L2-ELN-PLA-003

BUSHFIRE MITIGATION PLAN 2015-2016

Version: 5

Revised: 30 June 2015

Owner: Chief Engineer

Approved By:

Norm Grady

Acting Chief Engineer

Approval

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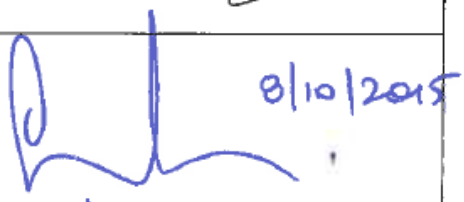
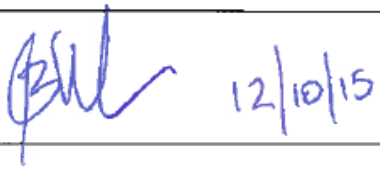
Document Endorsers	Andrew Russack	Head of Engineering - Electrical	
	Brad Wilson	Manager Electrical Networks Delivery	
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Amendment Record

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

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

MTM's Bushfire Mitigation Plan addresses the identification of at-risk electrical traction assets in hazardous bushfire areas (HBRA) and the inspection and maintenance of those assets, within a 3 year program. The HBRA areas are defined annually by the Country Fire Authority (CFA). The BMP also outlines strategies and improvement actions and associated monitoring and auditing activities to minimise the risk of fire ignition from at-risk assets.

The BMP 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:-

MTM's Electrical Engineering Division:

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

- Annual identification 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 and Plans to continuously reduce the risk of fire ignition from electrical traction assets.
- Establish Electric Line clearance vegetation priorities based on asset risk – 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 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 asset inspection (excluding pole inspection) in HBRA's are qualified with traction asset experience to assess defective electrical equipment as defined in Metro's overhead asset Inspection Guidelines. The Inspection Guidelines and qualification records management system for Electrical Workers, including contract pole inspectors, to be provided to ESV for approval (refer section 5J).
- Delivery of at-risk asset inspections plans, prior to commencement of the Bushfire Season.

2. Purpose

The purpose of this plan is to define the responsibilities, priorities and controls required to be implemented by MTM to minimise the risk of fire ignition eventuating in a bushfire 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 electric lines under MTM control that are within hazardous bushfire risk areas. The defined Hazardous Bushfire Risk Area covers approximately 51 km of rail network managed by Metro

4. Abbreviations and Acronyms

HBRA – Hazardous Bushfire Risk Area

LBRA – Low Bushfire Risk Area

MTM – METRO Trains Melbourne

MURL – Melbourne Underground Rail Loop

SIMS – MTM's Safety Information Management System.

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.:	03 9619 5660

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):	0404 048 609

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	9610 5999
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 and responsibly care for the environment.

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.
- Minimization of ignition and spread 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 Hazardous Bushfire Risk Areas containing MTM Overhead Electrical assets were determined based on the latest CFA maps that identify non-low risk Bushfire areas, refer 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;

MTM has developed a set of maintenance strategies that incorporates inspections, programmed preventative works and corrective maintenance regimes.

MTM manages approximately:-

- 830km of track (and approximately the same length of 1.5 kV DC overhead wiring);
- 273 electrical reticulation poles excl. streetlighting (currently 59 concrete & 214 timber poles)

The majority of electrical assets are supported by steel traction infrastructure (example Fig 1). The integrity of both poles and steel traction assets are inspected under contract.

Maintenance and repair of overhead line assets are scheduled as part of MTM's maintenance program. This involves walking inspections of MTM overhead lines which are carried out by MTM Infrastructure maintenance staff who inspect cross-arms, insulators, conductor, and switches and associated line hardware. Defects identified are then captured and prioritised in MTM's corrective work order data base.

MTM also conducts inspections of vegetation that encroaches on the at risk electric line clearance space as per Metro's L2-INF-PLA-001 Electric Line Clearance Plan 2015 -2016. Tree clearance in Figure 1 is shown as 2.5 m based on Electric Line Clearance Regulations (1.5 m) plus an additional metre for regrowth. Note the Electric Line Clearance Plan addresses the vegetation inspection and clearance to electrical overhead assets.

