

Date of Hearing: April 7, 2025

ASSEMBLY COMMITTEE ON EMERGENCY MANAGEMENT

Rhodesia Ransom, Chair

AB 841 (Patel) – As Amended March 24, 2025

SUBJECT: State Fire Marshal: personal protective equipment: battery fires

SUMMARY: Requires the State Fire Marshal to develop, in consultation with the Division of Occupational Safety and Health, a working group to make recommendations regarding personal protective equipment used in responding to lithium-ion battery fires, as specified. Specifically, **this bill:**

- 1) Requires the State Fire Marshal to develop, in consultation with the Division of Occupational Safety and Health, a working group to make recommendations regarding personal protective equipment used in responding to lithium-ion battery fires.
- 2) Requires the working group to include members of the State Board of Fire Services, academia, and health and safety experts, as determined by the State Fire Marshal.
- 3) Requires the working group to review, and for the purpose of making recommendations shall consider, at a minimum, all of the following:
 - (a) The latest personal protective equipment to limit exposure to lithium and other heavy metals when responding to fires where lithium-ion batteries are present;
 - (b) Technology to clean personal protective equipment after responding to a lithium-ion battery fire;
 - (c) Whether different types of personal protective equipment should be used for different types of lithium-ion battery fires, including large scale battery energy storage facilities, home-based battery energy storage facilities, and electric vehicles that have lithium-ion batteries; and
 - (d) Current decontamination practices at the fire scene to reduce exposures and potential negative health consequences.
- 4) Requires the working group recommendations be delivered to the Legislature no later than September 1, 2026.
- 5) Sunsets the requirement for submitting a report to the Legislature on January 1, 2030.
- 6) Makes legislative findings and declarations related to the prevalence of cancer among firefighters, fires involving lithium-ion batteries in California, and the complexity and intensity of lithium-ion battery fires.

EXISTING LAW:

- 1) Establishes the State Fire Marshal (SFM), within the Department of Forestry and Fire Protection (Cal FIRE), to foster, promote and develop ways and means of protecting life and property against fire and panic. (Health and Safety Code Sections 13100-13100.1)

- 2) Grants the CPUC with regulatory authority over public utilities, including electrical corporations. (Public Utilities Code Section 701)
- 3) Authorizes the CPUC, after a hearing, to require every public utility to construct, maintain, and operate its line, plant, system, equipment, apparatus, tracks, and premises in a manner so as to promote and safeguard the health and safety of its employees, passengers, customers, and the public. (Public Utilities Code Section 768)
- 4) Requires the CPUC, as part of the Public Utilities Act, to implement and enforce standards for the maintenance and operation of facilities for the generation and storage of electricity owned by an electrical corporation or located in the state to ensure their reliable operation. (Public Utilities Code Section 761.3)
- 5) Requires an application to the California Energy Commission for the operation of an energy facility to include, amongst other things, safety & reliability information about the facility for emergency operations. (Public Resources Code 25520)
- 6) Requires the California Energy Commission (CEC) to undertake various actions to support the state's clean energy and pollution reduction goals, including implementing the Long-Duration Energy Storage Program by providing financial incentives for projects to deploy innovative energy storage systems to the electrical grid for purposes of providing critical capacity and grid services. (Public Resources Code Section 25640)
- 7) Authorizes the California Occupational Safety and Health Standards (Cal/OSHA) Board within the Department of Industrial Relations (DIR) to establish by an affirmative vote of at least four members (from a total of seven), to adopt, amend or repeal occupational safety and health standards and orders. Requires Cal/OSHA to adopt standards that are as effective as the federal standards, as specified. Also establishes that Cal/OSHA is the only agency in the state authorized to adopt occupational safety and health standards. (Labor Code Section 142.3)
- 8) Requires every employer to furnish employment and a place of employment that is safe and healthful for the employees, including requiring an injury prevention plan. (Labor Code Section 6401)

FISCAL EFFECT: Unknown. This bill has not been analyzed by a fiscal committee.

COMMENTS:

Purpose of the bill: According the author, “Our state has made great strides toward utilizing electricity and batteries over fossil fuels. As such, lithium-ion battery storage systems have proliferated and California has the most amount of utility-scale battery storage facilities and electric cars, second only to China. While positive in many ways, this battery expansion has also come with unintended consequences, as the recent fire in Moss Landing—among others—demonstrated. Our firefighters are there to fight the fire to the best of their ability and keep our communities safe from further spread. But their current Personal Protective Equipment (PPE) and decontamination procedures have not been updated with this new form of fire that is becoming more common. As a result, they are exposed to toxic metals and semi-volatile organic compounds, exposing them to cancer and other serious health risks. To safeguard firefighters’

health amid the rapid expansion of lithium-ion battery use, California urgently needs updated PPE and more effective decontamination procedures.”

