
Electricity Safety - Bushfire Mitigation Plan

Hazelwood Mine

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Authors: Multiple

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Title:	ENGIE Hazelwood Mine Bushfire Mitigation Plan
Author:	Peter Brimblecombe
Synopsis:	This document defines the processes and procedures used to mitigate the risk of bushfire caused by the overhead power lines under the control of ENGIE Hazelwood.
TRIM Reference No:	MF13/3

REVISION/CHECKING HISTORY

REV No.	AUTHOR	DATE	CHECKED BY	APPROVED BY
0	P Brimblecombe		C Morley	30 Sep 2010 R Polmear
1	P Brimblecombe		C Morley	S Kemsley
2	P Brimblecombe	7 Dec 2012	S Kemsley	7 Dec 2012 S Kemsley
3	P Brimblecombe	14 Jun 2013	S Kemsley	19 Jun 2013 D Day Jun 2013
4	P Brimblecombe	13 May 2014	S Dargan	May 2014 S Kemsley Jun 2014
5	P Brimblecombe	Jun 2015	S Kemsley	Jun 2015 S Kemsley Jun 2015
6	P Brimblecombe	Jun 2016	L Zajarski	Jun 2016 P Brimblecombe Jun 2016
7	P Brimblecombe	Oct 2016	P Brimblecombe	Oct 2016 P Brimblecombe Oct 2016

REVISIONS

REVISION NUMBER	DATE	DESCRIPTION OF CHANGE
0		Development of document from draft for approval
1		Update based on ESV clarifications, organisational change and document review process
2	7 Dec 2012	Update based on ESV clarifications and recommendations
3	19 Jun 2013	Review and update for proposed new regulations
4	12 May 2014	Review and update for current year
5	June 2015	Review to reflect recommendations and affirmations from Board of Inquiry's October 2014 report into the Hazelwood Mine Fire and update for current year
6	June 2016	Review and update for current year
7	Oct 2016	Update based on ESV clarifications and recommendations

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1. Purpose

Comply with the requirements of relevant Victorian legislation.

Relevant Legislation and Regulations

Electricity Safety Act 1998(Vic) (Version No 025)

Electricity Safety (Bushfire Mitigation) Regulations 2013 (Version No 62)

As a business that has electric lines above the surface of the land and in a hazardous bushfire area, ENGIE Hazelwood meets the definition of a “specified operator”.

2. Scope

This plan details the practices and procedures in place at ENGIE Hazelwood for the prevention of fire caused by overhead electrical assets and the mitigation of any fire incident that may occur. As most of the “at risk” electrical equipment is operated by the mine, the main responsibilities for this plan are with mine personnel.

3. Responsibilities & Authorities

3.1. Director of Mining:

- a) ensure that the processes and procedures required to comply with the applicable regulations are in place and followed;
- b) ensure that this Electricity Safety – Bushfire Mitigation Plan is reviewed and updated at regular intervals in line with legislation, regulations and industry “Best Practices”; and
- c) have an audit process in place to ensure that the regulatory requirements are being met.

3.2 Production Manager, Mine:

- a) ensure that all operational personnel and contractors understand their responsibilities in meeting this plan;

3.3 Manager Technical Compliance, Mine:

- a) ensure that this Electricity Safety – Bushfire Mitigation Plan is reviewed and updated annually to comply with the regulations and ensure that any changes to relevant operational procedures are compliant with the regulations and reflected in this Electricity Safety – Bushfire Mitigation Plan.

3.4 Asset Manager, Hazelwood:

- a) ensure that a copy of the current plan is submitted to Energy Safe Victoria annually before 1 July each year: and
- b) confirm that each submission gains ESV approval.

3.5 Manager Technical Compliance, Station:

- a) Ensure that the Power Station electrical equipment meets the requirements of applicable regulations.