MTM's high voltage overhead conductors in declared HBRA's are limited to substation supplies from Distribution Supply companies and one MTM backup 22kV feeder nominated as 22/34. The L2-ELN-WOI-002 MTM Bushfire Risk Mitigation Electrical Procedure – Disconnection and Reconnection of 22kV Feeder 22/34 -2015 has been developed to mitigate as far as reasonably practicable the risk of the Metro 22/34 Ferntree Gully to Upwey 22kV back-up supply line assets and the operation of these assets initiating or contributing to a Bushfire event. – refer section l page 9/10.

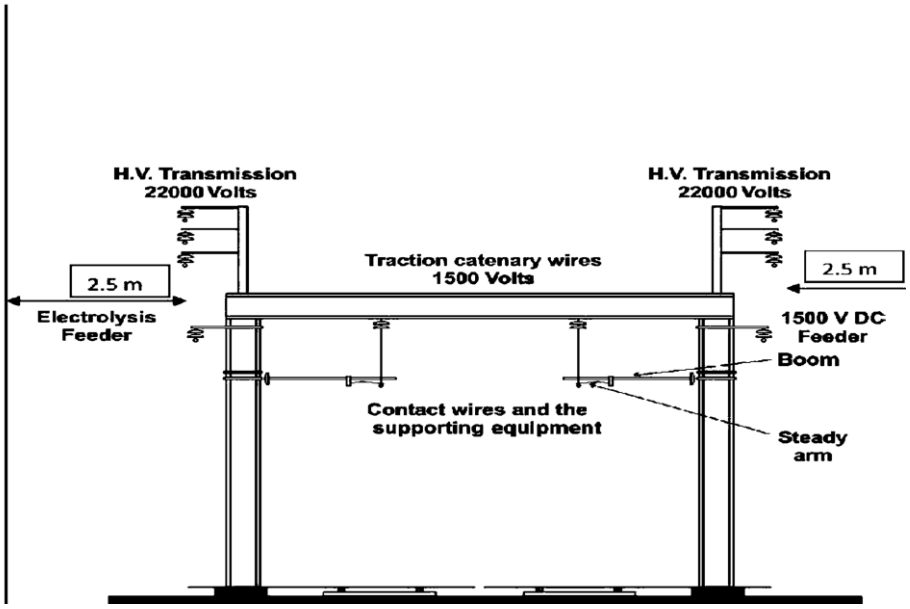


Figure 1: Typical Rail support structure for 1.5 kV DC and 22kV assets

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;

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 (1500V DC) and HV (22kV assets) and maximum regulatory frequencies are shown in the following table:-

Description	Frequency
22kV Aerial (Overhead) Feeder Exam	36 month (+/- 1 month)
Walking Exam (Hazardous Bushfire Areas)	36 month (+/- 1 month)

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

- In-span Wiring: - examine Contact, Catenaries and aerial feeder wires, paying particular attention to: Sagging or low wire, broken insulators missing/damaged droppers. Compliance requirements Refer L2-ELN-MAI-020 Electrical Networks Maintenance Instruction Walking Examinations (Bushfire Areas) and L4-ELN-FOR-032 Inspection Form.

- Pre-summer vegetation audits to identify branches closer than 2.5 metres to structures, aerial feeder cables and other conductors in declared HBRA.

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;

The reticulation poles and steel traction structures are inspected under contract. The Contractor shall require Inspector competency to the following standard:-

Pole inspection- wood/ concrete: - supporting Low Voltage, public lighting, 1.5kV DC and 22kV asset, Metro required training and competencies:-

- Federation Training (formerly Gippsland TAFE (Chadstone) Certificate II in Asset Inspection UET 20612 and /or recognised prior learning.
- 5 years of experience working within the rail corridor.
- Level 1 Track Protection.

Steel Traction Structure Inspections: - Structures supporting 1500VDC and 22kV Asset assets

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 Card / Pegasus.

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:- UET 30309 - Certificate 3 in ESI - Power Systems - . Refer Appendix 2.

MTM has also developed an inspection checklist L4-ELN-FOR-032 incorporated in the inspection form together with a support instruction defining asset inspection defect criteria and priorities, L2-ELN-MAI-020 for MTM electrical qualified Lineworkers involved in at risk electrical asset inspection in hazardous bushfire risk areas.

