

## First responder utility safety bulletin

Summer 2021



### Incident response tactics for solar photovoltaic systems

*Under normal conditions, solar photovoltaic (PV) systems are safe to operate. As these systems become more prevalent and sophisticated, firefighters and other first responders need to understand these systems to ensure operational safety and situational awareness. Use the tips below to help equip your team to respond to incidents involving PV systems.*



#### Potential PV hazards

Incidents involving PV systems create electrical, structural and chemical hazards that increase the danger and complexity of fire service operations:

- As with any electrical system, contact with a PV system can cause **electrical shock**, serious burns and even death.
- Firefighting operations are complicated by the **structural hazards** caused by the additional weight of a PV array on a weakening roof structure and the inability to ventilate through PV panels or tiles on the roof.
- PV battery storage systems present **chemical and prolonged fire hazards**. Thermal runaway – when batteries overheat to the point of compromise – can generate extremely toxic and explosive gasses. Such batteries retain stored energy and can reignite hours or even days after the initial event.

#### PV operational considerations

- A PV array is capable of generating electricity even when damaged, during inclement weather, and at night when illuminated by scene lighting, lightning or an active flame front.
- A foam blanket or light-duty salvage cover will not produce sufficient opaque coverage to stop the generation of electricity by a PV array.
- An array can shuttle thermal energy back toward the seat of the fire, causing fire growth to accelerate. Be alert for a fire in proximity to an array to progress unexpectedly, and in some cases, cause rapid structural failure.
- Most voltage detection devices used by fire service agencies can only detect alternating current (AC) and will not detect the direct current (DC) present in PV components. You will need to rely on National Grid to detect DC.

#### Critical operational tactics

- As you initiate response, always confirm that National Grid has been notified and is responding.
- Upon arrival, conduct a 360-degree size-up to evaluate the structure from all angles and determine whether there is a PV system on the property.
- If a PV system is in place, locate and identify all PV components – including PV panels, switchgear, inverters, meters, junction boxes and wiring. Does the system include battery storage? Does the system have a single control point or multiple shutoffs?
- Communicate the presence of a PV system on the incident site to your team and update them regularly about the status of the system.
- Even if the PV system is not affected by the incident initially, consider what should be done if the event escalates.
- **Always assume PV arrays and system components are energized.** Work with National Grid to isolate all PV components and shut down the system.
- Utilize the National Incident Management System (NIMS) Incident Command System (ICS) to coordinate tactical action.
- Utilize the DOT Emergency Response Guide for evacuation and shelter-in-place guidance.



#### Fighting a PV fire

During incidents involving PV systems:

- Use **ONLY** tested opaque salvage tarps when attempting to stop the PV array's generation of electricity.
- Always wear full protective clothing (PPE) and self-contained breathing apparatus (SCBA). Burning storage batteries may release highly toxic and explosive gases.
- Position crews at the corners of the structure or beyond the collapse zone (a distance 1.5 times the height of the involved structure) whenever possible. Ensure those operating on the roof or inside the structure have a clear escape route away from PV components.
- Never walk on or break PV panels or roof tiles. Never attempt to open, touch or cut any PV components or wiring. You could be shocked and seriously injured.
- Consider horizontal ventilation as an alternative to roof-top operations.
- Never utilize a straight stream or foam. Contain small fires with Class C extinguishing agents. Control larger fires by applying water in a 30-degree fog pattern at 100 psi, from a distance of at least 30 feet from the energized source.
- Always keep yourself and all tools and equipment **at least** three feet away from PV components.
- Conduct thorough decontamination after any exposure to the products of combustion generated by PV components.

**Keep yourself, your team and the public safe this summer. Visit [firstresponder.ngridsafety.com](https://firstresponder.ngridsafety.com) today to register and complete your utility safety training.**

To report emergencies, call 911 and National Grid immediately.



Know what's below. 811 before you dig.

In case of gas emergencies:

Long Island and the Rockaways:  
911 and 1-800-490-0045  
Metro New York:  
911 and 1-718-643-4050  
Upstate New York:  
911 and 1-800-892-2345  
Massachusetts:  
911 and 1-800-233-5325  
Rhode Island:  
911 and 1-800-640-1595

In case of electric emergencies:

Upstate New York:  
911 and 1-800-867-5222  
Massachusetts:  
911 and 1-800-465-1212  
Rhode Island:  
911 and 1-800-465-1212

**IMPORTANT TERMS AND CONDITIONS – PLEASE READ PRIOR TO USE.**