

**OCCUPATIONAL SAFETY  
AND HEALTH STANDARDS BOARD**

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Attachment No. 2

**INITIAL STATEMENT OF REASONS**

## CALIFORNIA CODE OF REGULATIONS

TITLE 8: Sections 5184 and 5185  
of the General Industry Safety Orders

**Storage Battery Systems and Changing and Charging Storage Batteries****SUMMARY**

Title 8, General Industry Safety Orders storage battery regulations have not been updated in over thirty years. Various battery technologies have been developed since then, which are not adequately addressed by current regulations. For example, large-format lead-acid designs are widely used for storage in backup power supplies in cell phone towers, high-availability settings like hospitals, and stand-alone power systems. For these roles, modified versions of the standard lead-acid cell may be used to improve storage times and reduce maintenance requirements. Gel-cells and absorbed glass-mat batteries are common in these roles, collectively known as VRLA (valve-regulated lead-acid) batteries and have proliferated throughout many California workplaces since the early 1980s.

Current regulations address the changing and charging of lead-acid storage batteries and their charging areas. They do not address VRLA batteries (also commonly referred to as maintenance free batteries), lithium ion and other modern battery types, which are designed, constructed, utilized and handled differently than lead-acid batteries. The current proposal will create a new section 5184, Storage Battery Systems, to address stationary battery systems. Additionally, Section 5185, Changing and Charging of Storage Batteries is proposed to be amended to make the section more applicable to newer battery technologies, in addition to traditional lead-acid batteries.

This regulatory proposal is intended to provide worker safety at places of employment in California.

**Section 5184. Hazardous Mixtures. (Repealed)**

This section is not currently used. The proposed amendments will title the section, "Storage Battery Systems" and will apply to stationary storage battery systems used for standby power, emergency power, or uninterrupted power supplies. The section will also add two definitions, which are based upon the definitions found in Chapter 6 of the 2010 California Fire Code (CFC) for a battery system and a stationary storage battery. Battery systems covered under the proposed regulation will be required to contain approved equipment, devices, and/or procedures to preclude, detect, and control failures. Employers will need to ensure that safety caps on

batteries are maintained in proper working order. Storage battery systems covered in this section will also be required to meet the applicable requirements of Section 5185.

The proposed amendments will provide the regulated public with information to safely operate and maintain a storage battery system. The definitions will aid the public in understanding the scope of the regulation.

### **Section 5185. Changing and Charging Storage Batteries.**

Section 5185 currently contains information to protect employees from battery hazards like electrolyte exposure, flammable gases, and battery handling. It addresses training for emergency procedures, protecting charging areas from damage by mobile equipment, and precautions to be taken to prevent open flames, sparks, or electric arcs. It also has requirements for shower and eyewash facilities, and provides guidance on the use of jumper cables and vent caps.

A new subsection (a) is proposed to require that the changing and charging of batteries comply with applicable requirements found in Section 5184 Storage Battery Systems. Referring to Section 5184 will inform the public that there are additional battery safety regulations that may be applicable to their processes.

The current subsection (a) requires that battery charging occur in areas designated for that purpose. It also requires that employees working with storage batteries “be instructed in emergency procedures such as dealing with acid spills.” The current subsection (a) will be redesignated as subsection (b) and is proposed to be modified to say that employees working with storage batteries be qualified employees. Adding the word “qualified” will ensure that employees are sufficiently trained and experienced with the specific type of battery with which they are working. The phrase “such as dealing with accidental acid spills” is proposed for deletion from the subsection because training for emergency procedures should cover all foreseeable emergencies and not just those related to spills. Removing the phrase will help employers consider other emergency situations upon which training may be required, instead of focusing on acid spills alone.

Subsection (b) currently requires that concentrations of flammable gas be kept below 20 percent of the lower explosive limit (LEL) and that harmful concentrations of electrolyte mist be prevented. Subsection (b) is proposed to be redesignated as (c) and to be reworded to state more clearly that batteries capable of venting flammable gas or electrolyte mist must be ventilated to prevent gas concentrations from exceeding 20% of the LEL of the gas, or mist concentrations from reaching harmful levels. Wording will be added to clarify that the ventilation may be by natural or mechanical means. The newly proposed language informs the public that flammable gas and corrosive mist levels, where present, may be controlled by natural or mechanical ventilation. The subsection was reworded because not all batteries emit flammable gas or corrosive mist and therefore do not need ventilation controls.

Subsection (c) currently requires that “where corrosive liquids are regularly or frequently handled in open containers or drawn from reservoirs or pipelines, adequate means shall be provided to neutralize or dispose of spills and overflows promptly and safely.” The subsection is

proposed to be redesignated to (d) and to have the following ambiguous words removed: “regularly,” “frequently,” “promptly,” “safely,” and “adequate.” Instead of only requiring clean-up materials for the listed processes, the proposed change will require that clean-up materials be present wherever the corrosive liquids from batteries are handled or can potentially be released. The changes to the subsection serve to clarify that spill clean-up materials are necessary wherever corrosive liquids are used, regardless of frequency.

