



Emergency Management Guidelines for Wind Farms



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Cover Image: Toora Wind Farm – South Gippsland, Victoria (CFA Region 9).

Introduction

The Emergency Management Guidelines for Wind Farms are designed to provide awareness information for CFA members and wind farm operators relating to emergency management at wind farms. The increasing number of wind farms throughout Victoria has prompted CFA to develop these guidelines. The guidelines aim to reduce the risk and impact of fire in and around wind farms by:

- Providing awareness and information about wind farms and associated fire and incident hazards; and
- Promoting partnerships with wind farm operators;
- Providing recommendations for fire safety measures to be considered.

Application of the guidelines may vary throughout Victoria depending on the associated level of risk and should be implemented with the assistance of local CFA Brigades, Regions or Areas (refer to “What is a Wind Farm” for detail on how a wind farm works).

Risk of Fire Associated With Wind Farms

Wind turbines manufactured today incorporate the highest quality and safety standards. Despite this, CFA recognises that the risk of fire always exists when electronics and flammable oils and hydraulic fluids exist in the same enclosure⁽¹⁾.

The risk of fire can be associated with malfunctioning turbine bearings, inadequate crankcases lubrication, cable damage during rotation, electrical shorting or arcing occurring in transmission and distribution facilities⁽¹⁾.

Wind farms can also be potentially impacted on by wildfire entering the site. This is less of an issue in comparison to normal power generation sites as power transmission is located within the towers and underground to the transformers.

Measures commensurate with the risk need to be considered.

Emergency Management Guidelines for Wind Farms

In accordance with the Electricity Safety Act, wind farm operators must develop a Bushfire Mitigation Plan (BMP) for approval by Energy Safe Victoria. It is recommended that CFA proactively engage with wind farm operators to ensure that CFA fire safety and suppression concerns and incorporated into BMPs.

The following measures should be considered when consulting with wind farm operators in relation to the BMP:

1. Location

- 1.1 It is preferred that wind farms be located on open grassed areas (such as paddocks grazed by cattle and sheep).

2. Access

Adequate access to and within wind farm complexes will assist CFA in responding to and managing fires on site. To enable access for fire appliances the following provisions should be considered:

- 2.1 Constructed roads should be a minimum of four (4) metres in trafficable width with a four metre (4m) vertical clearance for the width of the formed road surface.

- 2.2 Roads should be constructed to a standard so that they are accessible in all weather conditions and capable of accommodating a vehicle of 15 tonnes for the trafficable road width.
- 2.3 The average grade should be no more than 1 in 7 (14.4%) (8.1°) with a maximum of no more than 1 in 5 (20%) (11.3°) for no more than 50 metres.
- 2.4 Dips in the road should have no more than a 1 in 8 (12.5%) (7.1°) entry and exit angle.

3. Water Supply

Appropriate location of water access points will assist safe, effective and timely fire suppression activities. To ensure adequate access to water for CFA, the allocation of static water supplies may be necessary.

Location of water access points should be consistent with the type of risk that exists within a given area. There may be a need for multiple treatments to address the type of risk and community requirements. In the event of a fire, water should be available and accessible to ensure that fire suppression activities are not hindered in any way and to ensure that fire appliances can identify and access water points efficiently.

Multiple tankers need to be filled rapidly and simultaneously to conduct efficient and effective fire suppression.

The following measures should be considered:

- 3.1 Water access points shall be located in safe, easily identifiable areas, accessible in all weather conditions.
- 3.2 Water access points should be designed, constructed and maintained for a load limit of at least 15 tonnes.
- 3.3 A turning circle with a minimum radius of 10 metres is required for fire appliances at all water access points.
- 3.4 Fire brigade appliances should be able to park within four (4) metres of the water supply outlet on a hard standing area.
- 3.5 Bulk static water storages (22,500 Litre) should be provided adjacent to main access tracks for firefighting. Locations should be discussed with CFA Fire Safety Officers in consultation with operational staff.
- 3.6 All tanks shall be manufactured with at least one (and preferably two) 64mm, 3 thread/25mm x 50mm nominal bore British Standard Pipe (BSP) round male coupling 50mm from their base. Outlets should be a minimum of two (2) metres apart.
- 3.7 Water access points are to be marked by appropriate signage (Figure 1) or as per CFA's *Guidelines for Identification of Street Hydrants for Fire Fighting Purposes*.