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;

Independent process and system audits shall be conducted in accordance with MTM internal procedures and the ISO 9001:2008 standard. The Metro nominated Auditors shall have a minimum competency level of 2 years experience in auditing and possess a recognised Internal or Lead Auditor SAI Global qualification or equivalent and have electrical reticulation experience or support from an electrical subject Matter Expert/s (SME).

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 the auditing process. All personnel involved in Bushfire prevention strategies, procedure audits and inspection activities shall be provided access to the current MTM Bushfire Mitigation Plan.

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 would 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 2014-15:-

- 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 will assess the associated impact and develop contingencies to avoid the potential of stranded trains as a key priority.

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 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.

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,
- 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 will introduce bus services alternatives to address long lead time 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 an oversight of 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 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.
- Fires occurring, either on railway land or on adjacent land, having originated within the reserve are logged in MTM's Safety Information Management System (SIMS) Commencing October 2014 Metro's SIMS incident involving electrical network fire ignition investigations and close-out to be undertaken by Metro's Engineering Managers for Substations or Overhead .
- Engineering Division (Substations or Overhead Managers) to establish records of statistics based 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

- audit the implementation of the plan;
- identify any deficiencies in the plan or the plan's implementation
- change the plan and the plan's implementation to rectify any deficiencies
- monitor the effectiveness of inspections carried out under the plan;
- audit the effectiveness of 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 and assets in LBRA's

- Detailed inspection management
- Compliance audits of the 2015/16 BMP Implementation.

Bushfire Mitigation plan – Monitoring

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

- Deficiencies identified in the plan to be addressed through Audit corrective actions Refer Bushfire Mitigation Improvement Actions & Responsibilities Plan Development 2015-16 - Appendix 5.

Review

The MTM Bushfire Mitigation Plan is reviewed each year and adjustments/improvements are made to better meet the objectives of the plan. There are various means by which feedback is obtained and improvements are identified including:

- The Post Fire Season Review, this is a new process introduced for the 2014/15 plan held at the end of the fire danger period to review our performance under the plan. Attendees to 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, this is a process introduced for the 2014/15 plan held before the start of the 2014/15 fire declaration period. With the aim to provide an opportunity to report on the progress of BFM plan activities and to plan contingencies, if the need arises, to meet the requirements of the plan.

- MTM Engineering are currently trialling high resolution binoculars and cameras as support tools to provide a more detailed evaluation of overhead HV line asset condition.

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 to fire control authorities in the investigation of fires near MTM's at-risk electric lines and electrical lines in HBRA's. Assistance and information sharing will be incorporated in the Fire Prevention Plan by 30 June 2015.

6. Exemption

MTM will not seek exemption under the Bushfire Mitigation Regulations.

MTM will seek an exemption for tree clearance under the Electric Line Clearance Regulations 2015.

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**

Sample Internet advice: - Availability of Bushfire Mitigation Plan

For the purposes of compliance to the Electricity Safety Act, MTM's Bushfire Mitigation Plan and Electrical Line Clearance Plan are to be made publically available upon request. To request a copy of the MTM Bushfire Mitigation Plan, call +61 3 9610 2400*.*

8. Reference Acts Regulations and Code of Practice:

Electricity Safety Act 1998

Electricity Safety (Bushfire Mitigation) Regulations 2013

Electricity Safety (Electric Line Clearance) Regulations 2010

Electric Line Clearance Code of Practice 2010

9. MTM Related Plans and Reference Documents:

L0-SQE-PLA-005	Environmental Management Plan 2014-2015
L2-INF-PLA-004	Vegetation Management Plan 2014-15
L2-INF-PLA-001	Electric Line Clearance Plan 2015-16
L2-SQE-PLA-004	Fire Prevention Plan 2014-15
L0-SQE-PLA-003	Emergency & Crisis Management Plan 2015
L4-ELN-FOR-032	EN Form Walking Examination (Bushfire Areas)
L2-ELN-MAI-020	EN Maintenance Instruction Walking Examination (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 5 - Bushfire Mitigation Improvement Actions & Responsibilities 2015-16

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 7/8
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 8
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 9

	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 9/10
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 10/11
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 11/12
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 12
	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 13

Appendix 2 - Rail Lineworker training Competencies (or equivalent).