4. Prescribed Particulars

a) The name address and telephone number of the specified operator:

- Name: ENGIE Hazelwood

- Address: Brodribb Road, Morwell VIC 3840
 - Phone No: (03) 5135 5000
- b) Person responsible for the preparation of the plan;**
Peter Brimblecombe,
A/ Technical Compliance Manager
Ph (03) 5135 5945
PO Box 195, Morwell, VIC 3840
- c) Person responsible for carrying out the plan;**
Stephen Dargan,
EC&I Senior Engineer, Mine
Ph (03) 5135 5876
PO Box 195, Morwell, VIC 3840
- d) Emergency contacts are the Mine High Voltage Availability Officers;**
Peter Brimblecombe,
A/ Technical Compliance Manager
Ph (03) 5135 5945/ mobile 0409 402 459
PO Box 195, Morwell, VIC 3840
OR
Stephen Dargan,
EC&I Senior Engineer
Ph (03) 5135 5876 / mobile 0408 588 372
PO Box 195, Morwell, VIC 3840

These officers are available during normal working hours and are rostered for out of hours duty. Each officer will accept calls whether rostered or not.

e) Fire Policies:

ENGIE Hazelwood manages and maintains its overhead lines infrastructure to ensure that the probability of the lines causing a fire is minimised in a known high risk environment.

Mine Fire Service Policy and Code of Practice

— Refer Paradigm Document Id 2589,

The key purposes of this *Mine Fire Service Policy and Code of Practice* are to:

- 1 Outline requirements for fire protection infrastructure (fixed and mobile) at the Hazelwood coal mine (**Mine**), in order to:
 - (a) Protect ENGIE Hazelwood employees and contractors (**Mine personnel**) and third parties attending the Mine in a fire emergency situation;
 - (b) Protect Mine plant and equipment and coal reserves in the event of a fire;
 - (c) Minimise fire-related disruptions to mining operations and electricity

generation in the Hazelwood Power Station (**Power Station**); and

- (d) Provide a means of promptly extinguishing fires at the Mine, in order to prevent the development of major coal fire giving rise to impacts on third parties and the environment.
 - 2 Outline requirements for electricity and water supply to the Mine's reticulated fire service system (**Mine Fire Service System**) – including design principles, and redundancies.
 - 3 Outline requirements for vehicles and mobile plant, fire breaks and vegetation management within the Mine, in order to reduce fire risks.
 - 4 Provide an overview of other Mine policies and procedures concerning fire prevention, mitigation and response.
 - 5 Ensure that the infrastructure at the Mine for fire prevention, mitigation and suppression meets industry best practice, and relevant operational requirements.
 - 6 Define procedures for the testing of any new fire prevention equipment or techniques which are proposed to be introduced at the Mine, in order to ensure suitability and safety.
- f) **The objectives of the plan;**

ENGIE Hazelwood needs its overhead lines infrastructure to not cause a fire in a known high risk environment. To ensure this the lines are regularly inspected, vegetation is removed well in excess of the minimum requirements (as per Electric Line Clearance Plan reference ID 50008) and a Maintenance Management System (Maximo) is used to track and manage the repair of identified faults.

*“(The) Mine Fire Service Policy and Code of Practice is prepared on the basis that a fire may occur in **any part** of the Mine – i.e. the Operating Areas, in the Worked Out Floor or in Worked Out Batters – or in the lands within the Mine boundary and outside the open cut section of the Mine. It aims to ensure that adequate fixed and mobile fire fighting infrastructure is available to reduce the risks of an outbreak of fire; and in the event of a fire, to enable it to be suppressed as quickly as possible, in order to minimise impacts on Mine personnel, plant, coal reserves, Mine and Power Station operations, and third parties and the environment.*

Different fire protection requirements are specified for the various areas of the Mine, based on the specific risks of the outbreak of a fire, and related risks to Mine personnel, plant and coal reserves, and the potential broader consequences should a fire occur (e.g. to third parties or the environment).”

g) **Plan of the mine showing overhead power lines;**

The whole site is in an area assigned a fire hazard rating of "high" by the Country Fire Authority.

Note: the “at risk” business power lines are shown in black. The other coloured lines on the map indicate overhead lines, on our site, owned by MECs

Drawing of mine showing all overhead power lines – Appendix 1

Site Locality Map - Appendix 2

h) **Preventative strategies;**

Local Electrical Instructions (Paradigm Document No. 3136)– section 5.6.17

- These instructions detail the maintenance practices relating to vegetation removal near, and external inspection of the ENGIE Hazelwood high voltage overhead line system in the mine within the specified 3 year time frame.

Vegetation is removed from the vicinity of Mine power lines whenever it is identified as an issue. This could be during routine inspections by trained Electrical Asset Inspectors or ad hoc inspections by mine electrical personnel during normal operating procedures. There is limited vegetation on site and clearances to power lines are much greater than the minimum requirements.

