POLICY RESOURCE

Battery Energy Storage System Safety

Battery Energy Storage Systems (BESS) are among the most thoroughly tested and code-governed energy infrastructure deployed, and **their safety record is improving dramatically** as the technology matures.

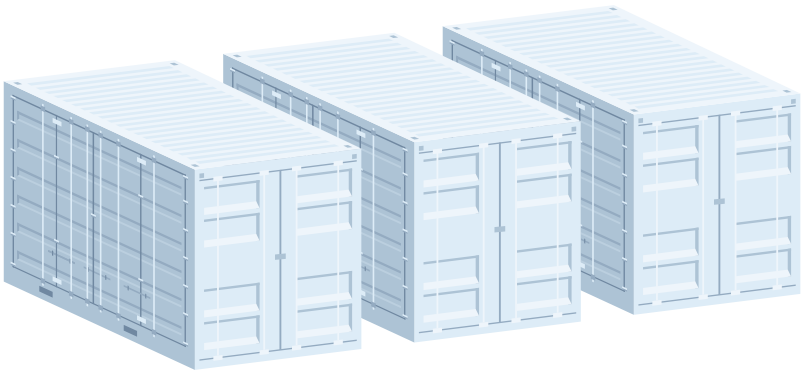
BESS Adhere to a Rigorous Safety Framework

Every BESS installed in the United States must meet a layered stack of consensus-based, nationally recognized design, construction, and testing requirements for product safety, installation, and performance:

UL 9540: System Safety Certification	Mandatory system-level certification covering electrical, mechanical, thermal, and fire safety across the entire system. Required for legal installation in the U.S. and Canada.
UL 9540A: Large-Scale Fire Propagation	The national standard for large-scale fire testing. Simulates failure conditions at the cell, module, unit, and installation level. Results directly shape installation requirements and fire protection design.
NFPA 855: Standard for the Installation of Stationary Energy Storage Systems	Developed by firefighters, fire protection engineers, and testing laboratories, and the battery industry. Covers fire detection and suppression, explosion control, gas detection, ventilation, and thermal runaway protection. Enforced through NFPA 1 Fire Code and the International Fire Code. The 2026 Edition is published, with the 2023 Edition already in widespread adoption.

The Safety Record at a Glance

Most incidents that have occurred involved early-generation systems built before modern standards existed. Facilities designed and built to current codes **perform markedly better.** In 2025, the instances of fire to GWh deployed reached an all-time low, falling from over 1 in 2018 to just 0.03.



98%

Decline in BESS failure rate, 2018–2024 (EPRI, 2024)

25,000%+

Growth in U.S. battery storage deployment over the same period

Zero

Documented cases of air, soil, or water contamination requiring remediation across 35 major U.S. BESS fires, 2012–2024 (Fire & Risk Alliance for ACP, 2025)

Fire Department Perspectives are Integral

NFPA 855 requires facility owners to coordinate directly with the local Authority Having Jurisdiction (AHJ) before a facility goes live, notify emergency responders of all training dates and locations, and keep emergency operations plans on-site and accessible to first responders at all times. Policymakers can help ensure this existing framework is consistently adopted and enforced.

Reactive Legislation is Counterproductive

Restricting BESS development risks halting the deployment of technology governed by rigorous, continuously updated national standards—in response to incidents that, in most cases, involved older systems that predate those standards. At the same time, this jeopardizes a local community's ability to achieve energy affordability, grid resilience and reliability goals.

POLICY RECOMMENDATIONS

What Good Policy Looks Like

- Adopting and enforcing the 2026 edition of **NFPA 855**
- Requiring **Hazard Mitigation Analyses** for all new facilities
- Supporting **AHJ coordination** with facility owners during pre-permit planning
- **Training public safety agencies** in BESS thermal event response best practices

Michigan, Indiana, and New York have enacted NFPA 855-based requirements. California's State Fire Marshal independently adopted the standard in March 2025.

This is the model: consistent, enforceable, evidence-based standards applied uniformly.

SEIA and its members are **committed partners** in advancing responsible deployment of this critical technology.

Key sources: EPRI BESS Failure Incident Database (2024); Fire & Risk Alliance, Assessment of Potential Impacts of Fires at BESS Facilities (2025); NFPA 855 (2023 ed.); UL 9540/9540A; ACP Battery Storage Blueprint for Safety (March 2025). Full citations available on request.