June 2016	**ENVIRONMENTAL MANAGEMENT PLAN** 2016-17 L0-SQE-PLA-005	**Safety & Environmental Risk**
Aug - Sept 2016	**HBRA 22kV & 1.5kV DC Walking Exam** L2-ELN-SCH-216 / L4-ELN-FOR-032 Pole & Structure Inspections Pole Trial Digital Photo	**Infrastructure**
Aug-Oct 2015	**Summer Readiness and Audit Compliance** **Remedial Actions**	
Oct 2016	**EMERGENCY & CRISIS MANAGEMENT PLAN** 2016 L0-SQE-PLA-003	**Business Resilience**
Nov 2016	**FIRE PREVENTION PLAN** 2016-17 L2-SQE-PLA-004	**Infrastructure**
1 Nov 2016 – **31 March 2017.**	**BUSHFIRE SEASON 2016-2017**	
April 2017	**Post Fire Season Review 2016-176** **ESV and MTM Technical Assurance Audit Close-out**	Safety & Environmental Risk

Appendix 4 - EN Information Sheet Overhead Wiring TMP Zone Map