



AUSTRALIAN RAIL TRACK CORPORATION LTD

Discipline: Engineering

Category: Procedure

Fire Prevention Management

PP-167

Applicability

ARTC Network Wide		Western Jurisdiction	
New South Wales		Victoria	✓

Document Status

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1 Purpose

The Fire Prevention Management Procedure enables ARTC to satisfy current legislative and lease requirements and also serves to offer guidelines to establish and implement annual fire prevention plans.

2 Scope

This Procedure covers fire prevention management of ARTC's Victorian Network.

3 Legislative Requirements

3.1 Federal Legislation

The most relevant federal legislation that impacts on Fire Prevention in railway corridors is the Environment Protection and Biodiversity Conservation (EPBC) Act, 1999. This Act identifies activities that are likely to have environmental impacts and how these impacts are properly assessed and managed. The act is particularly relevant when work is carried out on protected "biosites" containing endangered native vegetation that exist on the right of way.

3.2 Victorian Legislation

In Victoria, the principal fire prevention legislation applying to non urban areas of rail reserve, for which ARTC is responsible is the Country Fire Authority Act (1958), in particular sections 41 and 43.

Briefly, Section 41 states:

"In the area of country Victoria, the fire prevention officer of a municipal council (MFPO) may serve a fire prevention notice on the owner or occupier of land in the municipal district of that council (other than a public authority)."

The MFPO will serve a fire prevention notice if they are under the opinion that there is anything that may constitute danger to life or property from the threat of fire.

Section 43 requires Public Authorities to:

"take all practicable steps to prevent the occurrence of fires on, and minimise the danger of the spread of fires on or from any land vested in it or under its control or management".

Although ARTC is not a public authority, by virtue of the Rail Corporations Act (1996) and through the Infrastructure Lease Agreement, the responsibilities outlined in s.43 are transferred to the lessee.

In addition to the above, the Deeds of Amendment to the Infrastructure Lease Agreement also require ARTC to:

- undertake all fire prevention measures required by the Country Fire Authority Act 1958 (Vic) and The Metropolitan Fire Brigade Act 1958 (Vic). This includes issuing annual fire precaution instructions to maintenance and operating staff prior to each fire season, and updating lists of emergency contact details for staff and contractors.
- formally document clear wildfire management policies, procedures, plans and operational policies, setting out the organisation's objectives, responsibilities and standards for fire mitigation, specifying management and control systems and identifying roles and responsibilities in relation to wildfire mitigation, which ensures outcomes are reported and reviewed
- Prepare an annual fire management plan to the Office of the Director of Public Transport (ODPT). The plan should provide details of the work to be carried out to minimise the risk of fires starting from rail operations, and to maximise community liaison. The plans should be taken to the Municipal Fire Prevention Committees (MFPC)

- include a program of auditing fire prevention works carried out on its behalf and must be linked with the municipal fire prevention planning process, through attendance at key municipal fire prevention committee meetings and/or liaison with municipal fire prevention officers, the Melbourne Fire Brigade and/or the Country Fire Authority, as the case may be

Where applicable, ARTC and its Contractors will also comply with the requirements of other relevant Victorian State and Regional legislation and regulations including but not limited to:

- Metropolitan Fire Brigades Act 1958
- National Parks Act 1975
- Conservation, Forest and Lands Act 1987
- Planning and Environmental Act 1987
- Transport Act 1987
- Flora and Fauna Guarantee Act 1988
- Catchment and Land Protection Act 1994
- Rail Corporations Act (1996)

4 Responsibility

The ARTC Corridor Manager Victoria is responsible for Fire Prevention Management on ARTC's Right of Way in the State of Victoria.

5 Fire Prevention Procedure

5.1 Identifying and Reporting Fire Risks

5.1.1 Introduction

The following procedure outlines the requirements for the development of the annual Fire Prevention Plan. This Plan is to be developed by the ARTC Corridor Manager Victoria in consultation with the relevant fire prevention officers from municipal councils and the DOI Public Transport Emergency Management Planning Coordinator's Committee (EMPC).

