

SAFETY IS A HOT ISSUE IN PV

What is an Arc Fault?

An arc fault is a fault in the high voltage wiring of a PV system that can cause a high-energy discharge that can potentially trigger a fire in the presence of combustible material. Arc faults pose fire and electrocution risks during installation, operation and maintenance of PV systems.

Risk Factors

The primary source of dangerous arc faults in a PV system is the presence of high-voltage DC.

In a typical string inverter-based solar energy system, high-voltage DC is distributed and has the potential to trigger a high intensity arc in the presence of a fault. In addition, these risks increase with normal wear and tear of the system.

Improving safety in solar systems depends on eliminating high-voltage DC.

Types of Arc Faults

Series	Occurs when a connection is pulled apart while the PV is producing current. Any intermittent connection in the DC circuit has the potential for producing a DC arc fault.
Parallel	Occurs when the insulation between two conductors of opposite polarity in the same DC circuit becomes ineffective.
Ground	Requires the failure of one insulation system. While GFDI (Ground Fault Detector & Interrupter) provides some measure of protection against this fault, there have been cases of faults to ground that failed to trip the GFDI protection yet created an arc.



2011 NEC: ARC FAULT PROTECTION REQUIRED

690.11 Arc-Fault Circuit Protection (Direct Current) Photovoltaic systems with dc source circuits, dc output circuits, or both, on or penetrating a building operating at a PV system maximum system voltage of 80 volts or greater, shall be protected by a listed (dc) arc-fault circuit interrupter, PV type, or other system components listed to provide equivalent protection.

What People Are Saying:

“As both a solar installer and firefighter, fire safety around PV systems is of particular interest to me. The changes to the National Electric Code to address DC arc faults are an important step for those of us who deal with fires regularly.”

–Edmund J Haemmerle,

Firefighter IAFF 3786, NJ Renewable Energy LLC

The Microinverter Solution

Microinverters eliminate the need for high-voltage DC and are already compliant to the 2011 NEC code. Microinverters distribute AC voltage and are installed in protected branch circuits.

Enphase Microinverters are utility-interactive which means that first responders can de-energize the system by simply shutting the breaker or removing the main meter.