Core Units of Competency – Complete All (Note: Occupational Health and Safety, and Sustainability skills and knowledge are integrated into units of competency)						
Unit code	Field of Education Code	Unit title	Prerequisite	Credit Matrix Level	Credit Matrix Points	Nominal duration
UEENEEE001B		Apply OHS practices in the workplace	Nil	1	4	40
UETTDREL03B	031311	Comply with environmental and incident response procedures	Nil	2	4	40
UETTDREL04B	031311	Working safely near live electrical apparatus as non electrical worker	Nil	2	4	40
AI001A	031311	Operate asset inspection plant, machinery and equipment near live electrical apparatus	UEENEEE001B UETTDREL03B UETTDREL04B	2	4	40
AI002A	031311	Inspect and treat poles and inspection of electrical apparatus	UEENEEE001B UETTDREL03B UETTDREL04B	2	4	40
AI003A	031311	Identify and interpret characteristics of electrical apparatus associated with power industry assets	UEENEEE001B UETTDREL03B UETTDREL04B	2	4	40
Elective Units of Competency – at least 3 to be completed						
AI004A	031311	Undertake minor vegetation control and routine minor maintenance of poles and electrical apparatus	UEENEEE001B UETTDREL03B UETTDREL04B AI001A	2	4	40
AI005A	031311	Operate specialised data information equipment near live electrical apparatus	UEENEEE001B UETTDREL03B UETTDREL04B	2	4	40
MEM16008A		Interact with computing technology	Nil	2	2	20
MEM16012A		Interpret technical specification and manuals	Nil	3	4	40
MEM17003A		Assist in the provision of on the job training	Nil	2	2	20
BSBCUS201A		Deliver a service to customers	Nil	2	4	40
Total nominal hours						320 - 360

Appendix 2 (Continued) – Rail Inspection 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