5.1.2 Understanding the sources and impacts of fire on a rail corridor

Fires that impact on rail operations can either be started on the rail corridor itself or from other sources outside the corridor. Causes of fires that start on the rail corridor may include movement of trains, track maintenance activities, arson, accidental incidences and lightning strikes. The chance of a fire spreading throughout the corridor and potentially to neighbouring properties is influenced by the type, amount and arrangement of vegetative fuel and also the prevailing weather conditions. The impact on infrastructure from bushfires that start from outside the corridor may also be dependent upon the vegetative fuel present.

5.1.3 Identification and prioritisation of fire hazards

It would be ideal to control unwanted growth along the entire rail corridor; however it is not economically feasible to do this. Therefore, fire hazards have been identified and categorised in order to address high risks first. Appendix A provides a detailed risk assessment carried out in accordance with AS/NZ 4360: *Risk Management*.

Risks and consequences have been measured against three categories, namely:

- people - consequences range from incident report to fatality
- economic - consequences range from < \$10,000 to > \$10m and
- network - consequences range from incident report to loss of accreditation

The following risks were identified as either extreme or high:

- 1) fires started on rail corridors caused by rolling stock, track maintenance, arson or lightning and spreading to adjacent properties that were inhabited.
- 2) fires started on rail corridors or bushfire causing damage to heat sensitive rail infrastructure such as bridges and signalling equipment.
- 3) fires started on rail corridors or bushfire causing damage to the track formation

To address the above risks, it is necessary to identify the each of the components that make up the total fuel hazard. These are explained in the following sections.

5.1.4 Level of fuel

Physical attributes such as the height, volume and type of fuel determine the level of risk. Although all trees and shrubs are combustible under certain circumstances, very rarely are they the point ignition. Train control records and CFA data show that in the majority of cases it is the level of flammable undergrowth that acts as the "wick" to a fire and hence represents the majority of the risk. The following ratings are given as a general guide applicable to the level of undergrowth:

Low - evergreen plant species (not containing volatile oils)- some native grasses (surveyor may need further training to identify these)
- sparse in density, < 300mm in height

Medium - dense growth < 300mm in height

High - growth >300mm in height

Very High - growth >700mm in height and or plants high in volatile oils

Special consideration should be given to areas that contain layered vegetation which have the ability for fire to spread from understorey to tree canopies.

5.1.5 Position of fuel

For fires started by rolling stock or track maintenance activities, the fuel adjacent to the track is more likely to be the ignition source than anywhere on the rail reserve, therefore the closer the track, the higher the risk. The following areas shown in Figure 1 define the ratings assigned.

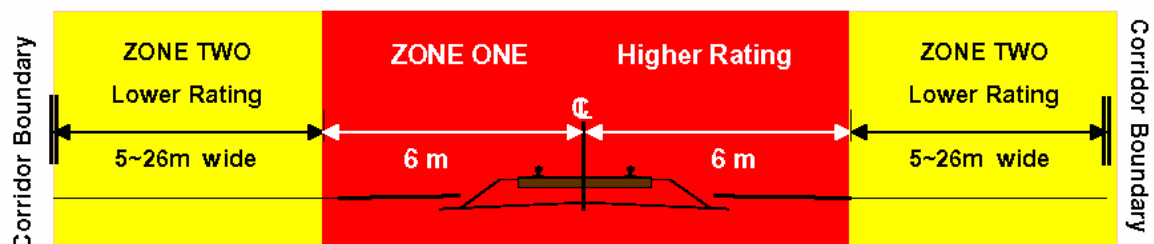


Figure 1 Zone Classification for Categorising Position of Fuel

An additional benefit in controlling fuel in zone one is that the track itself will add to the width, giving an effective firebreak of 12m.

5.1.6 Populated areas and asset proximity

Urban areas and regional towns neighbouring a rail corridor increase the level risk regarding the safety to people and economic risk significantly. It should be noted that these areas within townships (or within 200m) should be automatically assigned a priority one rating. Other factors that are not so apparent must also be considered such as previous history of fires in that region (increases the likelihood) - this is where the relevant Fire Authorities advice can be of great value.

