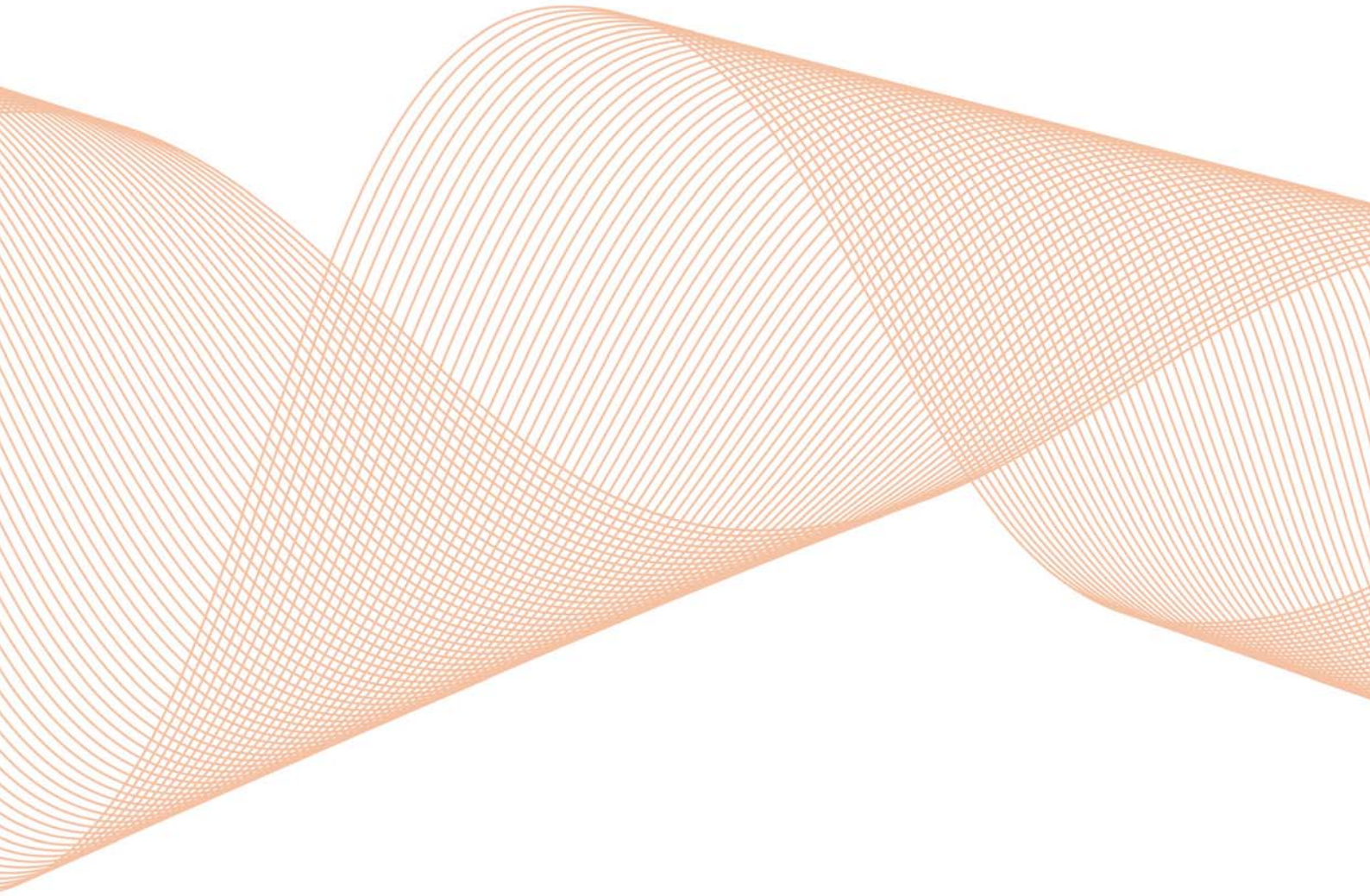
Appendix U.1 – Bushfire Management Plan

September 2011



Bushfire Management Plan

Original Issue: May 2011

Prepared by: Network Performance Branch

This Revision: July 2011

Date for Next Review: June 2012

ABN 18540492861

Document Control

Endorsement Approvals

	Name	Title	Signature
Endorsed by	Ankur Maheshwari	Manager, Network Performance	
Approved by	Mark De Laeter	General Manager, Networks	