Subsection (d) currently requires that a “carboy tilter, siphon, hand-operated bulb or hand-operated pump [be] provided and used for dispensing electrolyte or acid.” Subsection (d) is proposed to be redesignated as (e) and to be rewritten in a clearer form to address devices used for sampling or dispensing electrolyte. Instead of listing specific pieces of equipment to be used, the proposed change will apply to all equipment used to dispense or sample electrolyte and require that such equipment be specifically designed for the task.

To organize the section and group subsections pertaining to electrolyte safety, subsections (i), (m), and (n), are proposed to be redesignated as subsections (f) - (h), respectively, so that they are found closer to proposed subsection (e). The proposed change is editorial in nature and does not affect the intent of the regulation.

Current subsections (e) and (j) are proposed to be combined to form subsection (i) because both current subsections address mobile equipment. The proposed change is editorial in nature and does not affect the intent of the regulation.

Current subsection (f) states that “Appropriate mechanical lifting and material handling devices or equipment shall be provided for handling batteries.” The word “appropriate” is proposed to be removed from subsection (f) because it is vague. The proposed change will make the regulatory text clearer, but does not change the subsection’s intended meaning. The subsection will also be redesignated (j).

Current subsection (g), which prevents smoking in charging areas, will remain unchanged, except that it is proposed to be redesignated as (k).

Subsection (h) requires that precautions be taken to prevent ignition sources in battery charging areas. It also regulates storage racks, tools and other metallic objects, which could be placed on top of battery terminals, and requires that battery chargers be off when connecting or disconnecting leads. The subsection is proposed to be redesignated as (l) and to add “static discharge” and “short circuits” to the list of ignition sources to prevent. Minor rewording of the first sentence is also proposed to inform the public more clearly that the precautions must be taken in areas where batteries are charged, regardless of whether the charging occurs in a designated charging area or not. Adding “static discharge” and “short circuits” to the list of ignition sources will aid the public in more fully preventing injuries from fires and explosions in battery charging areas.

Current subsection (k) requires that vent caps be in place and properly functioning during charging, and that any battery covers be open to allow heat to dissipate. Subsection (k) is proposed to be redesignated to (m) and amended to clarify that only batteries with vent caps need

to have the vent caps in place. The sentence requiring that “care [be] taken to assure that vent caps are functioning” is proposed for deletion because newly proposed Section 5184(e) requires that all safety caps be maintained in proper working order. The proposed change will make the standard easier to understand and aid in compliance.

Current subsection (l) requires that facilities for washing the eyes or body be provided near storage battery areas. The subsection is proposed to be redesignated (n) and amended to state that the shower or eyewash must be utilized in accordance with Section 5162 Emergency Eyewash and Shower Equipment. The added language will refer the public to Section 5162, providing guidance on the necessity, use, and installation of an emergency shower or eyewash. The exception to the redesignated subsection (n) will be amended to clarify that it only applies to (n).

An amendment is proposed to subsection (p) to clarify that the exception therein applies to (p).

A new subsection (q) is proposed to require personal protective equipment (PPE) in accordance with Section 3380 Personal Protective Devices. Adding subsection (q) will alert the public that PPE may be required when working with storage batteries, and direct them to the appropriate section for further information.

The proposed amendments are necessary to provide guidance to the public to safely work with storage batteries and storage battery systems, and to address modern battery technologies.

**TECHNICAL, THEORETICAL AND/OR EMPIRICAL STUDIES, REPORTS OR DOCUMENTS RELIED ON BY THE BOARD**

1. An email from Scott Ratigan, sent on January 12, 2009, with the subject “Proposal for updating Cal/OSHA’s battery standard, 5185”.
2. 2010, California Fire Code, Title 24, Part 9, Chapter 6, Section 608, “Stationary Storage Battery Systems”.
3. Advisory committee minutes from April 16, 2014, members roster and attendance sheets.
4. U.S. Department of Labor, Occupational Safety and Health Administration, 29 CFR 1910.178, Powered industrial trucks.
5. U.S. Department of Labor, Occupational Safety and Health Administration, 29 CFR 1910.268, Telecommunications.

These documents are available for review Monday through Friday from 8:00 a.m. to 4:30 p.m. at the Standards Board Office located at 2520 Venture Oaks Way, Suite 350, Sacramento, California.

**PETITION**

This proposal was not the result of a petition.

### **ADVISORY COMMITTEE**

This proposal was developed with the assistance of an advisory committee. (A list of advisory committee members, attendance sheets, and minutes are included as Documents Relied Upon.)

