

# Technical requirements for fire prevention of new energy batteries

What are battery-related fire codes and standards?

For several decades, governing bodies such as the International Fire Code (IFC), National Fire Protection Association (NFPA), and Underwriters Laboratory (UL) have released battery-related fire codes and standards to ensure and improve public health and safety by establishing minimum standards for fire prevention and protection.

What is battery energy storage fire prevention & mitigation?

In 2019, EPRI began the Battery Energy Storage Fire Prevention and Mitigation - Phase I research project, convened a group of experts, and conducted a series of energy storage site surveys and industry workshops to identify critical research and development (R&D) needs regarding battery safety.

Do li-ion batteries need fire protection?

Marine class rules: Key design aspects for the fire protection of Li-ion battery spaces. In general, fire detection (smoke/heat) is required, and battery manufacturer requirements are referred to in some of the rules. Of-gas detection is specifically required in most rules.

Does NFPA 13 cover fire protection for lithium-ion batteries?

Since NFPA 13 does not cover fire protection for lithium-ion batteries, the available criteria for fire protection design are limited. At its meeting in December of 2023, the task group discussed the following considerations for fire protection:

What are the NFPA 855 fire-fighting considerations for lithium-ion batteries?

For example, an extract of Annex C Fire-Fighting Considerations (Operations) in NFPA 855 states the following in C.5.1 Lithium-Ion (Li-ion) Batteries: Water is considered the preferred agent for suppressing lithium-ion battery fires.

How many MWh of battery energy were involved in the fires?

In total, more than 180 MWh were involved in the fires. For context, Wood Mackenzie, which conducts power and renewable energy research, estimates 17.9 GWh of cumulative battery energy storage capacity was operating globally in that same period, implying that nearly 1 out of every 100 MWh had failed in this way.<sup>1</sup>

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The stationary Battery Energy Storage System (BESS) market is expected to experience rapid growth. This trend is driven primarily by the need to decarbonize the economy and create more decentralized and resilient "smart" power grids. fire safety technology to help prevent thermal runaway in BESSs. The guide analyzes the far-reaching

As lithium-ion (Li-Ion) batteries become ubiquitous in devices ranging from smartphones to electric vehicles (EVs), their high energy density poses new fire safety challenges, including the risk of thermal runaway which ...

The model fire codes outline essential safety requirements for both safeguarding Battery Energy Storage Systems (BESS) and ensuring the protection of individuals. It is strongly advised to ...

Lithium-ion batteries in energy storage systems have distinct safety concerns that may present a serious fire hazard unless operators understand and address the risk proactively with holistic, advanced fire detection and prevention methods.

The guideline is specifically designed to provide practical guidance for the installation of batteries in both commercial and residential buildings, as well as in free-standing outdoor structures. It also covers the latest fire protection requirements for large-scale batteries in containers, increasingly common in large solar and wind farms.

Battery Storage Fire Safety Roadmap: EPRI's Immediate, Near, and Medium-Term Research Priorities to Minimize Fire Risks for Energy Storage Owners and Operators Around the World . At the sites analyzed, system size ranges from 1-8 MWh, and both nickel manganese cobalt (NMC) and lithium iron phosphate (LFP) chemistries are represented. All ...

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