Equity Impact: According to the author’s staff, “Firefighters face many threats of danger while protecting property and lives. It is the state’s duty to mitigate the harms they face, where feasible, and the expansion of dangers present in lithium-ion battery fires that PPEs either cannot sufficiently protect against or have cleaned off is a danger that firefighters should not have to grapple with.”

Background

Firefighting remains one of the Nation’s most hazardous professions: According to the Administrator of the United States Fire Administration, “Fire is a public health and safety problem of great proportions, and firefighting remains one of the Nation’s most hazardous professions. On average there are more than 1.2 million structure fires, nearly 3,000 deaths, thousands of injuries, and scores of individuals displaced annually from fires. Although disasters such as fires can affect everyone, fires can also exacerbate pre-existing challenges in underserved communities across the country. These impacts are further compounded by poor implementation and enforcement of national building codes and fire risks associated with technology that make fires more common, more intense, and more destructive. These challenges pose heightened risks to the public and to first responders who safeguard our communities, and the challenge continues to evolve. For example, emerging technologies like Lithium-ion (Li-ion) powered devices and harmful chemicals including polyfluoroalkyl substances (PFAS) introduce new and continued risks to our communities and firefighters.”

Lithium-ion Batteries: Lithium-ion batteries are comprised of an anode, cathode, separator, electrolyte, and two current collectors (positive and negative). The anode and the cathode store the lithium. The electrolyte carries positively charged lithium ions from the anode to the cathode and vice versa through the separator. The movement of the lithium ions creates free electrons in the anode, which creates a charge at the positive current collector. The electrical current then flows from the current collector through a device being powered (cellphone, computer, etc.) to the negative current collector. The separator blocks the flow of electrons inside the battery.

Compared to other high-quality rechargeable battery technologies (nickel-cadmium, nickel-metal-hydride, or lead-acid), lithium batteries have a number of advantages. They have one of the highest energy densities of any commercial battery technology, approaching 300 watt-hours per kilogram (Wh/kg) compared to roughly 75 Wh/kg for alternative technologies. High energy densities and long lifespans have made lithium-ion batteries the market leader in portable electronic devices and electrified transportation, including electric vehicles and jets.

Risk of Thermal Runaway: One of the primary risks related to lithium-ion batteries is thermal runaway. Thermal runaway is a phenomenon in which the lithium-ion cell enters an uncontrollable, self-heating state. Thermal runaway can result in extremely high temperatures, violent cell venting, smoke, and fire. Faults in a lithium-ion cell can result in a thermal runaway, and these faults can be caused by internal failure or external conditions. Lithium-ion battery fires and explosions are triggered by the thermal runaway reactions inside the cell and, when stored near or next to another battery or batteries, can set off a chain reaction, making an already tough fire to fight even worse. When they reach thermal runaway, lithium-ion battery fires can burn

for hours or even days, until all the flammable chemicals in the battery have been consumed by the combustion reaction.

One such example occurred in Rancho Cordova in June of 2022, when a Tesla Model S, which had been badly damaged in a collision was sitting in a wrecking yard and suddenly erupted in flames. When firefighters arrived the car was engulfed, according to the Sacramento Metropolitan Fire District, “[e]very time the blaze was momentarily extinguished, the car’s battery compartment reignited.” Eventually, the firefighters used a tractor to create a pit in the dirt, were able to get the car inside, and then filled the hole with water. That allowed the firefighters to suffocate the battery pack and ultimately extinguish the fire, which burned hotter than 3,000 degrees and took more than an hour and 4,500 gallons of water to extinguish.

Lithium-ion batteries and PFAS: Lithium-ion batteries are used globally as a key component of clean and sustainable energy infrastructure, and emerging Lithium-ion battery technologies have incorporated a class of per- and polyfluoroalkyl substances (PFAS) known as bis-perfluoroalkyl sulfonimides (bis-FASIs). PFAS are recognized internationally as recalcitrant contaminants, a subset of which are known to be mobile and toxic, but little is known about environmental impacts of bis-FASIs released during Lithium-ion battery manufacture, use, and disposal.

Growth of Battery Storage in California and Projected Need: Over the past several years, the deployment of battery storage systems has grown significantly in California, growing from 500 megawatts (MW) in 2019 to over 13,300 MW statewide in 2024. According to the CPUC, “Battery storage systems are one of the key technologies California relies on to enhance reliability and reduce dependency on polluting fossil fuel plants. Battery storage systems soak up clean energy in the daytime when the sun is shining, store that electricity, and then export it to the grid in the evening hours when the sun is down. In 2024, California made historic progress in clean energy deployment. The state brought more than 7,000 MW online—the largest amount in a single year in California’s history. This includes over 4,000 MW of new battery storage. California’s current installed battery storage capacity is over 20 percent of California’s peak demand. The state’s projected need for battery storage capacity is estimated at 52,000 MW by 2045.”