Record of Revisions

Revision number	Date	DM version	Revised by	Description
1	31/05/11	1	Rob Cross	Original converted from pdf
1	20/7/2011	1A	Derek Perkins	Editorial changes
2	9/8/2011	2	Derek Perkins	Rewrite to 'enable' BMIP
3	26/8/2011	3	Tony Baird	Approved Version

Documents Referenced In This Document

DM#	Title of Document
8252110	BushFire Mitigation Implementation Plan 2011/2012
	Refer to Appendix A

Other Documents That Reference This Document

DM#	Title of Document
8252110	BushFire Mitigation Implementation Plan 2011/2012

Stakeholders (people to be consulted when document is updated)

Position / Branch / Section
See List in DM# 8252110 Bushfire Management Implementation Plan 2011/2012

Notification List (people to be notified when document is updated)

Position / Branch / Section
See List in DM# 8252110 Bushfire Management Implementation Plan 2011/2012

Contents

1 Introduction

1.1 Context

Western Power transports electricity from generators to customers via the Western Power Network[1]. Figure 1 shows the transmission and distribution networks coverage within Western Australia. This large area extends from Kalbarri in the north, to Albany in the south and to Kalgoorlie in the east. The total area serviced by the SWIS is 257,800 km^2 and the total perimeter is 3,761 km.

Approximately 75% of the network consists of bare overhead conductor traversing habituated areas, bush land or vegetated areas.

Figure 1: Western Power Network

Western Australia's long dry summer, with the hot weather and winds typically extending from November to April each year, creates conditions that often lead to bushfires ('the bushfire season').

Bushfires may result from:

- lightning, acts of vandalism, human error and other phenomena which acts as a source of ignition in the proximity of dry vegetation; or
- Western Power's network assets

Whilst Western Power's network has the potential to be the source of ignition, the majority of bushfires are caused by non Western Power network assets.

[1] DM# 8088307 Electricity Networks Access Code 2004 –page 33

Bushfires:

- increase public safety risks
- can cause property damage and environmental impacts
- can damage Western Power's network infrastructure

This in turn can impact critical local community services such as water pumping and communication facilities that are essential in fighting fires and protecting communities in general.

1.2 Purpose

The purpose of this bushfire management plan (Plan) is to:

- prevent Western Power's network from being the source of ignition of bushfires
- manage the risks to Western Power's network due to bushfires

The objective of this Plan should reduce the risks to:

1. public and personnel[2] safety – by operating and maintaining the network to reduce the number of fires initiated by Western Power's network
2. Western Power's network – by designing, operating and maintaining the network such that the impact of bushfires on the network is minimised
3. Western Power's business – by achieving the above two

1.3 Plan Ownership and Governance

Network Performance Branch (Networks Division) in Western Power is responsible for preparing, maintaining and monitoring the Plan and retains ownership of the Plan.

Intra annual modifications to this document are approved by the Manager of Network Performance in consultation with stakeholders indentified in sub-section "stakeholders" of the Document Control Section. Governance of this annual plan is as outlined in the sub-section "Endorsement Approvals" of the Document Control section. The parties nominated in the notification list in the Document control Section will be notified of any change or revision to the Plan. The next annual update will be completed by July 2012.

1.4 Scope

The Plan covers the all aspects of bushfire management relating to the Western Power Network. Specific programs of work are enabled by this Plan and individually outlined in the Bushfire Mitigation Implementation Plan (BMIP).

Management strategies and controls enabled by this Plan include:

- bushfire risk assessment and network mapping

[2] Western Power staff, contractors and Fire and Emergency Services Authority (FESA) personnel

- risk reduction strategies for public safety
- bushfire related management functions
- public awareness strategy for bushfire Protection
- benchmarking with other electricity utilities to discuss the latest developments in bushfire mitigation

1.5 Plan Fit in Strategic Asset Management Documentation

This Plan is a key strategy document and an integral part of the suit of strategic asset management documents. It is used to communicate Western Power key bush fire mitigation strategies to the external stakeholders. The BMIP summarises annual targets for various bush fire mitigation projects, including their budgets and time frames.