5.1.7 Overall rating

Once fuel level, position and asset proximity ratings have been assigned an overall priority rating can be given using the following matrix:

				Level of Fuel			
				L	M	H	VH
Position of hazard	Zone 1	Asset Proximity	<200m	1	1	1	1
			>200m	3	2	2	1
	Zone 2	Asset Proximity	<200m	1	1	1	1
			>200m	3	3	2	2

5.1.8 Re-assessment of fire hazards prior to the declared fire danger period

An annual survey of the rail reserve is to be conducted at least 6 weeks prior to the expected Declared Fire Danger period (usually Dec 1st) each year. The purpose of the survey is to re-assess the effectiveness of the fire prevention works completed to date and re-evaluate the extent of fuel load left on the reserve and the risk it poses. Planned fire prevention works that have not been completed due to unfavourable weather and/or poor site conditions should also be identified and recorded in order to plan necessary follow-up works. It is recommended that the surveys be performed by personnel who have sufficient training¹ (preferably with a CFA representative if available) that is able to competently identify, categorise and record hazards. Once the survey is complete and hazards have been recorded, the risk matrix in Figure 1 should be used to prioritise an annual works plan.

5.1.9 Reporting

Upon completion of the fire hazard reassessment survey, the Corridor Manager Victoria or delegate will make the necessary modifications to the annual plan of works, again based on the order of priority. This plan is to be submitted by the Corridor Manager Victoria or delegate to the DOI at the beginning of each fire season. Progress against the plan is reported to the DOI monthly for the duration of the fire season.

5.2 Developing Annual Works Plans for Fire Prevention

5.2.1 Methodology

Some methods that may appear to be effective in removing fuel loads in the short term may introduce long term problems such as increased weed growth. A rail reserve consisting of bare earth fence to fence may be desirable but is not sustainable. Unless continually treated, soil will not stay bare for long; weeds will re-emerge quickly. The key is to manage the vertical and horizontal continuity and quantity of fuels. Remediation techniques such as fuel reduction burning and the use of herbicide are preferred over the mechanical removal methods such as grading and ploughing because there is less soil disturbance.

¹ The level of "sufficient training" is still a point of conjecture. The CFA may not always be available to provide assistance in every area of ARTC's rail network. The survey requires a person with an accepted level competence that will satisfy criteria demanded by the worst case scenario, i.e. appearing in a coroner's court to give evidence to support their assessment. With respect to this the surveyor may need training from the CFA to achieve accreditation to carry out the survey.

5.2.2 Environmental considerations

Environmental considerations must be taken into account when forming annual works plans. Penalties may be incurred under the FFGA Act if native vegetation is removed without a permit during the undertaking of new work or the expansion of existing fire breaks (a contact for permit applications is provided at the back of this document).

For Protected Areas and Areas of Environmental Significance a preferred method of fuel reduction needs to be developed in consultation with the Department of Sustainability and Environment representative from the relevant area.

Vehicles that traverse areas that contain known environmental weeds, particularly those that are declared as state and regionally prohibited species, should carry out wash down procedures to avoid infestation into other areas. Owners of vehicles that fail to comply may be faced with on the spot fines issued from Department of Primary Industries Officers empowered by the Catchment and Land Protection Act 1994.

5.3 Implementation of Fire Prevention Works

Upon identifying fire hazards and selecting remediation techniques to mitigate them, the Fire Prevention Works Plan should be completed so that the work can be budgeted, scheduled and implemented. The majority of fire prevention works should be targeted for completion before the declared Fire Danger Period of each year, however due to access restrictions in wet areas, some works may continue during this period. Once completed, the Fire Prevention Works Plan shall be submitted to the Alliance Management Team (AMT) for review and approval to proceed with the works.

5.4 Contractor Requirements

All ARTC's maintenance contractors and construction contractors will be required to develop Fire Management Plans specific to their works with ARTC and to ensure that all their personnel working on ARTC infrastructure are trained in the implementation of the applicable Fire Management Plans.

The Fire Management Plans are to conform to the requirements of the Country Fire Authority Act and the MFB Act and all relevant Statutory Regulations and, at a minimum, are to address the following items:

- Location and contact details of fire brigades responsible for fire control in the vicinity of the work site.
- Contact details for ARTC.
- Clear instructions regarding -
 - the actions to be taken should a fire be started by maintenance works.
 - the actions to be taken should a fire be discovered by maintenance workers.
 - restrictions on the lighting of fires and on works likely to start fires during a declared Fire Danger Period.
 - restrictions on the lighting of fires and on works likely to start fires during a declared Total Fire Ban.
 - restrictions on the use of vehicular and non vehicular heat engines during a declared Fire Danger Period.
 - restrictions on the use of vehicular and non vehicular heat engines during a declared Total Fire Ban.

