

HAZARD ALERT

CPWR

THE CENTER FOR CONSTRUCTION
RESEARCH AND TRAINING

BATTERY SAFETY



What Are The Dangers?

Only trained and qualified personnel should test, install, or maintain battery systems.

Explosion or Fire

Batteries and battery systems can become high-energy explosion or fire hazards, especially if short circuits, thermal runaway, or internal faults occur. Lack of spacing and inadequate ventilation can contribute to ignition. Lithium-ion batteries are particularly susceptible to overheating, catching fire, or exploding—especially if damaged, defective, or used improperly.

Chemical Hazards

Batteries can pose chemical hazards, especially if damaged or improperly handled. Lithium-ion batteries may release flammable vapors, while lead-acid batteries can leak sulfuric acid and emit hydrogen during charging.

Electric Shock

Batteries exceeding 100 volts DC (direct current) pose serious shock risks. Maintaining sufficient space between terminals and segmenting the system into $\leq 100V$ sections can reduce the likelihood of electric shock.

Thermal Burns

When a short circuit causes tools or conductive objects to overheat, anyone who comes in contact with them can get burned. When handling batteries with short-circuit power above 1kW, workers should wear PPE, especially during assembly, voltage testing, or when terminals are exposed.

Arc Flash

DC arc flash hazards occur when a gap forms across conductors, producing intense heat and pressure. Correct conductor spacing can reduce the risk of arc flash significantly.

Do not put water on a battery fire.

You can cover it with a fire blanket, but you first need training on use of fire blankets. Be sure to wear full PPE when uncovering it.

Do you work with battery-powered systems, tools, equipment, or technology?

If so, you are at risk for battery-related injuries. Working on or near battery systems—like those used in uninterruptible power supply (UPS) units or solar installations—can expose you to serious hazards, as can using battery-powered tools and equipment.

Several types of batteries are common on jobsites. Most common are **lithium-ion batteries**, which are used in power tools, and **lead-acid batteries**, which are found in larger equipment, like forklifts and scissor lifts. Every type has its own risks. Inspect batteries regularly to detect early warning signs and isolate suspect batteries.

To Prevent Injuries...

1 Treat All Battery Terminals & Conductors as Live Unless Otherwise Verified

Unlike electrical systems, which can be locked out, batteries cannot be fully de-energized—especially when used in energy storage systems (ESS) that capture and hold energy for later use. Even if batteries are “dead” or no longer being used, be careful. Do not put batteries in the trash! Talk to your employer and/or manufacturer about how to dispose of batteries safely.



The Reid Gardner Battery Energy Storage System in Nevada.

2 Use, Store, & Charge Batteries as Intended

- ▶ Purchase batteries listed by a qualified testing laboratory and be sure they are designed for the device.
- ▶ Always follow manufacturer's instructions, including placing batteries in the device correctly.
- ▶ Use ONLY the charging cord that came with the battery or device and do not keep charging it once fully charged.
- ▶ Store batteries away from water and anything flammable, avoid high heat, and keep them at room temperature if possible. Use fireproof containers for lithium-ion battery storage.

3 Use Insulated Tools, PPE, & Protective Clothing To protect against shock, burns, and arc flash,

use insulated tools and remove any jewelry or other metal from your body. Make sure your employer provides, and you wear, the right PPE, such as voltage rated gloves. **Stop using a battery if you notice: odor, leaking, a change in color or shape, too much heat, or unusual noises. Use battery recycling containers for storing and transporting damaged batteries.**

Do not use batteries of any type if they have been exposed to water or damaged in any way.

If you think you are in danger:

Contact your supervisor.
Contact your union.

Call OSHA
1-800-321-OSHA

Find out more about construction hazards.

To receive copies of this Hazard Alert and cards on other topics

call 301-578-8500
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