1.6 Community Safety Strategy

The Bushfire Management Plan contributes to Western Power's overarching Community Safety Strategy. The purpose of the Community Safety Strategy is to establish a framework of standards, processes, strategies and accountabilities for managing the community safety risk posed by Western Power's business.

2 Bushfire Risk

Whilst the bushfire risk exists throughout the network, the likelihood and consequence of bushfire incident varies. Western Power has limited resources[3] to mitigate the risks associated with bushfires. These resources are therefore required to be allocated commensurate with the level of risks.

Safety, financial, community and business impacts are the main drivers considered in the evaluation of risk.

2.1 Bushfire Risk Assessment and Network Mapping

Western Power uses the Australian Standard (AS 4360) for bushfire risk assessment. This assessment measures bushfire risk in the areas traversed by the network using considerations of bushfire likelihood and consequence.

The bushfire risk due to Western Power's network is calculated using:

- the location of all network assets recorded in Western Power's geographic information systems; and
- any infrastructure, habitation, land and business value in the vicinity of Western Power's network, together with geographical contours

Western Power has partnered FESA and the Department of Environment and Conservation (DEC) on a Bushfire Threat Analysis (BTA) project for Western Australia. The primary aim of the BTA is to improve the quantification of bushfire risk factors across Western Australia. The BTA is updated on an annual basis and is an input to the annual bushfire preparedness program of works.

In 2003, Western Powers' maintenance zones were classified in accordance with the then BTA data as either Extreme, High, Moderate or Low fire risk maintenance zones.

These maintenance zones, are traversed by approximately 68,606km (route length) of overhead conductor. There is 58,814km (circuit length) of conductor in maintenance zones with fire risks zones designated Extreme, High and Moderate.

Figure 2, shows a map of Western Power's maintenance zones by fire risk ranking. These fire risk (maintenance) zones influence Western Power's approach to asset management (planning, operation, maintenance and prioritisation). FESA and DEC have endorsed Western Power's Bushfire Risk Assessment. All mitigation strategies arising out of this plan are prioritised by the fire risk zones.

