

Solar Panel and Firefighter Safety

San Jose (CA) FF. A FF who teaches classes on FF Safety related to PV (photovoltaic) systems, who has a degree in Solar Technology, and is also a member of the California State Fire Marshals PV Task Force. While we heard from many in the manufacturing community about this issue, we were very glad to hear from Fire Engineer Matt Paiss of the San Jose FD who wanted to offer some "firefighter" clarity to this discussion. It is an area we all need to be aware of, but as is often the case; a few misconceptions can create miscommunication.

We will turn this over to Matt so he can provide his training and knowledge to address the issues one by one so you can develop your own FD SOP:

1. Panels are only energized in daylight. Overcast days too, but NEVER at night. Scene lights will NOT energize the panels.
2. If the panels, or the roof are on fire, you will not get shocked by spraying water on them. Put the fire out.
3. The voltages of panels are anywhere from 24-48 volts each and generate from 125 to 200 watts in optimal conditions.

These panels are "strung" together in series to increase the voltages to 120 vdc to 400 vdc. While 600 vdc is possible, it is pushing the UL ratings of the enclosures, etc.. The current of these strings is usually from 5-9 amps. And that is only when there is a load (or put more simply, the inverter is sending the power back into the grid). If the inverter is off, there is no current only voltage, i.e. open circuit.

4. The inverters that change the power from DC to AC, are powered by AC. If you shut off the main service breakers, the inverter is OFF and there is NO AC power being sent into the structure. There are capacitors in the inverters that can hold a charge for about 5 min, but in the daytime the panels are producing power anyway. When the sun goes down....everything is de-energized.

FIREFIGHTER WARNING:

There is ALWAYS energized DC power in the conduit from the panels to the inverter IN THE DAYTIME. So, secure all utilities (per SOP's) and stay away from the panels and the conduit in the daytime. That is the danger.

5. Do not break a panel with your axe or related forcible entry tools. Each panel in the string could be carrying the FULL VOLTAGE of that string (120-400 VDC), not just one panel, so if you put a tool through it, you will very likely be getting the rest of the shift off....so don't do it....there is no need to do it, vent somewhere else, and kill the utilities at the main panel based upon your SOP's.

6. There are often junction boxes on the roofs (residential systems). If they do have fuses (not all do), and you pull a fuse while under load, you will very likely cause a fire. Not to mention the time it will take to open the box and do this. Bad idea-leave it alone.

7. In California, we will not let a house burn because it has PV Panels on the roof. I may not be able to put my hole in the best place, but I will put one in where I can when required.

Thanks Matt.