5.5 High Fire Risk Activities

For high fire risk activities (eg welding, grinding or any activity likely to cause sparks) the Fire Management Plan is to include a comprehensive plan detailing any restrictions to activities during the Fire Danger Period and on Total Fire Ban days, contingency plans in the case of a fire being started including, but not limited to, required liaison with the local Fire Authority, required vegetation free area around work site, required fire fighting equipment (water tankers) to be on site at any time, required training to operate fire fighting equipment, required inspections to locate fires and required communications equipment.

5.6 Access for Fire-fighting Vehicles

To assist with the provision of emergency response access, where practicable, ARTC will endeavour to maintain existing access tracks to a standard trafficable by the local Fire and Environmental Authorities during the summer months. In some areas, this access will be along the bare earth firebreak.

5.7 Security of the Rail Reserve

While deliberately or naturally caused (e.g. lightning) fires on the rail reserve are impossible to totally eliminate, ARTC recognises the importance of taking all practicable steps to avoid and control such occurrences.

Train crews, employees and all contractors are required to immediately notify ARTC Train Control of any trespassers they observe on the rail reserve. Where appropriate, Train Control will refer the information to the local Police.

Fuel reduction works will also be undertaken in urban areas and any hotspots identified by the local Fire Authorities or ARTC (areas with a high incidence of deliberately lit fires) will be referred to the local Police.

5.8 Liaison

To ensure that the Fire Prevention Plans prepared annually are appropriate ARTC, (through its various representatives) will consult with the relevant local Fire Authorities brigades regarding the planned works. This will enable the Local Fire Authorities to provide feedback to ARTC on the Fire Prevention Plans and on the effectiveness of previous works. In addition it will allow for some cooperation between the local Fire Authorities and ARTC regarding burning-off activities.

In addition to the above, ARTC (through its various representatives) will attend key CFA/Municipal Fire Prevention Committee Meetings in the relevant CFA/Municipal regions. ARTC will use these meetings as a means to present the Fire Prevention Plan to the CFA/MFPO's and receive feedback on the Plan.

5.9 Reporting and Auditing

Prior to the commencement of the fire season each year the Corridor Manager Victoria will issue annual fire precaution instructions to maintenance staff. As a part of this process lists of emergency contacts will be updated. Once this process is completed a copy of the updated emergency contact list will be forwarded to the DOI (EMPC).

Once the Fire Prevention Plan has been prepared, the Corridor Manager Victoria or delegate will submit the Plan to the Office of the Director of Public Transport, Safety & Asset Management Branch and subsequently report on progress on the implementation of the fire prevention works in monthly intervals during the declared fire danger period.

Internal audits of the implementation of the ARTC Fire Management Plans will be performed annually. At the conclusion of the fire danger period, the effectiveness of the fire prevention works will be reviewed and appropriate changes noted for inclusion in the following year's Plan.

5.10 Contact Information

For any queries related to this document please contact:

ARTC Geotechnical and Environmental Standards Engineer: Wayne Potter

Phone (08) 8217 4257

Email: wpotter@artc.com.au

To obtain a permit for removing native vegetation please contact:

Sue Hadden (DSE)

Phone (03) 9296 4621

For enquiries regarding ARTC fire prevention works in the State of Victoria please contact:

ARTC Corridor Manager Victoria: Steve Garner

Phone (03) 8624 0888

Email: sgarner@artc.com.au

The DOI/PTD contact responsible for managing Victorian Public Transport Fire Management legal obligations is;

Terry Spicer

Manager Operations and Emergency Management - Safety & Asset Management Branch,
Public Transport Division - Department of Infrastructure

Phone (03) 9655 6422

Email: terry.spicer@doi.vic.gov.au

Appendix A: Hazard Identification & Risk Assessment

Example Hazard Categories are based on AS/NZ 4360

Area/Workplace:	Rail Corridors in Victoria	Team Members:	W.Potter (ARTC), J.Thomson (PN), L.Leslie (CFA), E.Jacobs (MAV), T.Spicer (DOI -PTD)
Activity:	Fire Management	Date:	19/7/05