[3] Financial and human resources

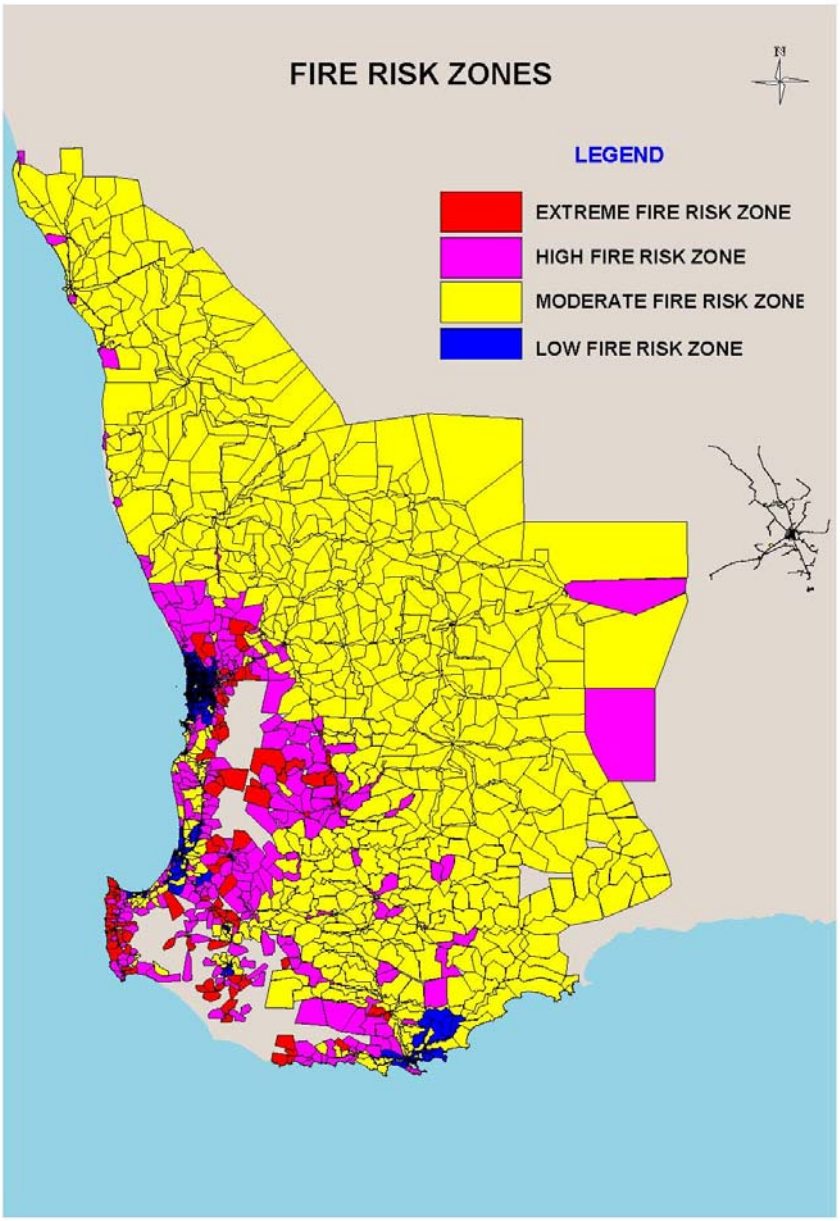


Figure 2: Fire Risk Zones

2.2 Risk Reduction Strategies for Public Safety

Western Power prioritises all work programs as outlined in the Network Investment Strategy[4] (including bushfire mitigation). Some competing expenditure areas include:

- meeting forecast customer demand growth
- sustaining and/or improving service levels
- sustaining and/or improving security of supply

[4] DM# 7314528 Network Investment Strategy

Overlaid on the constraint of affordability for Western Power, its customers and the business owner (the Western Australian Government), the risk of not being able to deliver the required work was also taken into account, particularly in profiling the expenditure within any regulatory period.

To improve public safety, expenditure related to critical risks in the areas of public safety, bushfires, maintenance backlog, pole failures and network security have been given priority. The risk reduction strategy flows from the Bushfire Area Risk Assessment. The primary public safety objective of these strategies is to reduce bushfire ignition caused by network assets, plant, equipment or employee/ contractor action.

The secondary objective of these strategies is to minimise the impact of asset damage from bushfires, which may occur in the vicinity of network assets.

Asset related bushfire mitigation strategies are as outlined below.

2.2.1 Asset Maintenance Strategy

The primary preventative maintenance strategy for line assets is based on a program of specified inspection and condition monitoring.

Asset inspection programs monitor the condition of these assets and record details of equipment condition within Western Power's asset condition monitoring systems. The required periods for asset inspection and asset replacement are contained in the asset missions/strategies.

Asset inspections include inspections for poles, as well as underground and overhead hardware integrity, which are undertaken in accordance with established plans, procedures and instructions.

Instructions include features to be observed in assessing asset condition and detailed descriptions of items that need to be identified for replacement or maintenance.

2.2.2 Wires Down Mitigation Strategy

Wires, also called 'conductors', are a metal material capable of carrying an electrical current. When wires break and fall down, dry vegetated undergrowth may ignite and start bushfires. The strategy is to accelerate the replacement of rusted or corroded wires in areas of extreme and high bushfire risk.

2.2.3 Pole Down Mitigation Strategy

Falling poles may result in a fire by bringing live electrical equipment into contact with dry vegetated undergrowth. To mitigate this, a condition based inspection procedure determines if a pole is to be reinforced or replaced.

Western Power has been progressively enhancing its management practices across the end to end value chain. In 2010, a new Wood Pole Management Plan was developed with the objective of reducing risks associated with unassisted pole failures. The Plan draws from best practice in the Australian industry to define the actions required to

meet the performance targets set. The plan is updated regularly with the 2011 update scheduled for August.