The power lines are routinely inspected by contracted inspectors. All faults are recorded into the maintenance management system by Hazelwood staff, and managed through, the Computerised Maintenance Management System (Maximo). This allows Hazelwood personnel to independently review all reported faults as an audit of the inspection work.

Because of the limited nature of the electrical network within the mine, all areas of the network are accessible at all times.

i) Plan for inspection;

All overhead high voltage power lines are inspected on a 3 year cycle. A contract is let annually for the inspection of a nominated portion of the mine distribution system and all limited life poles on site.

j) Accreditation of Lines Inspectors;

ENGIE Hazelwood does not directly employ linesmen. When the line inspections are due each year, an order is placed on an overhead lines service provider, for the inspection of the plant and equipment due that year.

The order requires the inspections be completed by persons with Certificate II accreditation in Asset Inspection (or equivalent as approved by ESV).

Inspector qualifications are checked by the person responsible for the contract, as part of the Contract Management Process (Reference documents ID 49509, 49510 & 49511), when the external inspector presents for access to the equipment. The Responsible Officer for the contract controls access to the site, monitors progress and checks on site activities.

l) Operation and Maintenance Plans for at-risk electric lines;

i) in the event of a fire:-

The Mine power distribution system (“at risk supply network”) is expected to operate without substantial impairment to ensure power supply is maintained to all plant. This may involve the utilisation of redundancies built into the system.

In line with the recommendations and affirmations in the October 2014 report of the Board of Inquiry into the Hazelwood Mine Fire, a number of additional safeguards and/or redundancies have been added to the Mine power distribution system.

In the event of a fire, any non-essential planned maintenance activity would likely be cancelled and all Mine personnel drawn into assisting with the fire response.

The *Mine Fire Service Policy and Code of Practice* (Paradigm Document No. 2589) details the requirements for the operation of electric lines to plant and pumping systems which supply the Mine’s reticulated fire service system.

In the event of a major fire within the business, the *Hazelwood Mine Emergency Response Plan* (Paradigm Document No. 2895) would be implemented and actions necessary to protect the Mine’s power systems would be directed by the Hazelwood Emergency Commander, or CFA Incident Controller with technical support from ENGIE Hazelwood personnel.

ii) during a day of Total Fire Ban:-

Any planned maintenance work on the power distribution system would be cancelled.

The Mine power distribution system (“at risk supply network”) is expected to operate without substantial impairment. This may involve the utilisation of redundancies built into the system.

In line with the recommendations and affirmations in the October 2014 report of the Board of Inquiry into the Hazelwood Mine Fire, a number of additional safeguards and/or redundancies have been added to the Mine power distribution system.

On a day of CFA-declared Total Fire Ban, any non-essential planned maintenance activity would be cancelled (and any essential maintenance which is proposed to proceed, risk assessed to ensure that it did not constitute a fire risk).

On most high and extreme fire risk days the protection of electricity supply and electrical substations (as critical Mine infrastructure), would typically be specifically detailed on a *Daily Fire Preparedness and Mitigation Plan*, issued under the *Hazelwood Mine Fire Instructions* (Paradigm Document Id No. 2758). This document is typically issued on the day prior to each day of Total Fire Ban, as well as internally assessed days of high fire risk for the Mine.

iii) during a fire danger period:-

All inspections and high priority maintenance work would have been completed prior to the start of the fire danger period to minimise fire risk due to the power distribution network. Any required vegetation removal will also have been completed.

The mine power distribution system (“at risk supply network”) is expected to operate without substantial impairment. This may involve the utilisation of redundancies built into the system.

In line with the recommendations and affirmations in the October 2014 report of the Board of Inquiry into the Hazelwood Mine Fire, a number of additional safeguards and/or redundancies have been added to the Mine power distribution system.

Due to susceptibility of coal mines to fire ENGIE Hazelwood declares a Fire Season for the Mine, independently of the CFA declared season (which typically takes effect some time prior to the CFA fire season). The declaration of a Mine Fire Season under the *Guidelines for Season and Period Specific Fire Preparedness and Mitigation Planning* (Paradigm Document Id No. 36546) initiates a series of preparatory measures within the Mine to ensure all protective equipment and systems are serviceable, and that necessary training and inspections have been conducted to implement a high level of preparedness.

