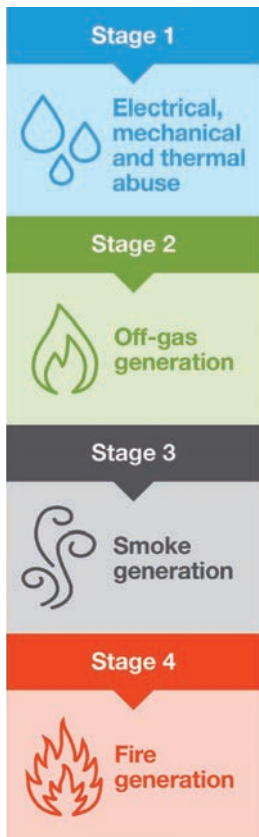


Response tactics for battery energy storage incidents



Lithium-ion (Li-ion) batteries are the leading technology for residential and commercial battery storage. Use the tips below to learn how to prevent ignition of compromised Li-ion batteries and respond to battery fires.

The stages of battery failure

Li-ion batteries may fail when they are damaged or subjected to intense heat. Learning to recognize the four main stages of battery failure will help you identify opportunities to safely initiate offensive tactics and prevent incident escalation.

Stages 1 and 2: De-escalation tactics

- Electrically isolate the system and work with National Grid personnel to verify grid disconnect.
- Cool compromised battery cells with water.
- Monitor off-gassing. The off-gassing phase is considered the best time to act. If possible, use positive pressure ventilation from a shielded position to reduce gas accumulation.
- Consider where the gas is venting and may accumulate. Evacuate accordingly.
- Consider the potential for ignition and explosion and establish defensive operations as the incident progresses from off-gassing (Stage 2) to smoke generation (Stage 3).
- Remember that conventional gas detection such as multi-gas meters cannot provide sufficient warning of the transition to smoke generation.

Stages 3 and 4: Operational safety and containment

When off-gassing gives way to smoke generation, you are at the tipping point. You must transition to a containment strategy and defensive operations. Prepare for a long-term incident with high-volume toxic and explosive gas production, persistent shock hazards, the potential for re-ignition hours or even days after initial extinguishing, and the need for a sustained high-volume water supply. Pursue slow and methodical containment actions.

Fighting a battery fire

- **Confirm with your dispatcher that National Grid has been notified** and is responding.
- **Always wear full protective clothing** and self-contained breathing apparatus (SCBA).
- Work with National Grid to isolate all components and shut down the system.
- **Remain at least 30 feet away from the battery** when extinguishing the fire. Contain small fires with Class C extinguishing agents. Where Class C agents are impractical or when the fire is large, apply water in a 30-degree fog pattern at 100 psi. Avoid water discharges into storm drains or water bodies (wetlands, streams, etc.)
- **Conduct thorough decontamination** after any exposure to the products of combustion or electrolytes generated by Li-ion batteries.
- **Prepare for deflagration:** rapid burning that may create a significant pressure wave, similar to an explosion. Take a defensive position at the corners of the structure.
- **Seek advice from the BESS manufacturer** via a technical assistance phone number or manual.
- **Use the Emergency Response Guidebook (ERG)** Guide 111, *MixedLoad/Unidentified Cargo*, and Guide 147, *Lithium-Ion Batteries* for evacuation and shelter-in-place guidance.

For more safety information and training, visit firstresponder.ngridsafety.com.
To report emergencies, call 911 and National Grid immediately.