The Vistra Fire Incident at Moss Landing Power Plant: On January 16, 2025, a fire started at the Vistra Battery Energy Storage Facility and soon engulfed the Phase 1 battery energy storage building on the grounds of the Moss Landing Power Plant. The massive fire and thermal runaway event burned for days, destroyed tens of thousands of lithium-ion batteries, and resulted in shelter-in place and evacuation orders. Prior to the Vistra Fire, there had been three safety incidents at separately owned battery energy storage facilities located at the Moss Landing Power Plant, which occupies one of the largest battery energy storage systems.

SB 1383 (Hueso) and CPUC’s General Order 167: Given California’s growing reliance on lithium-ion battery storage systems and recent safety issues at one of the state’s largest lithium-ion battery storage facilities, SB 1383 (Hueso, Chapter 725, Statutes of 2022) expanded the CPUC Generating Asset Owner (GAO) operation and maintenance standards, contained in General Order (GO) 167-B to oversight of energy storage systems, not just electric generation facilities, including systems owned by third-parties.

On March 15, 2025, the California Public Utilities Commission modified General Order 167, which provides a method to implement and enforce maintenance and operation standards for electric generating facilities, in order to add new safety standards for the maintenance and

operation of battery energy storage systems, as required by SB 1383. The CPUC also made explicit that battery storage facility owners must develop emergency response and emergency action plans, as required by SB 38. In addition, the CPUC made other technical updates to the standards to improve safety, reliability, and effectiveness of operation and maintenance activities, such as establishing technical logbook standards for battery storage systems, and expanding requirements for emergency plans that relate to all electric generating facilities.

Arguments in support: The California Professional Firefighters write, “There has been a recent spate of incidents involving lithium-ion batteries and energy storage systems (ESS). These incidents have been increasing in frequency and severity and have resulted in widespread community impacts, severe toxic exposures, and the injuries of our members as they respond to try and mitigate the damage. It is necessary to take a critical look at the standards surrounding firefighter health and safety issues when responding to these fires. The dangers of lithium-ion battery fires cannot be understated, both to the safety personnel responding to them as well as to the surrounding communities.”

Related legislation: AB 303 (Addis) Prohibit the authorization of a development project that includes a battery energy storage system capable of storing 200 megawatthours or more of energy if the development project is located within 3,200 feet of a sensitive receptor or is located on an environmentally sensitive site, as specified. (Pending in the Assembly Committee on Utilities and Energy)

AB 434 (DeMaio) Prohibits, until January 1, 2028, a public agency from authorizing the construction of a battery energy storage facility, as defined and requires the State Fire Marshal to adopt guidelines and minimum standards for the construction of a battery energy storage facility to prevent fires and protect nearby communities from any fire hazard posed by the facility, as specified. (Pending in the Assembly Committee on Utilities and Energy)

AB 588 (Patel) Requires the State Fire Marshal to convene a lithium battery working group to identify those safety issues associated with lithium batteries and associated charging infrastructure, as specified. (Pending in the Assembly Committee on Emergency Management)

AB 615 (Davies) Requires applications filed with the State Energy Resources Conservation and Development Commission for certification of a site and related facility which includes an electric transmission line or thermal power plant, or both, to contain an emergency response and action plan that incorporates impacts to the surrounding areas, as specified. (Set to be heard in the Assembly Committee on Emergency Management on April 7, 2025)

AB 696 (Ransom) of this Session. Requires the California Environmental Protection Agency to convene a Lithium-Ion Car battery Advisory Group to review and advise the Legislature on policies on handling and disposing of lithium-ion vehicle batteries. (Pending in the Assembly Committee on Appropriations)

AB 1285 (Committee on Emergency Management) Requires the State Fire Marshal, in consultation with the Office of Emergency Services, to develop fire prevention, response, and recovery measures for utility grade lithium-ion battery storage facilities, as specified. (Set to be heard in the Assembly Committee on Emergency Management on April 7, 2025)

SB 283 (Laird) Require the CPUC and the Office of the State Fire Marshal to review and consider the most recently published edition of the National Fire Protection Association (NFPA) 855, Standard for the Installation of Stationary Energy Storage Systems, for incorporation into the next update of the California Building Standards Code adopted after July 1, 2026. (Pending in Senate Energy, Utilities and Communications Committee)

Prior legislation: SB 38 (Laird, Chapter 377, Statutes of 2023) required each battery energy storage facility in the state and subject to regulation by the California Public Utilities Commission to have an emergency response and emergency action plan that covers the premise of the battery energy storage facility.

SB 1383 (Hueso, Chapter 725, Statutes of 2022) expanded the CPUC's safety oversight of electric generating facilities to encompass energy storage facilities.

AB 2514 (Skinner, Chapter 469, Statutes of 2010) required the CPUC to determine appropriate targets for load serving entities to procure energy storage systems.

REGISTERED SUPPORT / OPPOSITION:

Support

California Professional Firefighters

Opposition

None on file.

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