		CONSEQUENCES				
		1	2	3	4	5
PROBABILITY	5	M	H	H	E	E
	4	M	M	H	H	E
	3	L	M	M	H	H
	2	L	L	M	M	H
	1	L	L	L	M	M

Probability (P)

- 5 - common or repeating occurrence (1yr)
- 4 - known to occur or "It has happened" (3yr)
- 3 - could occur, "I've heard of it happening" (10yr)
- 2 - not likely to occur (100yr)
- 1 - practically impossible (10,000 yr)

Consequences (C)

People

- 5 - fatality or permanent disability
- 4 - lost time injury or illness
- 3 - medical treatment
- 2 - first aid treatment
- 1 - incident report only

Network

- 5 - potential loss of accreditation
- 4 - major disruption to interface services
- 3 - disruption to services
- 2 - minor delays
- 1 - incident report

Economic

- 5 - > \$10m
- 4 - \$1m - \$10m
- 3 - \$100,000 - \$1m
- 2 - \$10,000 - \$100,000
- 1 - < \$10,000

E=Extreme H=High M=Moderate L= Low

Appendix A: Hazard Identification & Risk Assessment

#	Task or Hazard Category	Hazards (identified in the area or plant)	Current Controls	Potential Risk			Additional Controls Required	Revised Risk			By Whom	By When
				C	P	Rank		C	P	Rank		
1	Infrastructure (track)	Bushfire from outside corridor	<ul style="list-style-type: none"> Existing bare earth breaks (access track) On track spraying Additional track inspections 	P 1 N 4 E 4	2	L M M	<ul style="list-style-type: none"> Reduce fuel (fence to fence) on corridor in areas identified as high risk New bare earth breaks where required (access track) Consultation with local stakeholders on planting appropriate species (Generally lower fuel loads – greener in summer) 					
2		Fires caused from rolling stock	<ul style="list-style-type: none"> Preventative maintenance on rolling stock Existing bare earth breaks (access track) On track spraying Speed restrictions in peak times of fire danger period (WOXO/ WOLO) Additional track inspections Seasonal embargo on steam locomotives Communication Protocols 	P 2 N 2 E 2	4	M M M	<ul style="list-style-type: none"> ARA Guidelines New bare earth breaks where required immediately next to track (access track) Reduce fuel (fence to fence) on corridor in areas 					
3		Fires started from arson & lightning	<ul style="list-style-type: none"> Reduce access by public (fencing and train driver reports) Reporting systems for trespass Slashing around towns Bare earth breaks 	P 3 N 3 E 3	4	H H H	<ul style="list-style-type: none"> Public education 					
4		Hotworks (welding, grinding, etc)	<ul style="list-style-type: none"> Safety policies/procedures in place for hotworks Compliance with s.50 with the CFA Act 	P 2 N 2 E 1	4	M M M						

Appendix A: Hazard Identification & Risk Assessment

#	Task or Hazard Category	Hazards (identified in the area or plant)	Current Controls	Potential Risk			Additional Controls Required	Revised Risk			By Whom	By When
				C	P	Rank		C	P	Rank		
5	Infrastructure (rolling stock)	Bushfire from outside corridor	<ul style="list-style-type: none"> Reduce fuel on corridor (fence to fence) Bare earth breaks Emergency Plans and Procedures 	P 4 N 4 E 4	2	M M M						
6		Fires caused from rolling stock	<ul style="list-style-type: none"> Bare earth breaks immediately next to track Preventative maint. On rolling stock Speed restrictions in peak times of fire danger period (WOXO/ WOLO) Seasonal embargo on steam locomotives Communication Protocols 	P 2 N 3 E 3	2	L M M	<ul style="list-style-type: none"> ARA Guidelines 					
7		Fires started from arson & lightning	<ul style="list-style-type: none"> Reduce access by public Reporting systems for trespass Slashing around towns Bare earth breaks 	P 3 N 3 E 3	2	M M M						
8	Infrastructure (signalling)	As per infrastructure (track) hazards, but includes the following	<ul style="list-style-type: none"> Some bare earth breaks around signalling assets Fault in signalling automatically detected in some areas of network 				<ul style="list-style-type: none"> Improving bare earth breaks around signalling assets Planned upgrade of signalling will improve detection 					
9		Bushfire from outside corridor	As above	P 1 N 4 E 4	2	L M M						
10		Fires caused from rolling stock	As above	P 2 N 3 E 3	2	L M M	<ul style="list-style-type: none"> ARA Guidelines 					

