



## The Extra Hazards Fire Fighters Can Face When Dealing With Rooftop Solar Panel Arrays

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Because the risk of a solar module fire is extremely low such occurrences tend to make rather sensational headlines in the media. Arguably the largest was the destruction of 200 square metres of solar installation in Burstadt, Germany, in 2009. What is thought to be the first UK solar PV fire took place in Kent in 2011 when a roof mounted system caught fire, apparently caused by a faulty DC switch. However, much more likely is that a PV system catches light from a fire from beneath the roof it is mounted on.

Whatever the origin of the fire the presence of a solar PV installation, particularly in a domestic situation, creates a set of extra hazards for those having to deal with it. Many of the risks will still present at the salvage stage after the fire has been extinguished.

### **Electric Shock**

Even 100 volts can be lethal to a body. A solar PV array can produce many times that. So the first step should always be to disconnect the inverter from the grid to remove the load from the PV array. However, in daylight the panels will continue to produce a DC voltage. Fire fighters need to take precautions, always treating the whole system as 'energised'. There is the added hazard of electrocution from loose wires damaged by the fire.

### **Failure of the Structural Integrity of the System**

Solar panels put a significant extra load onto the roof structure. If that structure weakens, the risk of roof collapse is increased. In high temperatures the panels may buckle and break free from their mountings.

### **Explosion**

In extreme temperatures panels might explode. This would create the extra hazards of flying glass and toxic vapours.

### **Slipping and Falling**

PV panels can take up a significant proportion of a roof. As the surfaces are smooth and potentially slippery, access to some parts of the roof may well be limited. This could also increase the risk of falling, particularly if there is a lot of smoke around the roof area.

## Potential for Fire Spread

Some experts are trying to establish whether the construction of PV panels makes it easier for a fire to spread along the length of an array thus putting adjacent structures at risk.

Clearly, as solar PV take up continues to grow, it is becoming increasingly likely that fire fighters will encounter a fire in the environs of a solar PV system. It is imperative that fire crews are made aware of these hazards through their training programmes. After the fire in Kent it was reported that the fire crews who dealt with it worked to educate other teams across the UK. That was commendable. In the United States, where the number of PV installations is considerable, there seems to be much more effort to identify and understand all the risks involved. In 2010 The Fire Protection Research Foundation produced a comprehensive report\* on fire safety for solar panel systems which aims to inform the training principles of fire fighting and to encourage further research and revisions to codes and standards within the solar industry. In the foreword it states: 'The safety of fire fighters... depends on understanding and properly handling these hazards through adequate training and preparation.' Few could argue with that.

*\*Fire Fighter Safety and Emergency Response for Solar Power Systems - Final Report, The Fire Protection Research Foundation, May 2010.*

<http://www.nfpa.org/assets/files/pdf/research/fftacticssolarpower.pdf>