

First Responder Beware[®]

Electrical Safety for First Responders

Staying safe while saving others

Click on each slide to advance.

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- Firefighters, police and EMTs are typically first on the scene in an emergency and face the greatest risk from electrical infrastructure contacts.
- Understanding the potential dangers and dealing with them correctly makes everyone safer.
- This program is designed to supplement, not replace, your department's standard operating procedures (SOPs).



Electrical safety basics

- Respect the power of electricity
- Hands off electrical systems
- Protect yourself and others from shock
- Always observe the 10-foot rule
- Be aware of overhead power lines
- Always assume PV systems are energized
- Use extra caution near downed power lines
- Manage substation and transformer fires



Respect the power of electricity

- **Electricity always seeks the easiest, most direct path to the ground through conductors like:**
 - Your body
 - Trees
 - Water
 - Metal objects and structures
 - Long or tall equipment
- **Even low-voltage electric shock can be fatal.**
- **Standard-issue protective gear DOES NOT insulate you against electric shock.**
- **Electric shock and burn injuries may include internal tissue damage that is not immediately apparent. Make sure victims receive thorough medical attention.**



Hands off electrical systems

Never attempt to disconnect electrical services:

- **Never cut service wires.**
- **Never attempt to remove electric meters.**
This is extremely dangerous and can cause serious injury or death.
- **Never attempt to open or enter a manhole or vault** until you are sure it has been de-energized.
- **Never touch or attempt to move power lines.**



Protect yourself and others from shock

- **Always identify power lines and electrical equipment upon arrival at an incident scene.**
- **Assume all lines are energized**, as well as all objects in contact with power lines.
- **If power lines or electrical equipment are involved in an incident**, have your dispatcher contact National Grid.
- **Provide the best possible directions** to the location.
- **Secure the area.**



Always observe the 10-foot rule

- ALWAYS keep yourself and your equipment **at least 10 feet away** from overhead power lines.
- Higher voltages require greater clearance distances.
- There is no uniform system for identifying power line voltage. When in doubt, contact National Grid for clearance information.
- *Electrical safety distances given are minimums. Always use the maximum possible distance.*



Be aware of overhead power lines

- Park emergency vehicles as far away as possible from overhead power lines.
- Keep aerial equipment **at least 10 feet** away from overhead lines. Assign a spotter to help judge the distance.
- **Never use a solid water stream to fight fires near overhead power lines.**
- **Never try to retrieve a drone** that has crashed into power lines or other electrical facilities.



Be aware of overhead power lines

If your equipment contacts a power line, the equipment should be considered energized, as should the power line.

- **Remain on the equipment.** Move the equipment away from the line if you can do so safely.
- **Warn others** to stay far away.
- Have someone **call National Grid** immediately.
- **Stay put** until utility personnel give the all clear.



Be aware of overhead power lines

If imminent danger forces you off the equipment:

- **Jump clear**, landing far enough away from the equipment that you don't touch the equipment and the ground at the same time.
- **Land with your feet together and shuffle away with small steps**, keeping your feet together and on the ground.
- **Do not run or take large steps.** When equipment contacts a line, electricity spreads out in the ground like ripples in a pond and the voltage decreases with distance from the point of contact. If your legs bridge two areas of different voltage, you could be killed.



Always assume PV systems are energized

Be aware of PV systems. Always assume PV systems are energized.

- **In incidents involving PV systems,** be alert for electrical, structural and chemical hazards:
 - **Consider all PV equipment,** junction boxes and wiring to be energized. Do not touch or cut into PV modules, conduit or equipment.
 - **Prepare for fires** near a rooftop array to grow unexpectedly, in some cases causing rapid structural failure.
 - **Always wear full protective clothing and SCBA.** Batteries that ignite or overheat may release hazardous materials and highly toxic and explosive gases.



Use extra caution near downed power lines

- Park emergency vehicles away from fallen lines.
- Secure the area:
 - Keep yourself and the public **at least 30 feet away** from fallen power lines.
- Transmission lines from large towers require a distance of **100 feet**.
- Never touch or attempt to move fallen lines or objects contacting them.
- Never use a solid water stream to fight fires near downed lines.



Use extra caution near downed power lines

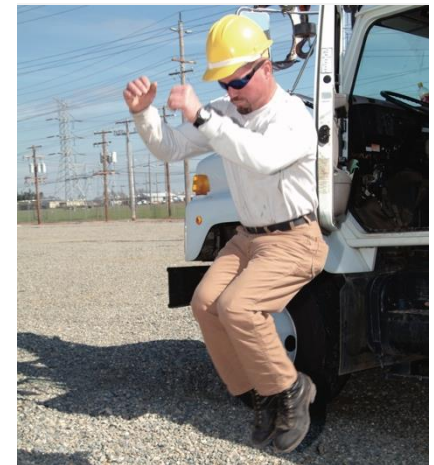
- **DO NOT** enter, touch or even approach areas or vehicles that may be energized.
- Call National Grid.
- Instruct vehicle occupants to drive the vehicle away from the line if this can be done safely.
- If the vehicle cannot be moved, instruct the occupants to stay put until utility personnel give the all clear. Staying in the vehicle is their **BEST** protection against electrical shock.



Use extra caution near downed power lines

If occupants in an energized vehicle are in imminent danger from fire or other hazards:

- Instruct them to **jump clear**, landing far enough away from the equipment that they don't touch the equipment and the ground at the same time.
- Tell them to **land with their feet together and shuffle away with small steps**, keeping their feet together and on the ground.
- **Demonstrate the proper procedure** from a distance.
- **If occupants are injured, disabled or otherwise unable to safely exit the vehicle on their own**, your incident commander will assess the situation and tell you how to proceed.



Substation and BESS emergencies

- **Burning electrical equipment is already ruined and will be replaced.** The safest course of action is to **LET IT BURN.**
- Contact National Grid and wait for their personnel to arrive. **Never attempt to enter a substation or battery energy storage system (BESS) without utility personnel present.**
- **Isolate the area at least 300 feet in all directions.** Keep unauthorized persons away from a burning substation or a compromised BESS.
- Be alert for **transformer oil explosions and toxic smoke hazards.** Stay upwind. A BESS can present an explosion hazard, even without signs of fire.
- **Protect area exposures** to prevent fire from spreading. Do not direct water into the substation.
- **Prevent contamination of water resources.** Monitor for oil runoff and direct it away from catch basins, surface waters and wetlands.
- **If an equipment fire must be suppressed,** utility personnel and the incident commander will tell you how to proceed.



Transformer fires

- **Do not open or enter switch cabinets or pad-mounted transformers.**
- **Never cut locks or pry cabinets open.**
 - Equipment contains live electrical components, and if you contact them, you could be killed.
- **Call National Grid, evacuate the public and protect area exposures.**
- **Let transformers burn until otherwise instructed by utility personnel.**



- **Identify all overhead power lines and electrical equipment upon arrival at an incident scene.**
- Whenever you suspect electrical infrastructure is involved, or when in doubt, **call National Grid.**
- **Never attempt to cut service wires or remove electric meters.**
- **Never touch power lines.**
- **Always assume PV systems are energized.**
- **Assume electrical equipment is energized and keep yourself and your equipment *at least 10 feet away.***
- **Do not fly drones near power lines** or other electrical equipment.
- **Even low-voltage electric shock can be fatal**, and your gear does not insulate you against electric shock.
- **When responding to a substation or BESS emergency or a transformer fire**, let it burn, evacuate the area and protect exposures.

Thank you for your attention.

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