Appendix A: Hazard Identification & Risk Assessment

#	Task or Hazard Category	Hazards (identified in the area or plant)	Current Controls	Potential Risk			Additional Controls Required	Revised Risk			By Whom	By When
				C	P	Rank		C	P	Rank		
11		Fires started from arson and lightning	As above	P 2 N 3 E 3	3	L M M						
12		Hotworks (welding, grinding, etc)	As above	P 2 N 2 E 2	2	L L L						
13	Infrastructure (other structures-buildings, stations etc)	As per infrastructure (track) hazards, but includes the following	<ul style="list-style-type: none"> • Suppression systems around buildings • Compliance with hazard material storage requirements 									
14		Bushfire from outside corridor	As above	P 3 N 2 E 3	2	M L M						
15		Fires caused from rolling stock	As above	P 3 N 2 E 3	2	M L M						
16		Fires started from arson and lightning	As above	P 2 N 3 E 3	4							
17		Hotworks (welding, grinding, etc)	As above	P 2 N 2 E 3	2	L L M						
18	Infrastructure (bridges)	Bushfire from outside corridor		P 2 N 4 E 4	4	M H H						

Appendix A: Hazard Identification & Risk Assessment

#	Task or Hazard Category	Hazards (identified in the area or plant)	Current Controls	Potential Risk			Additional Controls Required	Revised Risk			By Whom	By When
				C	P	Rank		C	P	Rank		
19		Fires caused from rolling stock		P 3 N 4 E 4	3	M H H	<ul style="list-style-type: none"> ARA Guidelines No stopping on bridges if rolling stock fire suspected Fuel reduction under/around bridges 					
20		Fires started from arson		P 2 N 4 E 4	2	L M M						
21		Hotworks (welding, grinding, etc)		P 2 N 4 E 4	2	L M M						
22	Adjacent properties (regional)	Fires caused from rolling stock	<ul style="list-style-type: none"> Existing bare earth breaks immediately next to track Preventative maint. On rolling stock Speed restrictions in peak times of fire danger period (WOXO/ WOLO) Seasonal embargo on steam locomotives Communication Protocols 	P 5 N 3 E 4	4	E H E	<ul style="list-style-type: none"> ARA Guidelines IMFMP liaising/consultation Formation of agreed annual fuel reduction works program 					
23		Fires started from arson & lightning within corridor	<ul style="list-style-type: none"> Reduce access by public Reporting systems for trespass Slashing around towns Bare earth breaks 	P 5 N 3 E 4	4	E H H	<ul style="list-style-type: none"> IMFMP liaising/consultation Formation of agreed annual fuel reduction works program 					
24		Hotworks (welding, grinding, etc)	<ul style="list-style-type: none"> Safety policies/procedures in place for hotworks Compliance with s.50 with the CFA Act 	P 2 N 2 E 2	2	L L L						

Appendix A: Hazard Identification & Risk Assessment

#	Task or Hazard Category	Hazards (identified in the area or plant)	Current Controls	Potential Risk			Additional Controls Required	Revised Risk			By Whom	By When
				C	P	Rank		C	P	Rank		
25	Adjacent properties (urban)	Fires caused from rolling stock	<ul style="list-style-type: none"> Bare earth breaks immediately next to track Preventative maint. On rolling stock Speed restrictions in peak times of fire danger period (WOXO/ WOLO) Seasonal embargo on steam locomotives Communication Protocols 	P 3 N 4 E 5	4	H H E	<ul style="list-style-type: none"> ARA Guidelines Formation of agreed annual fuel reduction works program 					
26		Fires started from arson & lightning within corridor	<ul style="list-style-type: none"> Reduce access by public Reporting systems for trespass Slashing around towns Bare earth breaks 	P 3 N 4 E 5	4	H H E	<ul style="list-style-type: none"> Formation of agreed annual fuel reduction works program 					
27		Hotworks (welding, grinding, etc)	<ul style="list-style-type: none"> Safety policies/procedures in place for hotworks Compliance with s.50 with the CFA Act 	P 2 N 2 E 2	2	L L L						