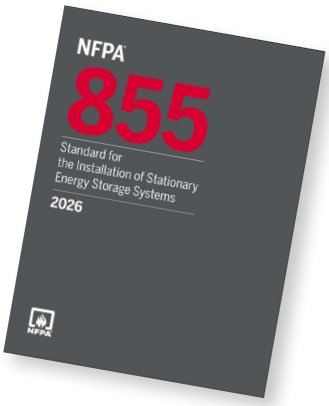
Energy Storage

Emergency Preparedness for Battery Energy Storage Systems

Emergency Planning and NFPA 855

The 2026 edition of the National Fire Protection Association (NFPA) 855's *Standard for the Installation of Stationary Energy Storage Systems* (ESS) includes new requirements for emergency planning and training. Two site-specific documents are detailed:

- Emergency operations plan (EOP)
- Emergency response plan (ERP)



The EOP, covered in previous editions of NFPA 855, includes roles and responsibilities for facility staff as well as procedures such as safely shutting down the system, removing a damaged ESS, accounting for persons on site, and general emergency procedures. The ERP, newly required for 2026, is an overarching document addressing preparedness, mitigation, response, and recovery. The ERP applies to both facility staff and first responders. ACP has published an ERP template[1] that can be customized for individual facilities and a model ERP in Annex G of NFPA 855 (2026). Both the EOP and ERP are to be updated as necessary and reviewed at least annually by the project developer or responsible party.

Pre-Incident Planning

Planning for emergencies is covered by NFPA 1620, *Standard for Pre-Incident Planning*, which in 2024 was rolled into NFPA 1660, *Standard for Emergency, Continuity, and Crisis Management: Preparedness, Response, and Recovery*, along with two related NFPA standards. Content specific to NFPA 1620 is in Chapters 17 through 23 and Annex Y. The planning process, including training and plan maintenance, is overseen by the authority having jurisdiction (AHJ).

The hazard mitigation analysis (HMA) addresses hazards inherent to the ESS in question and adds site-specific context based on local conditions and the site layout, including firefighter access points and critical safety systems like emergency shutoffs. These plans should be developed in close coordination with the local fire department. Additional information on the HMA is available in ACP's *Hazard Mitigation in Battery Energy Storage Systems*.[2]

Analysis from the results of fire and explosion testing to UL 9540A, including the large-scale fire test (LSFT) provides key information for emergency planning. The purpose of the LSFT is to verify that in the worst-case scenario of fire event in a completely involved enclosure, heat from that fire will not cause thermal runaway in adjacent enclosures. LSFT results must be analyzed by a registered design professional using anticipated wind conditions at the facility. The LSFT, along with other site-specific safety studies including the HMA, is used to create Minimum Approach Distances for First Responders in the proper PPE.

Remote monitoring of BESS facilities can be an important tool for pre-incident awareness, providing vital information for first responders during an event. Firefighters, in coordination with project experts, can use this information, along with data from the LSFT, to inform incident response, determine the dominant hazard (i.e., electrical, deflagration, or fire) and decide whether additional defensive measures are warranted.

1 https://cleanpower.org/resources/energy-storage-emergency-response-template/

2 Hazard Mitigation for Battery Energy Storage Systems Fact Sheet

Training

Training on the procedures included in the EOP and ERP is essential for personnel responsible for installing the ESS, personnel involved in ongoing ESS operation, maintenance and repair, and first responders. Installation personnel and emergency responders should be trained before the first ESS units arrive onsite. Additionally, emergency responders and those supporting plant operations should be trained once the ESS is ready for operations and requisite safety systems are functioning. Training should include a clear escalation and contact tree for the project, including identifications of relevant subject matter experts to the fire service.

Facility staff are required to be trained in both the EOP and ERP, with annual refresher training. ERP training is required for first responders, and they should attend recurring sessions. Tabletop exercises and site walkdowns can be useful to promote teamwork, improve preparedness, and identify potential gaps in the plans. Records of all training should be retained.

Photo credit: Plus Power

Post-Incident Recovery

When Incident Command determines that conditions have stabilized, post-incident recovery plans in the ERP can be set in motion. The facility decommissioning plan should include procedures for removing equipment that has been damaged by fire or another event. This removal is not the responsibility of the fire department.

Modules containing cells in which the casings are breached must be managed as regulated waste as defined in 40 CFR Part 261 and the following parts governing generators, transporters, and treatment facilities. This will apply to most modules involved in a fire.

Modules that are damaged but contain cells with intact casings can be managed as universal waste under 40 CFR Part 273. These modules can be packaged appropriately and shipped by common carrier to a licensed collection point or treatment and disposal facility. Additional requirements apply if the total weight exceeds 5,000 kilograms.

Battery enclosures not involved in a fire should be inspected for potential damage. If firefighters used defensive measures to keep adjacent enclosures cool, those units should be inspected for possible water intrusion. If available, battery management system records should be reviewed to determine maximum battery temperatures reached during the event and whether cells or modules could have been compromised as a result based on OEM guidelines. Batteries removed from service should be safely discharged to the grid or a resistor bank (if approved by the decommissioning plan) to manage stranded energy risk.

In most cases, battery enclosures involved in a fire can be cleaned, repaired, tested, and returned to service following cleanup and removal of the equipment.