Maintenance activities for the overhead lines assets are planned around the requirements for pumping systems supplying the Mines reticulated water system and operational plans for coal supply to the power station. All maintenance activities are risk ranked and prioritised within ENGIE Hazelwood’s computerised maintenance management system (Maximo).

m) Investigations, analysis and methodology to be adopted for the mitigation of the risk of fire ignition from at-risk electric lines:

All fires are reported and into Hazelwood’s Incident Management and reporting Procedure and investigated as per the business procedure (reference document ID 35510)

The electric lines for the business are designed to limit the risk of fire ignition.

This is achieved through several design initiatives which are not practical for the public distribution system.

1. There are no automatic reclose facilities enabled within the Mine. This limits the possibility of energising a damaged line without suitable inspection and monitoring of the situation.
2. All mine feeders are installed with Sensitive Earth Leakage protection to protect personnel and plant in the event of a fault. This system limits the amount of energy delivered to and time of operation of an earth fault. By limiting the duration and magnitude of fault current, the chance of a fault causing a fire is minimised. The power station high voltage overhead lines do not have this protection but are fully protected to ensure the safety and integrity of the plant to which they are connected.

3. All the mine high voltage overhead lines operate at 6,600V. The line hardware specified and used on all new installations is 22,000V hardware. This minimises the risk of an electrical fault that will cause a fire. The power station overhead lines operate at 220,000V but are of very short length and are located above concrete paved areas.
4. All operations of protection at the substations supplying power to the business overhead electric lines require a full inspection prior to the restoration of supply (Refer *Local Electrical Instructions*, Paradigm Document Id No. 3136).
5. Overhead electric line design is managed to minimise the number of crossovers (especially mid span crossovers) to limit the potential for conductor clash.
6. Changes to the high voltage overhead lines distribution system are modelled by an independent engineering consultant to ensure there is no overloading of individual lines that might contribute to ignition of fires.

All fires on site are recorded and investigated through the ENGIE Hazelwood Incident Management System (INX). Recommendations from the INX reports are sent to the site management team (MLT) for action.

Mine fire is subject to risk assessment under the *Occupational Health and Safety Regulations 2007* (Vic), Part 5.3. Under these regulations fire has been determined to be a Major Mining Hazard. In accordance with the requirements of these regulations, a detailed risk assessment has been undertaken and a series of control measures established to reduce risks to the extent that is reasonably practicable. These risk assessments and control measures are subject to periodic review in accordance with the requirements of the regulations, and also oversight from the relevant regulator (WorkSafe Victoria).

n) Details of the processes and procedures by which the specified operator will:

i) Monitor the implementation of the bushfire mitigation plan:-

When the Annual Fire Season for the Mine is declared, the Mine Production Manager provides weekly reports to the mine management team on the status of relevant fire preparedness activities under the *Guidelines for Season and Period Specific Fire Preparedness and Mitigation Planning* (Paradigm Document Id No. 36546).

ii) Audit the implementation of the bushfire mitigation plan:-

The site is independently accredited for its Quality Management System. All elements of regulatory compliance are audited by Hazelwood internal auditors, ENGIE's auditors, Independent Auditors and various regulators, including Worksafe and DEDJTR.

iii) Identify any deficiencies in the plan or the plans effectiveness:-

All fire policies and procedures are reviewed annually prior to the commencement of the Annual Fire Season declared for the Mine under the *Guidelines for Season and Period Specific Fire Preparedness and Mitigation Planning* (Paradigm Document Id No. 36546).

In addition business processes ensure the update of policies and procedures based on input from any incident investigations, internal audits, external audits, regulator reviews, etc, by logging and monitoring of action items.

iv) Change the plan and the plans implementation to rectify any deficiencies identified.

As noted in point iii), the business has a process to capture and implement improvements for policies and procedures based on findings, recommendations or employee suggestions.

v) Monitor the effectiveness of inspections carried out under the plan

Contractors employed to perform inspections are regularly checked and audited.

All contractors working on site are subject to routine inspections and audit under our procedure SMS Evaluation of Contractors Procedure (Paradigm Document Id No. 49513).

This procedure requires a Responsible Officer to check the contractor on site and confirm that the all health and safety requirements are being met, that the contractors' personnel are qualified and licensed for the work they are performing, and documented work procedures are being followed to the required standard.

vi) Audit the effectiveness of inspections carried out under the plan:-

The site is independently accredited for its Quality Management System. All elements of regulatory compliance are audited by Hazelwood internal auditors, ENGIE's auditors, Independent Auditors and various regulators, including Worksafe and DEDJTR. This would include both the processes used and documentation created under point (v).

