10.30 Response at Solar Facilities SOP

Section 1 - Purpose and Objectives

(1) To provide CFA members with advice about how to safely assess and suppress fires within solar facilities (also known as large-scale solar farms or photo voltaic solar farms).

Section 2 - Scope

(2) This procedure applies to all CFA members.

Section 3 - Procedure

(3) In addition to this procedure, relevant site contact information and pre-incident plans should be considered.

Prior to Site Entry

(4) The Incident Controller should contact the emergency contact representative either directly or via Firecom prior to entering the facility, and ensure arriving crews are effectively briefed on-site hazards.

(5) If contact is not made via Firecom, conduct a 'sitrep' advising that contact has been made to management, including the name and emergency contact phone number.

(6) Ensure the State Duty Officer / District Duty Officer is notified via Firecom for all fires/incidents within a solar facility, or likely to impact a solar facility.

Response to all Fires/Incidents

(7) Each solar facility differs in size, layout, and number of assets. This will impact the tactics used to respond to an incident and the potential safety implications to CFA members.

(8) Vehicles and appliances other than CFA, FRV, FFMV, and network service providers must not enter the site without the site operator's expressed approval.

(9) Establish an Incident Emergency Management Team (IEMT) at the control point (typically at the control room or main gate), consisting of a minimum of:

a. Incident Controller.
b. Safety Officer and/or
c. Site Management Representative.

(10) A Safety Officer should be appointed. To appoint a Safety Officer, follow the procedure in the Chief Officer's SOP 11.07 Role and Responsibilities – Safety Officer/Field Safety Officer.

(11) All CFA vehicles are to be assembled at the staging area until assigned specific tasks and provided with a briefing,

including site-specific safety requirements (including no-go zones, map communications, traffic plans, etc).

(12) Private vehicles of CFA members are not permitted within the solar facility, other than the main entry carpark to facilitate crew changeover.

(13) A traffic management plan should be communicated in accordance with the site's pre-incident plan, to ensure there is no two-way traffic unless:

a. The road or track is more than 6 metres wide.
b. Or, there are passing bays suitable for heavy vehicles with sufficient hard-standing area for passing.

(14) CFA vehicles are to operate only on formed roads and paths within a solar facility.

(15) At all times treat electrical equipment, such as transformers, inverters, wires/cables, and panels as being live unless advised otherwise by the site management representative.

> Note: The use of foams directly on solar infrastructure can damage the electrical equipment.

Fires Involving Grass (Including Impacting Infrastructure)

(16) Considerations must be made to the risks of responding to an incident at a solar facility, the safety of CFA members and emergency personnel should be the main priority.

(17) Where operationally practicable and safe to do so, members can implement tactics to limit damage to the solar facility infrastructure not already impacted by fire through the implementation of RECEO (Rescue, Exposures, Containment, Extinguish, Overhaul).

(18) The following steps should be considered in order when responding to a grass fire at a solar facility:

a. Where infrastructure has already been impacted, utilise indirect attack and exposure protection to protect unimpacted assets, including:
    i. Setting up containment lines around unaffected panel sections away from fire-impacted panels.
    ii. This includes the use of foam or water along unimpacted roads, tracks, clearings/firebreaks, panel rows, and sections to protect the unimpacted infrastructure.
b. If the risk of the fire is too great to fight the fire within the boundary of the solar facility, CFA members and crews can suppress the fire directly via external roadways or tracks outside the boundary of the solar facility to prevent the fire from escaping the area. This is to be done at the discretion of the Incident Controller.

> Note: Water should not be used directly onto impacted panel infrastructure as electrical safety cannot be guaranteed. Solar panels and associated direct current (DC) infrastructure cannot be isolated and will remain live.

(19) In situations where there is a grass fire that is not impacting electrical infrastructure, utilise normal grass fire tactics.

(20) Operating between solar panel rows should be avoided until:

a. Facility management or an appropriate representative is on-site or in direct constant contact (via phone), and the electrocution hazard or other hazards have been eliminated.
b. The Incident Controller in consultation has confirmed that the electrical hazard and other hazards have been

eliminated and a briefing has been undertaken.

> Note: Avoid the path of the smoke, during these incidents solar panels contain exotic materials and smoke carries toxic gasses and potential arcing of electrical currents.

