



11.04 Working Near Electrical Structures and Conductors SOP

Section 1 - Purpose and Objectives

(1) To provide and enhance the safety of all CFA members when engaged in CFA operational or other activities near electrical structures and conductors.

Section 2 - Scope

(2) This procedure applies to all CFA members operating near electrical structures and conductors.

Section 3 - Procedure

Working Within the Vicinity of Distribution Lines and Transmission Lines

(3) It is important to note the difference between distribution lines and transmission lines, both types of electrical transmitters require unique response tactics as explained below.

(4) A risk assessment should be conducted by CFA members at all times when working in the vicinity of distribution lines and transmission lines. Suitable risk management controls must be considered and enacted.

(5) Transmission Lines transport electricity at extra high voltages between the source of energy (e.g. power station or wind farm) and the substation (where the electricity is transformed for distribution). Transmission Lines typically transport up to 500 Kilovolts (kV) across larger distances and electrical structures.

- a. When conducting operational activities in and around transmission lines and the easements that run underneath them, CFA members must consider the varying dynamic conditions and risks that come with being in the vicinity of high voltage structures. CFA members should conduct a safe person approach dynamic risk assessment (SPADRA) before conducting the activity. The Incident Controller has the discretion to determine the risk and the associated response tactics required.
- b. As part of the initial size-up and ongoing review of the situation, the Incident Controller is encouraged to conduct a dynamic risk assessment to determine if entering onto an easement (within 25 metres of the transmission line) is safe and operationally practicable.
 - i. A CFA vehicle can travel underneath transmission lines when operationally practicable, however, excess caution must be taken to ensure the risk to the crew is minimal.
- c. If in doubt, maintain a 25 metre safe distance from the outer wire of the transmission line or easement. This distance also includes CFA vehicles, elevating work platforms, communications equipment, and light masts.
 - i. In these instances, it is recommended that CFA members do not directly attack fires in transmission line easement areas. On transmission line easements, other methods of firefighting such as indirect attack or parallel attack should be considered.

(6) Distribution Lines carry electricity from the substation to the home via smaller lines and poles. Distribution Lines transport lower voltage electricity of up to 66kV.

- a. While undertaking operational activities no part of CFA vehicles, elevating work platforms, communications equipment, or light masts are to be within 3 metres of any distribution line.

(7) The minimum safe distance from any fallen high voltage distribution line is 8 metres and 25 metres for extra high voltage transmission lines. This distance will increase if the ground is wet or water is present.

(8) When operationally reasonable the Incident Controller may request to isolate distribution or transmission lines when working near, up to, or inside the distances under clauses 5 and 6. This is to be done with the consultation of the relevant power authority/distribution company, with the consideration of any risks or negative side effects of isolating the lines in the process.

(9) When operating elevating work platforms, communications equipment, or light masts outside the outlined distances under clauses 5 and 6, CFA members are exempt from the requirement to have an Energy Safe Victoria registered spotter in place.

(10) During training or assessment activities, no part of any elevating work platform, communications equipment, or light mast is to be placed within 6.4 metres of distribution lines, or 25 metres of transmission lines.

(11) CFA members are not permitted to access or enter any electrical substation including an enclosure/container/kiosk or inside the fenced high voltage substation grounds until:

- a. Approval or accompaniment of the relevant power authority/distribution company.
- b. A SMEACS briefing has been provided to the crews, detailing any no-go zones, and tactics to be used.

Working Within the Vicinity of all Other Power Lines and Electrical Conductors (Including Direct Current Overhead Train Lines and Traction Lines)

(12) During operational activities, drivers/operators of CFA vehicles must not allow any part of elevating work platforms, communications equipment, or light mast to be within 3 meters of any direct current overhead train line or traction line.

(13) When operating an elevating work platforms, communications equipment, or light masts outside the outlined distances in clause 12, CFA members are exempt from the requirement to have an Energy Safe Victoria registered spotter in place.

(14) When working near (up to or inside the distances in clause 12) train lines, Incident Controllers may seek advice from the relevant rail network operator via Firecom and have power isolated if operationally practical. Refer to 10.31 Working in the Rail Corridor SOP.