2.2.4 Conductor Clashing Mitigation Strategy

Conductor clashing causes sparks which have been known to cause bushfires. Strategies to mitigate clashing conductors form part of this plan.

2.2.5 Vegetation Maintenance Strategy

Western Power undertakes vegetation maintenance programs to maintain clearances between vegetation and network assets. If vegetation comes into contact with electrical assets, the vegetation can burn and start bushfires,

The vegetation maintenance strategy is to undertake vegetation management based on the bushfire area risk assessment.

Transmission and distribution vegetation maintenance in Extreme and High Fire risk areas is to be completed by November 30 of each year.

Distribution asset vegetation maintenance in Moderate Fire Risk areas are on a two-year inspection cycle and Low Fire Risk areas are on a three-year inspection cycle for distribution assets.

Transmission asset vegetation maintenance in Moderate and Low Fire Risk areas is to be completed by the end of each financial year.

This vegetation strategy will also minimise bushfire damage to Western Power assets by reducing fuel loads in the vicinity of fuse pole bases and provide effective vegetation clearance from assets to help prevent heat damage from adjacent fires.

2.2.6 Pole Top Fire Mitigation Strategy

Pole top fires result in system faults and can cause bushfires by pole top equipment or sparks falling to the ground and igniting vegetation.

The application of silicone coatings on High Voltage pole top insulators, in Extreme and High bushfire risk areas, is an established strategy for preventing pole top fires and will be continued.

In addition to the silicone program, distribution unserviceable poles and/or cross-arms will be replaced with steel cross-arms and polymer insulators. For transmission, polymer insulators are used instead of wooden cross-arms. These new construction types are less likely to cause pole top fires.

2.2.7 Operations Strategy

A Bushfire Reporting Process, jointly developed by Western Power and FESA, has been implemented to improve safety for fire crews fighting fires in the vicinity of Western Power assets. The process streamlines communication between FESA and Western Power to enable the fire crews to work safely and efficiently with Western Power to fight bushfires.

Western Power also uses Bureau of Meteorology weather information that identifies high and extreme bushfire risk days. Operating

procedures for high bushfire risk days are followed on days of high and extreme bushfire risk.

Days of total fire ban are declared in situations of extreme weather and other environmental conditions, which are conducive to the ignition and spread of bushfires. Procedures and work instructions for days of total fire ban incorporate arrangements for:

- liaison between Western Power and FESA
- communication with the affected community
- communications with emergency groups
- response to emergency situations resulting from network damage or failure
- authorised actions where they result in the interruption of electricity supply to customers
- network protection and recloser action to minimise 'let through' energy on days of total fire ban
- obtaining permits relevant to work activities on days of total fire ban

2.2.8 Work Practices Strategy

Unsafe work practices by Western Power crews or its contractors may ignite surrounding vegetation and cause bushfires.

Western Power has documented instructions and provides training of work crews for working in bushfire prone areas and during days of total fire ban.

This includes instructions for the use of motor vehicles and combustion engines and the fire fighting equipment to be carried.

2.2.9 Design and Equipment Standards Strategy

Western Power investigates long-term design improvements, equipment improvements and new technologies. Design and equipment standards are updated accordingly.

The strategy is to place a high weighting on designs and equipment that provide low likelihood of initiating fire and have high resistance to fire in Extreme and High bushfire risk areas.

New technologies that reduce ignition likelihood and/ or are fire resistant are assessed for effectiveness and value. New technologies assessed include:

- Fire Safe fuse devices
- Fire Safe Surge Arrestors
- Fire Safe conductor and construction types
- fire retardant paint on wooden poles

2.2.10 Planning Strategy

Planning strategies adopted for avoiding fire starts and protecting assets from bushfires include:

- re-routing lines away from bushfire risk areas
- under-grounding new or replacement lines
- adopting fire resistant and fire safe overhead line designs, including supply lines critical to safety and community interests

The above planning strategies are considered within the constraints of affordability and competing priorities for Western Power, its customers and the business owner (the Western Australian Government).