Fires Involving High Voltage Equipment & Structures

(21) CFA members are not permitted to access or enter any high voltage substation including an enclosure/container/kiosk or inside the fenced high voltage substation grounds until the steps in clauses 20a and b are undertaken.

a. For high voltage equipment and structures, a 25 metre safe distance must be maintained to avoid electrical arcing/flashovers and arc flashes.

> Note: CFA members should be aware of the potential for an arc flash to occur from high voltage equipment (e.g. inverters) which can result in an explosion.

(22) Firefighting strategies are to be limited to exposure protection and containment of a fire until the electrical hazard has been eliminated by the operators of the site.

Fires Involving Mobile Plant, Machinery, Vehicles or Buildings

(23) Fires involving plant/machinery/vehicles or buildings which do not impact or involve an electrical installation may (if safe to do so) be assessed by firefighters to commence suppression following consideration of clauses 4-15.

Use of Firefighting Aircraft

(24) Consideration to the use of aircraft may be used for the extinguishment in and around solar facilities. The pilot in command or air attack supervisor shall determine the best suppression strategy in accordance with interagency policies and procedures.

Fire Investigation

(25) Fires involving an electrical installation/equipment or land within a solar facility should be investigated by a Fire Investigator.

a. Energy Safe Victoria (ESV) should be notified of all electrical-related fires within solar facilities via Firecom.

Safety Notes

(26) All conductive components (including insulated wiring and metal frames/structures etc) of electrical installations at solar facilities within the fire area are to be considered ‘energised’ (live) until tested by onsite management and confirmed otherwise. CFA members should not conduct any testing of electrical structures or equipment.

(27) Incident Controllers should consider the use of CFA Warning Alterative Energy tape on high-traffic areas (e.g. entrance and exit points, fences, signs etc).

(28) CFA members must maintain an 8 metre safe distance from low voltage equipment. For high voltage structures, CFA members must maintain a safe distance of 25 metres.

(29) At a minimum, bushfire Personal Protective Clothing (PPC) and Protective Equipment (PE) are to be worn when on the fireground.

(30) Specific hazards include, but not limited to:

a. Water and water runoff coming in contact with live objects.
b. Toxic gasses from combustion. Breathing Apparatus must be worn where firefighting work is required within or near smoke.
c. Electrocution from contact with conductive parts.
d. All electrical cables and/or live objects are to be treated as live until tested to determine otherwise.
e. All metallic and moisture-holding substances have the ability to become live and conduct electricity.

(31) Electrical detectors found within CFA's Low Voltage Fuse Removal kits are not suitable for detecting direct current found within most solar installations.

a. When required, the Incident Controller can liaise with the onsite management representative and request that they test for the detection of an electrical current.

Environmental Notes

(32) When operationally practicable, water runoff may need to be contained and prevented from entering waterways.

Section 4 - Definitions

Commonly defined terms are located in the CFA centralised glossary.

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.

Section 5 - Related Documents

Standing Order 9.00 Fires and Incidents - Management of

ENA Doc 008-2006 – National Guidelines on Electrical Safety for Emergency Service Personnel

Independent Solar Facility's Emergency Plans

Status and Details

Status	Not Yet Approved
Effective Date	To Be Advised
Review Date	To Be Advised
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	Structural Planning

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.

"Fire Investigator" - A person who has received specialised training in Fire Investigation and is competent in determining the origin, cause and path of fires, and endorsed by the Chief Officer.

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

"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.

"Breathing Apparatus" - Within CFA, the acronyms CABA and BA are used interchangeably when referring to compressed air breathing apparatus sets and procedures. The term BA (for breathing apparatus) is more commonly used. BA is also referred to as self-contained breathing apparatus (SCBA). BA is used to provide breathable air for respiratory protection in an immediately dangerous to life and health (IDLH) atmosphere; environments that contain a combination of high temperatures, oxygen deficiency, toxic substances, smoke concentration, dust, heat radiation and/or burning embers.

"Staging area" - A location designated and used during an emergency for the assembly of control and support agency resources prior to deployment.

"Incident Emergency Management Team (IEMT)" - The IEMT supports the Incident Controller and focuses on managing the effects and consequences of the emergency. The EMT Chair (usually the Incident Controller) will task support agency or functional commanders to implement a strategy or to provide resources in support of these strategies through the EMT. Support agency commanders then implement the allocated strategy through their respective command structures, and report back to the EMT Chair as to the success or otherwise of the strategy.

"Solar Facility" - Also known as large-scale solar (LSS) can generate anywhere from hundreds of kilowatts to thousands of megawatts of solar power.