

BATTERY ENERGY STORAGE SYSTEM SAFETY – STANDARDS AND PRACTICES

Large Customers



This compilation of **Battery Energy Storage System (BESS) safety practices** is applicable for customers that either have or are considering the installation of higher quantities of energy storage (greater than 250 kWh).

The [National Fire Protection Association \(NFPA\) website](#) provides useful documentation and videos on BESS standards for design and installation, as well as BESS safety research.

- The NFPA offers free on-line training and comprehensive instructor-led BESS and Solar classroom training featuring videos, animations, activities and case studies

For systems that are not installed but being considered:

- **Ensure the vendor/contractor follows applicable codes and standards including:**
 - *Designing* per UL 1642, 1973, 1741 SA, 9540
 - *Testing* per UL 9540A
 - *Permitting* per California Fire Code (CFC) Section 1206
 - *Installing* per NEC Article 706
 - *Interconnecting* per SCE's interconnection guidelines – see [SCE Grid Interconnections website](#)
- **Ensure that the BESS is maintained according to equipment manufacturer (OEM) guidelines, ANSI/NETA-MTS, NFPA 70B, and NFPA 855**

Please note that your local Authority Having Jurisdiction (AHJ) may have additional requirements or special interpretations of these standards.

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For existing systems installed pre-2019:

- Ensure that the BESS is maintained according to the equipment manufacturer (OEM) guidelines, ANSI/NETA-MTS, NFPA 70B, and NFPA 855
- Employ a qualified fire protection engineer/consultant to perform a hazard mitigation analysis (e.g.,: Failure Modes and Effects Analysis (FMEA), or Bowtie) per CFC Section 1206 or NFPA 855
- Consider retrofitting with appropriate safety features
 - *Control system/battery management system (BMS)*
 - Ground fault detection
 - Cell/module voltage/current/temperature monitoring
 - *Gas monitoring*
 - Off-gas/cell venting detection and early shut down
 - Toxic and flammable gas detection
 - *Ventilation*
 - Deflagration venting for a potential catastrophic event
 - Intrinsically safe ventilation
 - *Fire detection*
 - Flame, smoke and/or heat (dependent on the system layout, location and other design features)
 - *Fire suppression*
 - Fire hydrants
 - Automatic Sprinklers
 - *24/7 central alarm monitoring*
 - *Fire department-targeted signage per CFC Section 1206 or NFPA 855*
- Perform planning in coordination with local fire departments
 - Pre-incident planning, awareness, familiarization
 - Emergency response plans, including post-incident reporting



BATTERY ENERGY STORAGE SYSTEM SAFETY

- Review your fire and evacuation plans annually with personnel within the occupied building
- In the event the system catches fire (you may notice bulging, hissing, smoking, or flames)
 - Immediately notify the fire department and request a hazmat team
 - Consider evacuation radius and protection of surrounding structures that could catch fire or cause severe damage
 - If safe to do so, open the electrical disconnect to isolate the system from the building
 - Potential off-gassing may be toxic and flammable depending on the type of system
 - There may be electrolyte leakage requiring containment
 - Do not attempt to disassemble or remove the energy storage system yourself; there could be energy remaining in the system that could pose an electric shock or fire hazard, even after the system is disconnected
 - The system could reignite after the initial fire is extinguished

This material has been prepared for informational purposes only. You should consult your own engineering, construction or legal advisors before installing any BESS, EV charging system, or solar power system. SCE makes no recommendations or representations regarding the quality or performance of any manufacturers, dealers, contractors, installers or materials.

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