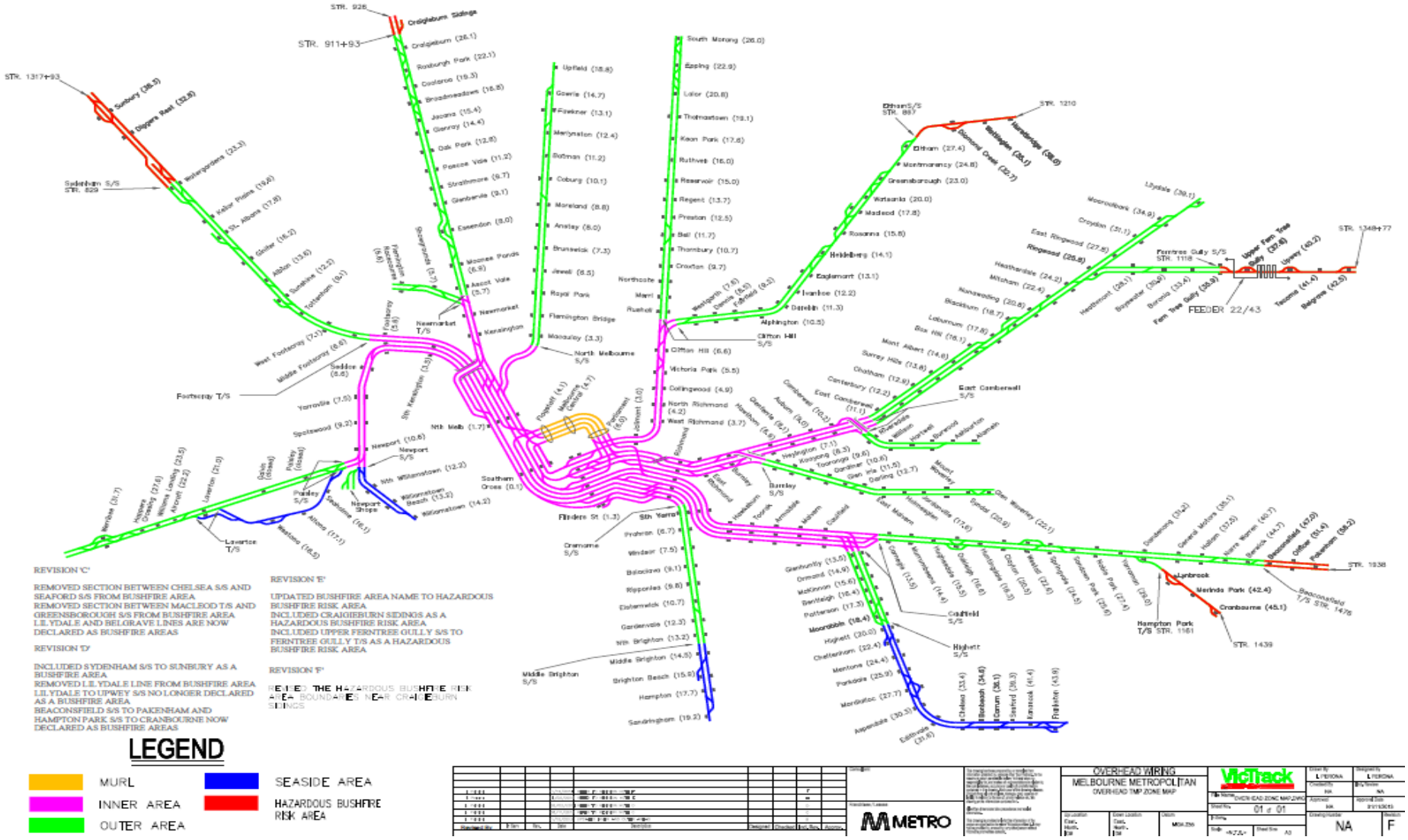
Elective Units

- 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 Prevention Plans

Timeframe	METRO KEY DELIVERABELS & MILESTONES 2015-16	Division Accountability and Stakeholders
1 Nov 2014 – 31 March 2015.	**BUSHFIRE SEASON 2014-15**	
31 March 2015 (before)	**ELECTRIC LINE CLEARANCE PLAN** 2015-16 L2-INF-PLA-001 (Faults 22kV HBRA and LBRA Priority HBRA 1500 V DC risk mitigation) Note: Proposed New Regulation - June 2015	**Infrastructure** Frank Fullick, Pat Kelly Mat Waterhouse Katrina Lewis, Bill Eastoe
15 April 2015	**Post Fire Season Review 2014-15** ESV and MTM Technical Assurance Audit Close-out	**Safety & Environmental Risk**
1 July 2015 (before)	**BUSHFIRE MITIGATION PLAN** 2015-16 L2-ELN-PLA-003	**Chief Engineer** Frank Fullick Andrew Russack
July 2015 (Last Update)	**VEGETATION MANAGEMENT PLAN** 2015-16 L2-INF-PLA-004	**Safety & Environmental Risk** Elizabeth Hennessy Robin Weston
1 July 2015 (Last Updated)	**ENVIRONMENTAL MANAGEMENT PLAN** 2015-16 L0-SQE-PLA-005	**Safety & Environmental Risk** Elizabeth Hennessy Robin Weston
June -July 2015	**HBRA 22kV & 1500V DC Walking Exam** L2-ELN-SCH-216 / L4-ELN-FOR-032 Pole & Structure Inspections HBRA Trial Digital Photo &GPS Data capture in Ellipse	**Infrastructure** Brad Wilson Brett Watson Linton Gloster
Aug 2015	**INFRASTRUCTURE SUMMER READINESS PLAN** 2015-16 L4-ELN-FOR-032	**Infrastructure** Brad Wilson Brad Watson
Aug 2015	**MTM Bushfire Mitigation & Risk Register Audit** 2015 -16	**Chief Engineer/Technical Assurance** Quinton Smit Phil Sutcliffe
Aug-Oct 2015	**Summer Readiness and Audit Compliance Remedial Actions**	
6 Oct 2015 (Last Updated)	**EMERGENCY & CRISIS MANAGEMENT PLAN** 2015 L0-SQE-PLA-003	**Business Resilience** Andrew Fuller
1 Nov 2014 (last updated)	**FIRE PREVENTION PLAN** 2015-16 L2-SQE-PLA-004	**Infrastructure** Robin Weston Andrew Fuller
Dec 2015	**ESV Bushfire Mitigation Audit 2015 -16** Bushfire Mitigation, Electric Line Clearance HBRA Bushfire Walking Inspection	Philip Sutcliffe Linton Gloster
1 Nov 2015 – 31 March 2016.	**BUSHFIRE SEASON 2015-2016**	