### **FIRE PREVENTION STATEMENT**

This proposal includes fire prevention or protection standards. Therefore, approval of the State Fire Marshal pursuant to Government Code Section 11359 or Health and Safety Code Section 18930(a)(9) is required.

### **SPECIFIC TECHNOLOGY OR EQUIPMENT**

This proposal will not mandate the use of specific technologies or equipment.

### **ECONOMIC IMPACT ANALYSIS/ASSESSMENT**

The Board has made a determination that this proposal will not result in a significant, statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states. The proposal adopts requirements from the CFC and best practices based upon input from stakeholders at an advisory committee meeting. Battery systems used for emergency and backup power are typically supplied by the manufacturer with the necessary procedures and safeguards in place to detect, control, and prevent failures. As long as employers follow manufacturer instructions for maintaining and operating the equipment, the Board expects that they will be in compliance with the proposed regulation. No business in the state is expected to have to purchase additional equipment to comply with this standard.

Larger companies who operate customized emergency and backup battery systems are likely to have procedures in place equal to or more protective than the requirements of this standard because it is in their interest to protect their capital investment as well as their employees.

The adoption of this proposal will neither (1) create nor eliminate jobs in the State of California nor result in (2) creation of new businesses or the elimination of existing businesses or (3) create or expand businesses in the State of California, because the amendments update Title 8 regulations to reflect requirements taken from the 2010 CFC and best practices, currently observed by a majority of employers.

The proposed regulation will increase worker health and safety protections by clarifying current requirements and codifying best practices identified in a representative advisory committee. The amendments will also benefit employers by reordering some of the requirements so that similar provisions are grouped together. Requirements that only apply to specific battery types and uses have been re-worded to allow the employer to determine if the regulation applies to his or her process. While addressing newer battery technologies, the proposed changes amend current requirements to more accurately reflect battery technologies and best practices currently in use.

Economic assumptions in this report are based upon 2012 Census data<sup>1</sup> which report that there are approximately 865,000 non-farm businesses in California. The Board estimates that about 5% of the non-farm businesses in California rely on battery power other than portable batteries (AAA, AA, C, D, 9-volt, etc.), or about 43,000 businesses.

Most businesses are expected to already have procedures in place that comply with the requirements of this standard in order to avoid the costs of unexpected power loss. Measures which protect equipment and battery systems are also useful in protecting employees from fires and explosions. The Board estimates that fewer than 10% of 43,000 businesses, or less than 4,300 businesses, could be required to seek help from a safety consultant to ensure that they are in compliance with the proposed regulation.

Using the median hourly rate<sup>2</sup> for a safety consultant working in the Pacific (AK, HI, WA, OR, CA) of \$140, a 2-hour consultation to evaluate a facility's battery safety program could cost a business about \$280. The consultant would evaluate the effectiveness of the employer's program to address battery hazards and ensure that the equipment is being maintained according to manufacturer recommendations. Fire, electrical, and general safety of employees, whether related to battery systems or not, are already required by other regulations. The Board expects that only a small minority of California businesses would need to hire a safety consultant specifically for the purpose of complying with the proposed regulation and that the economic impact would be insignificant overall.

This regulatory proposal is intended to provide worker safety at places of employment in California.

### **EVIDENCE SUPPORTING FINDING OF NO SIGNIFICANT STATEWIDE ADVERSE ECONOMIC IMPACT DIRECTLY AFFECTING SMALL BUSINESSES**

The Board has determined that the proposal may affect small businesses. However, no significant economic impact is anticipated. Section 5184 is based on the 2010 California Fire Code (CFC) and updates Title 8 regulatory text with applicable requirements. The proposed text codifies current practices and requirements from the CFC. Additionally, emergency and backup power supply equipment purchased from a manufacturer already has the necessary safeguards present. Following the manufacturer's instructions for use and maintenance of the equipment will not only ensure safety, but also extend the useful life of the product.

The amendments proposed in Section 5185 reword and clarify existing regulations, but do not create additional requirements for small businesses. By clarifying the requirements of 5185, small businesses are likely to be less burdened than what current regulations impose.

### **REASONABLE ALTERNATIVES TO THE PROPOSAL AND THE BOARD'S REASONS FOR REJECTING THOSE ALTERNATIVES**

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<sup>1</sup> 2012 Census Data, <http://quickfacts.census.gov/qfd/states/06000.html>, accessed on September 19, 2014.

<sup>2</sup> IEEE-USA Consultants Fee Survey Report, 2011 Edition. Page 23. Available here: <http://www.gmsystems.com/uploads/3/1/4/3/3143302/consultantfeesurvey2011.pdf>

No reasonable alternatives have been identified by the Board or have otherwise been identified and brought to its attention that would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons than the proposed action, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.