(15) During training or assessment activities, no part of any elevating work platform, communications equipment, or light mast is to be placed within 6.4 metres of direct current overhead train lines or traction lines.

Electricity Isolation and Fuse Removal

(16) Refer to the Chief Officer's [SOP 9.14 - Low Voltage Fuse Removal](#).

Arcing Through Smoke

(17) Under certain circumstances arcing through smoke can occur from high voltage transmission lines and distribution lines to the ground or other objects (e.g. vehicles driving underneath lines through easements).

(18) An 'arc' or 'flashover' is when electricity – especially at higher voltages – jumps across a gap. The dense smoke and hot gases caused by a fire under or near a high voltage transmission line increases the risk of a flashover. Therefore, remaining a safe distance away (identified in clauses 5 and 6) is essential to reduce the risk of arcing/flashovers in operational activities.

(19) Brigades conducting fuel reduction burns or operational activities should avoid/minimise activity under or near high voltage lines if smoke is likely to contact lines. Contact with the transmission line asset owner should be undertaken before the commencement of any activity of this nature.

Notifications

(20) The Incident Controller can request to have the electricity isolated at the incident scene by notifying via Firecom to the power authority/distribution company responsible for that area. No person should approach or make contact with any fallen electrical conductors or apparatus unless the express permission of the distribution company is granted.

(21) Contact Firecom to obtain specialist advice from the appropriate power authority/distribution company where electrical assets are involved in a fire or incident.

(22) The power authority/distribution company should be notified:

- a. Immediately if it is determined that the electricity supply is required to be isolated in the vicinity of the incident.
- b. By the Incident Controller when there is any damage, or likely to be damage to any conductor, pole, tower, or any other plant and equipment that is the property of the distribution company.
- c. To attend at the discretion of the Incident Controller. Notification must be made via Firecom.

(23) Energy Safe Victoria requires notification under certain circumstances, refer to Chief Officer's [SOP 14.07 – Notifications – Energy Safe Victoria and Municipal Building Surveyor](#).

Extinguishing Media and Method

(24) At all times treat electrical equipment, wires, cables, or conductors as being live unless advised otherwise by the distribution company.

(25) The use of dry chemical or carbon dioxide extinguishing agents should be used in the first instance where there is a possibility that the object is live. Consideration should be given to the ability of the medium to reach the fire.

(26) In the event that the actions in clause 25 are not effective:

- a. Maintain a minimum safe distance as outlined in clauses 5, 6 and 12.
- b. Select an appropriate branch/nozzle, which will be able to direct water the required distance.
- c. Position the water stream and branch operator away from the direct angle of the conductor, this should be at a 90-degree angle from the line of the conductor.
- d. Ensure that the water stream is broken, to prevent the flow of electricity back to the branch operator or between wires.
- e. The water stream should be directed above the fire, this will allow the water droplets to fall onto the objective.

The use of Safety Officers

(27) During any operational activities involving electrical hazards, a Safety Officer should be appointed where appropriate.

a. To appoint a Safety Officer refer to the SOP 11.07 Role and Responsibilities - Safety Officer/Field Safety Officer.

(28) A Safety Officer should be appointed to safeguard an area where an electricity conductor or live object has fallen or is likely to fall, and become a hazard to CFA members, other agency personnel, members of the public, and CFA operations.

(29) The Safety Officer should ensure that all people maintain a safe distance as specified under clauses 5, 6 and 12.

(30) In the event that there are people already in contact with power lines or live equipment:

- a. Keep the casualty calm and, if possible, maintain their current position.
- b. Conduct a risk assessment in consultation with the power company.
- c. Follow the procedure in [14.06 – Notification of Injuries and Fatalities SOP](#).

Safety Note

(31) Maintain the provided safe firefighting distance away from electrical conductors and associated structures.

(32) Any live or suspected live electrical conductors or objects should not to be touched under any circumstances.

(33) All electrical cables and/or live objects are to be treated as live, until demonstrated otherwise by a distribution company representative.

(34) Illuminate the working area in periods of reduced visibility.