Appendix 4 - EN information Sheet Overhead Wiring TMP Zone Map



Appendix 5 - Bushfire Mitigation Improvement Actions & Responsibilities 2015-16

BFM Regulations: - **Section 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;	Training for employees and Contractors involved in HBRA Walking Inspections and Asset poles and Structures Inspections to be submitted for ESV approval		
Reference	**ESV Compliance Issues**	**Actions Proposed**	**MTM Accountability**	**Due Date**
BMP 2015-16	Linton (Structures and Facilities) indicated Training requirements identified in the BMP 2014-15 for Poles and Steel Structures need to be reviewed and re-submitted for ESV approval	Training requirements Pole and Steel Structure Inspections as identified in BMF plan Section J page 8 to be reviewed and resubmitted for ESV approval	Linton Gloster	30 Oct 2015
Desktop Audit	1.2.2 MTM utilise an external contactor to inspect poles and electrical structures. It was stated that the results of these inspections can take 2 to 3 months to be passed to MTM. It was also stated that there is no contractual performance measures with the contractor as there is no contract. MTM need to ensure the contractor provides information to MTM in a timely manner so that MTM can make timely decisions that affect their assets and have the latest information on their assets. (ARA)	2015/16 Structures and Facilities Action Plan / Procedure to address:- • 2-3 month information delay • Sterling Contract review including 2015/16 performance measures • Interim inspection contract requirements:- ○ timeframes (less than 36 months) ○ Defective limits ○ Risk ratings ○ Defect codes photo or detailed description of what constitutes defect.	Linton Gloster	30 Oct 2015
Desktop Audit	1.2.3 MTM's external inspection contractor inspects assets based on their internal inspection standards & processes. MTM do not have an inspection manual that includes the standard of inspection required or procedures to be used to inspect. If the current contractor changes then MTM will need to ascertain the credentials of any new contractor which would require time and effort and may delay inspection timeframes. MTM need to consider having their own manual and procedures and control the inspection standards used on their network. This manual needs to have agreed inspection timeframes, defect limits, risk ratings, defect codes, photos or detailed description of what constitutes a defect, etc. (ARA)	2015/16 Structures and Facilities Action plan to address:- Structures Inspection & Maintenance Manual and/or specific procedures to be developed to define MTM Pole and Structures Inspection standards :- • MTM inspection timeframes (less than 36 month) • Defective limits • Risk ratings • Defect codes photo or detailed description of what constitutes defect etc. Reference: Draft MTM –Sterling 20120501Structures Inspection & Maintenance Manual May 2012 (previously supplied to ESV).	Linton Gloster	30 June 2016

Reference	ESV Compliance Issues	Actions Proposed	MTM Accountability	
BMP 2015-16	Training requirements identified in the BMP 2014-15 for Aerial Asset inspections in HBRA need to be reviewed and re-submitted for ESV approval	MTM Aerial Asset inspectors involved in defect identification in 2015 to be competent to:- • Rail Line worker training records competencies (or equivalent) refer Appendix 2 BMP 2015-16 Inducted in:- • L4-ELN-FOR-032 ELECTRICAL NETWORKS FORM WALKING EXAMINATION (BUSHFIRE AREAS) MTM Aerial Asset Inspection Supervisor/s responsible for Aerial Asset inspectors compliance to be Inducted in :- • L2-ELN-MAI-020 ELECTRICAL NETWORKS MAINTENANCE INSTRUCTION WALKING EXAMINATION (BUSHFIRE AREAS). • MTM Bushfire Mitigation Plan 2015-16 2015/16 Induction and Trade qualification records of level 1 available on request.	Brad Wilson / Brett Watson	Close out date Records available - commencement of 22kV walking inspection audit September 2015
- Desktop Audit	**1.2.4** MTM's line inspection utilises the MTM linesmen to check the condition of the electrical assets. It was stated that the lineworker or his supervisor signs off as work being completed satisfactorily. Audits of this work was stated as being ad-hoc and unplanned with no documented procedure in place to guide the audit process. It was also stated that no written records were produced of audits undertaken. MTM need to review the audit process undertaken and produce proper guidance and support for auditing on completed inspections (ARA).	2015/16 Action plan MTM Lineworkers undertaking HBRA 22kV Aerial Asset inspection to be compliance assessed to L4-ELN-FOR-032 and on-site defect capture. • Performance assessment and records undertaken by Aerial Asset Inspection Supervisor for all Llineworkers responsible for 2015/16 22kV HBRA defect data capture Desk top Audit of HBRA 22 kV inspection Scope of Works Aerial asset inspections, performance records and defect resolution: • Audit undertaken by MTM Qualified Auditor	Philip Sutcliffe Brad Wilson / Brett Watson	September 2015