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

ENGIE Hazelwood maintains a close relationship with the local CFA due to the high risk of fire to the business.

Regular meetings and joint exercises are held with the CFA.

In line with the recommendations and affirmations in the Board of Inquiry's October 2014 report into the Hazelwood Mine Fire, a number of additional training, resource sharing and communication initiatives are being implemented between ENGIE Hazelwood and the CFA.

ENGIE Hazelwood's Emergency Response Plans (Paradigm Documents Id No 2895 and 890) detail the relationship between ENGIE Hazelwood, the CFA and other state emergency service organisations.

The Emergency Response Plans detail the requirements for statutory investigations as well as regulatory investigations by other emergency services authorities, and the support to be provided by ENGIE Hazelwood.

In addition, significant fires are also reported to DEDJTR and Worksafe. Should a significant fire impinge upon or be caused by the mine electrical assets, a report would also be provided to ESV under our procedures.

Accessibility of Documents

The current approved version of this document is kept on the business document management system and a copy is accessible at the Head Office during normal business hours.

A copy of the version approved by ESV is placed on Hazelwood's public web site.

6. References

Number	Description
Paradigm Document Id No. 2589	Mine Fire Service Policy and Code of Practice
Paradigm Document Id No. 3136	Local Electrical Instructions
Paradigm Document Id No. 2895	Emergency Response Plan Hazelwood Mine
Paradigm Document Id No. 890	Emergency Response Plan Hazelwood Power Station
Paradigm Document Id No. 36546	Guidelines For Season and Period Specific Fire Preparedness and Mitigation Planning
Paradigm Document Id No. 49513	SMS Evaluation of Contractors Procedure
n/a	Occupational Health and Safety Regulations 2007 (part 5.3)
n/a	Board of Inquiry Report into the Hazelwood Mine Fire (October 2014)

Appendix 1 – Drawing of the Mine as at June 2015.(Note: The electrical infrastructure has not changed in the last 12 months)

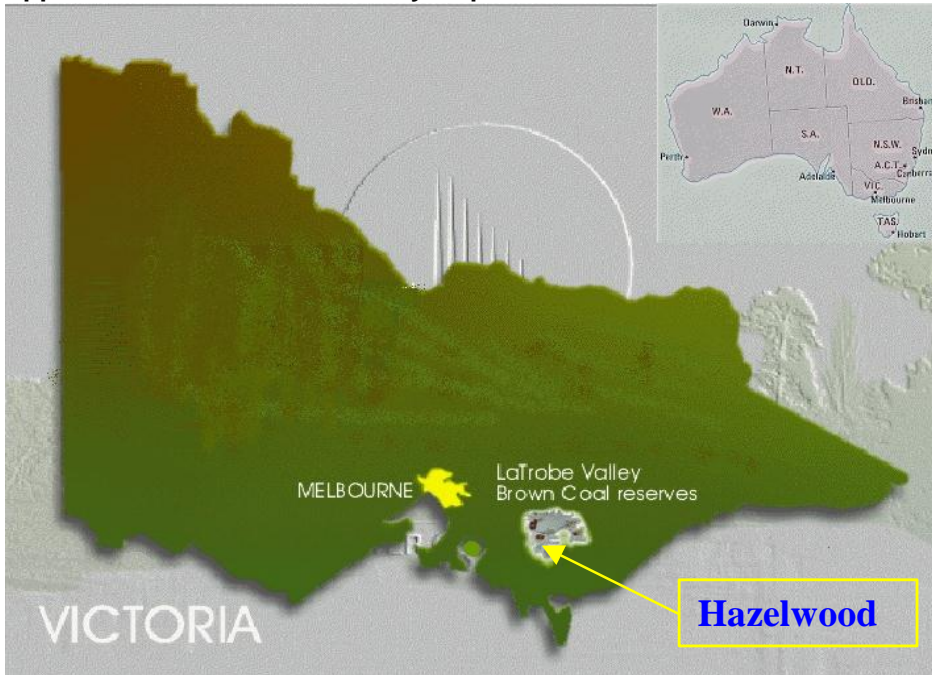
The whole site is in an area assigned a fire hazard rating of "high" by the CFA.

Note: the "at risk" business power lines are shown in black. The other coloured lines on the map indicate overhead lines, on our site, owned by MECs

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Appendix 2 – Hazelwood Locality Map



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