(35) All CFA members should remain mindful that all metallic and moisture-holding substances have the ability to become live and conduct electricity. Therefore, be aware of water runoff coming in contact with live objects.

(36) If possible, isolate all flammable liquids and gases from arcing electrical objects.

(37) Appropriate Personal Protective Clothing (PPC) and Protective Equipment (PE) should be worn at all times by CFA members.

(38) Only competent and endorsed CFA members should use technical rescue equipment.

Environmental Note

(39) Electrical transformers contain hazardous and flammable substances. Attempts should be made to prevent this substance from entering waterways. If there is concern over flammable substances entering waterways the Environmental Protection Authority should be notified.

(40) Individual transmission/distribution network providers have a responsibility to manage vegetation around electrical structures and lines.

Section 4 - Definitions

Commonly defined terms are located in the CFA [centralised glossary](#). Document-specific definitions are listed below.

Spotter: The person who observed and warns of the approach of the plant and/or load to overhead power lines or other electrical apparatus.

Arc/flashover: An 'arc' or 'flashover' is when electricity – especially at higher voltages – jumps across a gap. The dense smoke and hot gases caused by a fire under or near a high voltage transmission line increases the risk of a flashover. A flashover may occur between conductors or from conductors to the ground. You may see a flash or hear an

explosion or loud cracking sound.

Direct Current Overhead Train Line: Overhead conductors are generally supported by steel towers that usually operate at 1,500 volts.

Section 5 - Related Documents

[Energy Safe Victoria Report on Electricity Transmission Lines – Bushfire Management and Community Safety 2023](#)

[Firefighting and Transmission Lines October 2023](#)

Please note that additional updated diagrams will be released with the final publication of the SOP.

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Status and Details

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Approval Authority	
Approval Date	To Be Advised
Expiry Date	Not Applicable
Accountable Officer	Jason Heffernan Chief Officer
Responsible Officer	Garry Cook Deputy Chief Officer Operational Response & Coordination
Author	Emma Pollard
Enquiries Contact	Safety Compliance

Glossary Terms and Definitions

"CFA member" - Refers to all CFA volunteers, volunteer auxiliary workers, officers, employees and secondees.

"CFA vehicle" - All vehicles owned or operated by CFA or any Group or Brigade. This includes FRV vehicles being driven by an FRV Secondee.

"Incident Controller" - The individual designated by the control agency to have overall management of the incident and who is responsible for all incident activities.

"Operational activities" - CFA approved, coordinated or pre-planned action, or series of actions, in response to and in support of a potential or existing emergency incident, including training and exercises.

"Dynamic Risk Assessment" - The continuous assessment and control of risk in the rapidly changing circumstances of an operational incident. DRA is an intuitive thought process and is typically not recorded.

"Firecom" - The callsign for day to day / normal radio communications to CFA vehicles and aircraft.

"Personal Protective Clothing (PPC)" - Includes clothing used to provide protection to CFA members from the risks associated with performing a specific operational task for which they are competent and endorsed

"Protective Equipment (PE)" - An object that is utilised during the execution of CFA operational activities and training, which includes breathing apparatus, gas suits, gas monitoring equipment, oxygen resuscitation equipment, safety harnesses and all technical rescue equipment.

"Safety Officer" - An advisor to the Incident Controller on all aspects of potential and current safety and risk management issues present at the incident.

"Live" - An electrically charged area or object.

"Transmission Line" - Overhead conductors generally supported by steel towers that may operate at 66,000 to 500,000 volts.

"Distribution Line" - Overhead conductors supported by wooden or concrete poles and some steel towers that may operate at High Voltage (1,000Volts to 66,000Volts) including Single Wire Earth Return (SWER) lines (12,700Volts) and

Low Voltage (240 Volts to 415 Volts).

"**Conductor**" - An path through which electricity can flow, for example copper or aluminum.

"**Easement**" - A corridor or portion of land that surrounds/runs underneath transmission lines that allows access for maintenance and repair purposes as well as for safety control measures.

"**Kilovolts (kV)**" - A unit of measurement for electric potential or voltage. 1kV is equivalent to 1000 volts.

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