

Solar panels and associated equipment present several unexpected hazards which must be managed to help reduce risk.

This includes the use of roof mounted solar photovoltaic (PV) systems, which present hazards to fire fighters and other emergency responders when a fire event occurs. This is because a PV system introduces a secondary source of electricity supply which should be isolated before fire fighting commences.

A grid connected solar PV system generates electricity via the PV array and feeds it into the main electricity grid and property via an inverter. Inverters are manufactured in a range of sizes, shapes and colours and could be situated anywhere within a building or property. There is currently no requirement to specify the position of the inverter on a property.



Another system which is being installed is a PV system with lithium-ion battery storage units (Solar Integration System, SIS units) which are known as Virtual Power Plants (VPP's). The electricity generated from the PV

array is stored in the SIS units, however once the batteries are fully charged, any unused power that is generated by the PV panels can be diverted back into the grid. There are also standalone solar PV systems not connected to the grid which are installed to provide electricity to a property at night and during blackouts.

Risks and Hazards for Firefighters and Emergency Responders

Firefighters who attend a fire at a site with solar PV systems are at risk of electric shock even if the mains power supply is isolated. This is because the PV system will be still generating electricity from exposure to sunshine, streetlights or even the lights used by emergency response vehicles. The connection line between the solar PV panels and the inverter will also still be live. When there is damage through a fire or storm, building elements such as roof sheeting, gutters and downpipes can also become energised. SIS units also contain electrical equipment and there is a risk of electrocution if the unit is not de-energised.

Firefighters who are present at a property that has been involved in a fire, or been damaged by a storm, may have difficulty locating and isolating secondary power supplies. Even after locating the power supply any warning labels may be very hard to see and read. In addition the batteries within the VPP's, if exposed to temperatures above 70 degrees, can discharge vaporised or decomposed and combustible electrolyte fumes which can ignite causing a fire or possibly an explosion.

Preventative Actions

- ▼ When installing a solar PV system the property owner should:
 1. Clearly identify the dual power supply by identification stickers at the meter, fuse box, inverter and all points of entry.
 2. Provide safe roof level access for firefighters to use in an emergency.
 3. Clearly identify PV isolation points.
- ▼ Following a property loss event such as a fire or flood, the property owner or tenant should treat all electrical systems as potentially energised. As such the property owner or tenant should not attempt to operate any switches as residual moisture could cause the switch, inverter and wiring to be live.
- ▼ At any stage, if at all concerned about existing installations, the property owner or tenant should engage a suitably qualified electrician to inspect and provide advice on the safety of the solar PV system.

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