Reference	ESV Compliance Issues	Actions Proposed	MTM Accountability	
BFM Regulations: - **Section 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;			
Audit Recommendations:	MTM should review the reasons why the auditor found assets that needed action but the MTM inspector did not find these. MTM may need better inspection equipment or technique to assist their inspectors to see close details	Special Tools & Equipment Binoculars and high resolution camera with in-built GPS to be introduced in HBRA aerial 22kV asset inspections 2015/16 Photo trial of 22kV Overhead assets 2015-16 Photo capture of all 22kV HBRA pole tops subject to additional Desk Top photo defect inspection.	Brad Wilson/ Brett Watson	Close out date required prior to 1 Nov 15
BFM Regulations: - **Section 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;			
BMP 2015-16	Records of Pole and Structures asset inspections and condemned assets in HBRA and LBRA Actions to address condemned assets prior to Bushfire Seasons (1 Nov 2015 - 31 March 2016)	Prior to 1 Nov 2015. - Defect list to be available on request - Priority condemned assets to be rectified	Linton Gloster	30 Oct 2015
BMP 2015-16	Records of Aerial Asset Walking inspections and condemned assets in HBRA and LBRA Actions to address condemned assets prior to Bushfire Seasons (1 Nov 2015 - 31 March 2016)	Prior to 1 Nov 2015. - Defect list to be available on request - Priority condemned assets to be rectified	Brad Wilson/ Brett Watson	Close out date required Prior to 1 Nov 15
Major issues identified.	**1.1.3.2** At the Upwey Substation, the bushings of the circuit breaker and the R1 transformer were severely damaged.	Remedial works for broken insulators confirmed. Works to be addressed within maintenance program	Alan Conrau	Close out date required prior to 1 Nov 15

Reference	ESV Compliance Issues	Actions Proposed	MTM Accountability	
General Observations	**1.1.4.2** Along the Hurstbridge line there were many boom insulators with evidence of birds chewing the edges of the polymeric insulator sheds. Whilst the amount of damage is not yet significant,	Remedial works for damaged insulators confirmed Works to be addressed within maintenance program	Brad Wilson/ Chris Hudson	Close out date required prior to 1 Nov 15
BFM Regulations: Section N	Details of the processes and procedures by which the specified operator will monitor the implementation of the bushfire mitigation plan			
	- monitor the effectiveness of inspections carried out under the plan; - audit the effectiveness of inspections carried out under the plan;	Aerial Asset Walking Inspections - Internal Audits of Bushfire Mitigation Plan programs and processes to be carried out by MTM Auditor - Annual ESV-MTM Audit on adherence to Bushfire Mitigation Plan.	Brad Wilson/ Philip Sutcliffe	Close out date required by 12 August
	- monitor the effectiveness of inspections carried out under the plan; - audit the effectiveness of inspections carried out under the plan;	Poles and Structures - Internal Audits of Bushfire Mitigation Plan programs and processes to be carried out by MTM Auditor - Annual ESV-MTM Audit on adherence to Bushfire Mitigation Plan	Linton Gloster/ Philip Sutcliffe	30 Oct 2015
	- identify any deficiencies in the plan or the plan's implementation - change the plan and the plan's implementation to rectify any deficiencies	Action and responsibilities established to resolve 2014/15 Audit issues and incorporate in MTM BMP 2015/16 – 16 August Actions confirmed at MTM Bushfire Coordination meeting 26 August 2015	Bill Eastoe/ Philip Sutcliffe/ Brad Wilson/ Linton Gloster	16 August 2015
	- Audit the implementation of the plan;	Pre-Summer Management Plan Audit – Oct 15	Philip Sutcliffe/ MTM SE&R Auditors	Aug-Oct 2015