2.3 Bushfire Related Management Functions

The following management functions have been identified as key requirements that need to be addressed for effective management of bushfire mitigation activities.

2.3.1 Investigations Strategy

Western Power monitors fault/fire incident statistics to determine trends and highlight network damage or faulty equipment in need of repair or replacement.

Bushfire-related incidents are investigated to recommend immediate and long-term bushfire mitigation action.

2.3.2 Insurance Management

Insurance management is an ongoing essential management function linked to the mitigation of bushfire risk. Western Power insurance representatives attend Bushfire Management meetings and are consulted regularly so that mitigation strategies are communicated to Insurers.

2.3.3 Managing the Impacts of Legislation

Western Power's liability under common law for damage or injury arising from bushfires initiated by its assets has to be managed. The extent of this liability will depend on the circumstances in each case.

Other relevant legislation which must be considered includes the *Energy Operators (Powers) Act 1979*, *The Electricity Act 1945*, *Bush Fires Act 1954* and the *Electricity (Supply Standards and System Safety) Regulations 2001*.

2.3.4 Asset Management (Refurbishment/Replacement)

Asset Management Plans are produced annually to refurbish or replace equipment known to present a high ignition risk or identified as being vulnerable to significant damage.

2.3.5 Land and Environmental Management

This plan aligns management actions arising from the plan with environmental procedures and policies of Western Power, including the environmental policies and procedures related to planned and unplanned maintenance.

2.3.6 Fire Response Strategy for Bushfire Protection

The fire response strategy relies on the fast response and attendance of Western Power fire fighting crews to protect network assets faced with the threat of bushfire damage.

Protective dousing or clearing action can be taken before the bushfire reaches the network asset or even after the bushfire has passed through.

This strategy has safety implications for Western Power personnel and must be coordinated with FESA.

The strategy requires:

- established co-operative working relationships with FESA and DEC and agreed protocols of Western Power behaviour at bushfire events
- effective communication links with other authorities (e.g. FESA and DEC) on the location and likely movement of bushfires
- fire fighting and fire equipment training of field repair crews

2.3.7 Accreditation and Training Strategy for Bushfire Protection

This strategy covers regular training and refresher training programs with the requisite accreditations needed to undertake effective asset inspection. This is required for both Western Power and contract employees.

The training and accreditation strategy enables the use of approved plant and equipment and the management and monitoring of contracts for effective maintenance and vegetation control.

2.4 Public Awareness Strategy for Bushfire Protection

A number of strategic initiatives, including media campaigns, notes on electricity accounts and the Western Power website, are used to inform the public of:

- the potential fire risks associated with all aerial electric power lines
- the obligations of householders or landowners to prevent cultivated or tended natural vegetation from coming into contact with power lines
- the benefits of vegetation management at the start of the bushfire season
- the risks of planting inappropriate vegetation near electrical lines

- vegetation species suitable for planting near and below power lines
- potential hazards of fire fighting activities near power lines and transmission lines

2.5 Benchmarking and the Victorian Bushfires Royal Commission

Western Power regularly liaises with electrical utilities in Australia to discuss latest developments in bushfire mitigation. In 2011 Western Power entered into a formal bushfire mitigation benchmarking arrangement with Powercor, a Victorian utility. This benchmarking arrangement enables a structured exchange of bushfire mitigation information and experiences.

Additionally, Western Power closely monitors outcomes and findings from the Victorian Bushfires Royal Commission (VBRC). A key outcome of the VBRC is the establishment of the Powerline Bushfire Safety Taskforce.

The Powerline Bushfire Safety Taskforce will deliver a final report to the Victorian Government in September 2011. Western Power will consider the full report and make changes as appropriate to its own Network, taking into consideration asset and environmental conditions in Western Australia.

3 Management Reporting

Management reporting informs management of the performance of the network and Western Power's preparedness for the fire season.

3.1 The Asset Initiated Fires Register

The reporting system records all incidences of fire ignition caused by electricity assets through the Trouble Call System (TCS), Electricity Supply Emergency Notification (ESEN) and Risk Management claims. Summarised monthly reports on bushfire performance are tabled at the "Board" on a quarterly basis.