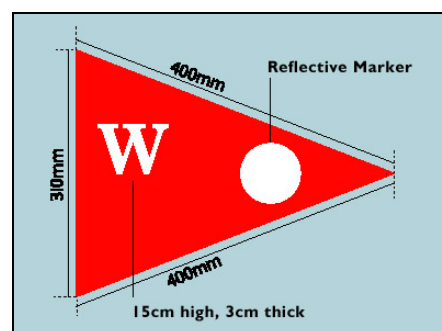


Figure 1. Appropriate Signage for Marking Water Access Points

4. Fuel/Vegetation Management

An important part of BMPs should be fuel/vegetation management. Partnerships between wind farm operators and CFA are also important to ensure that wind farm operators include the appropriate measures within their plans. During the Fire Danger Period (FDP):

- 4.1 Grass should be no more than 100mm in height and leaf litter no more than 10mm deep for a distance of thirty (30) metres around constructed buildings and viewing platforms;
- 4.2 A fuel reduced area of four (4) metres width should be maintained around the perimeter of electricity compounds and sub station type facilities;
- 4.3 There should be no long grass or deep leaf litter in areas where plant and heavy equipment will be working; and
- 4.4 All plant and heavy equipment should carry at least one 9 Litre Water Stored Pressure fire extinguisher with a minimum rating of 3A.

5. Infrastructure

- 5.1 Building Code of Australia and the Australian Standards will determine requirements for any structures on the site and fire protection measures for plant and machinery operating on the site. CFA may have subsequent input into some of these matters if required, possibly upon a referral under Regulation 309 of the Building Regulations 2006, including:
 - 5.1.1 Internal fire protection systems, where appropriate, to assist with fire suppression;
 - 5.1.2 Lightning protection devices installed on each wind turbine;
 - 5.1.3 Electrical and communications cables underground; and
 - 5.1.4 Dedicated monitoring systems within each wind turbine that detect temperature increases in the turbines and shuts them down when the threshold temperature is reached.

6. Consultation

- 6.1 Wind farm operators should include relevant Managers/Officers at CFA Area and Region offices, as well as local CFA brigades, in the consultation process when designing, installing and operating wind farms.
- 6.2 CFA should be proactive and establish partnerships with wind farm operators, particularly if the wind farm's design is not referred to CFA.

CFA's Position on Wind Farms

While CFA has an interest in wind turbines, CFA's interest only extends to implementing appropriate plans and response arrangements for incidents in and around wind turbines, and therefore meeting our statutory responsibility for fire prevention and suppression. CFA's responsibility does not extend to regulating and certifying wind farm building standards, operator's insurance arrangements, or operational restraints on the operator.

While there cannot be any guarantee that an installation involved in electricity generation can never malfunction and cause a fire, the potential for fire of wind turbines is inherently low. A number of steps have been taken by CFA and wind farm operators to minimise the possibility of any wildfire being caused by a wind turbine or as critical infrastructure being affected by wildfire entering the site, including:

- Development of bushfire mitigation plans by Victorian electricity operators for consideration by Energy Safe Victoria – electricity operators should work closely with CFA in the development of bushfire mitigation plans and their fire prevention activities;
- Development of a CFA Standard Operating Procedure for wind turbines – The procedure includes planning for the installation of, and response to incidents in and around, wind turbines;
- Appropriate siting of wind turbines in cleared areas away from tall vegetation – Vegetation surrounding the wind turbine(s) should be managed in accordance with local wildfire management plans; and
- Wind farms operators have rescue equipment to perform rescues if necessary.

Aircraft

Fire suppression aircraft operate under “Visual Flight Rules”. As such, fire suppression aircraft only operate in areas where there is no smoke and during daylight hours. The standard distance of 300 metres between wind turbines would allow aircraft to operate around a wind farm given the appropriate weather and terrain conditions.

Wind turbines, similar to high voltage transmission lines, are part of the landscape and would be considered in the incident action plan.

Conclusion

CFA, through its representation on a range of State and Municipal committees, will monitor prevention, preparedness, response and recovery issues associated with wind farms as part of its holistic risk management processes.



Russell Rees
Director of Operations/Chief Officer

References

1. Australian Wind Energy Association (AusWEA) (2001). Wind Farm Safety in Australia, http://www.auswind.org/WIDP/assets/BP11_Safety.pdf.