3.2 Bushfire Season Preparedness Index

Western Power has established a Bushfire Season Preparedness Indicator to determine bushfire readiness each year. This is a lead indicator that provides a pre-bushfire season risk indicator on the following areas:

- Vegetation in Extreme and High Bushfire Risk areas to be cut by November 30 of each year
- Fuse pole clearing in Extreme and High Bushfire Risk areas completed by November 30 of each year
- Priority One and Two maintenance conditions in Extreme and High Bushfire Risk areas that are directly bushfire related completed by November 30 of each year

4 Definitions and Acronyms

Table 1: Definitions

Term	Definition
Asset Mission	The purpose of an asset, its performance measures and a maintenance and renewal strategy for the particular asset class.
Bushfire	This is a general term, uniquely used by Australians, and includes grass fires (including paddock fires), forest fires and scrub fires, i.e. any fire outside the built up urban environment. Also sometimes known as a wildfire (Environmental Protection Authority 2004).
Bushfire Threat Analysis	Bushfire Threat Analysis is a structured approach used to analyse the bushfire threat for a particular area or nominated set of values and calculate a response or determine priorities for funding or action.
Bushfire Season Preparedness Indicator	A lead indicator that allows Western Power to assess its preparedness for the upcoming bushfire season.
Bushfire Season	The period from November to April annually.
Fire safe	Equipment that is deemed to be in a state that presents a low risk of bushfire ignition potential.

Table 2: Acronyms

Term	Definition
DEC	Department of Environment and Conservation
DM	Document Management
DFIS	Distributed Facilities Information System
DFMS	Distributed Facilities Management System
ESEN	Electricity Supply Emergency Notification
FESA	Fire and Emergency Services Authority
HV	High Voltage
LV	Low Voltage
NMS	Networks Mapping System
NIS	Network Investment Strategy
TCS	Trouble Call System
VBRC	Victorian Bushfires Royal Commission
WA	Western Australia
Wires	Wires, also called ‘conductors’, are a metal material capable of carrying an electrical current.

4.1 References

Legislation

- *Bush Fires Act 1954*
- *Conservation and Land Management Act 1984*
- *Fire and Emergency Services Authority of Western Australia Act 1998*
- *Fire Brigades Act 1942*
- *Forest Products Act 2000*
- *Occupational Safety, Health and Welfare Act 1996*
- *Environmental Protection Act 1986*
- *Energy Operators (Powers) Act 1979*
- *The Electricity Act 1945*
- *Electricity (Supply Standards and System Safety) Regulations 2001*

Appendix A. Western Power Policies Plans and Procedures

A.1 Corporate Policies, Plans and Procedures

DM# 3988967, Media Policy

DM# 7115840, Community Safety Strategy

DM# 5623764, Document Management Policy and Procedures

DM# 8418676, Environmental Policy

DM# 7481012, Safety and Health Policy

DM# 4721323, Safety and Health Emergency Response Procedure

DM# 3407808, Crisis Management Plan

DM# 3605511, Electricity Networks Access Code

A.2 Network Policies, Plans and Procedures

DM# 1044946, Transmission Substations Maintenance Policy

DM# 1044946, Transmission Lines Maintenance Policy

DM# 1195855, Transmission Planning Criteria

DM# 3771462, Distribution Planning Process

DM# 5403605, Western Power Environmental Policy

DM# 8132724, Wood Pole Inspection Procedure

DM# 3009109, Bushfire Risk Assessment Methodology

DM# 4791029, Strategic Vegetation Management Plan 2010 – 2012

DM# 8172520, Wood Pole Management Plan

DM# 6034312, Conductor Clashing Mitigation Strategy

A.3 Network Operating Plans, Manuals and Instructions

DM# 1190367, Transmission Emergency Management Plan

DM# 8410516, NOCC Emergency Management Reference

DM# 1717104, Vegetation Manual (Contractors Version)

DM# 1561294, Wood Pole Inspection Field Handbook

DM# 7209442, Switching Operators Manual