

**OCCUPATIONAL SAFETY
AND HEALTH STANDARDS BOARD**

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MINUTES OF THE ADVISORY COMMITTEE FOR
GENERAL INDUSTRY SAFETY ORDERS, SECTIONS 5184 AND 5185, VALVE REGULATED
LEAD-ACID (VRLA) BATTERIES AND STORAGE BATTERY SYSTEMS

April 16, 2014
Sacramento, CA

1. Call to Order.

The meeting was called to order by the chairman, David Kernazitskas, Senior Safety Engineer, Occupational Safety and Health Standards Board (OSHSB), at 9:05 am on Wednesday, April 16, 2014, in Sacramento. The Chair was assisted by Leslie Matsuoka, Associate Governmental Program Analyst, OSHSB.

2. Opening remarks.

Mr. Kernazitskas went over the handouts and started the introductions of the attendees. He then reviewed the Standards Board policy regarding the use of advisory committees; i.e., the Board has found advisory committees to be an effective way to develop a proposal because of the expertise of the attendees, and provided general information about the rulemaking process.

3. Discussion of the proposed rulemaking:

Background

The Chair explained that the request for the rulemaking came from a January 2009 email from Cal/OSHA Consultation. The author explained that he was encountering more and more frequently, different types of batteries that were not addressed by Title 8, Section 5185. He suggested that the regulation be updated to include newer battery technologies, especially valve-regulated lead-acid batteries.

Discussion on Necessity

The Chair pointed out that Section 5185 "Changing and Charging Storage Batteries" primarily contained information unchanged since the 1970s. Additionally, some employers could have confusion about which parts of the standard apply since not all of Section 5185 is applicable to modern battery technology.

Terry Thedell (SDGE) stated that batteries were not only used for energy storage, but also to supply power as in SDGE's community energy storage cells. Stephen McCluer (Schneider Electric) observed that Section 5185 is primarily focused on charging stations for forklifts and only addresses lead-acid batteries. He also pointed out that most of the use of batteries today is not in charging stations, but instead for uninterrupted power supplies (UPS). Jo Forchione (PG&E) agreed that the battery standard is outdated and in need of updating. The committee determined that an update to the battery standard was necessary.

Rulemaking Language Discussion

Jay Weir (AT&T) said that the exceptions for showers and eyewashes in certain areas were needed in the standard and he was not sure why they had been proposed for deletion. He said that AT&T has several hundred enclosed environmental vaults where a shower or eyewash station that meets the requirements of

Section 5162 is infeasible. He suggested that the exceptions be placed back into the standard. Mr. McCluer stated that he agreed with Mr. Weir that the exceptions were necessary. Showers or eyewashes in electrical or computer rooms are not advisable, he opined. Ms. Forchione also agreed that showers or eyewashes would be infeasible in computer rooms. The Chair stated that he wanted to refer employers to 5162 for determining whether or not the shower or eyewash was necessary because some newer battery technologies do not use electrolyte or they don't contain electrolyte that is likely to splash an employee. Referring employers to the emergency shower and eyewash standard would help employers understand what is required of them. The committee agreed that keeping the exceptions and referring employers to Section 5162 would be acceptable.

Starting with the proposed new Section 5184 "Storage Battery Systems," the Chair began reviewing each of the proposed paragraphs. He pointed out that they were taken from the 2010 California Fire Code. Bruce Zike (SMUD) pointed out that the Fire Code is often too strict for occupational safety and health since it focuses mainly on fire prevention.

The Chair asked if the Scope and Application of 5184 was appropriate. Mr. Thedell stated that the scope does not cover all uses of batteries since his company does not use batteries for storage, but rather in conjunction with solar cells for power supply. After some discussion and further thought, Mr. Thedell opined that power supplies may be better addressed in the Electrical Safety Orders as part of a separate rulemaking.

Larry McCune (Division of Occupational Safety and Health) asked if there were hazards unique to batteries greater or less than 1,000 pounds. He pointed out that requirements for fire protection may not prevent employee injuries. Mr. McCluer said that the weight and size limits of the batteries were placed into the Fire Code to avoid regulating smaller battery users. He said the values were arbitrary and work well in the Fire Code, and possibly for employee safety as well. Mr. McCune stated that the battery standard should address exposure to workers and not necessarily battery size or output. The Chair stated that he did not think the committee wanted to regulate cell phones with batteries. Mr. McCluer stated that using the word "stationary" in the scope of the Section would exclude cell phones and similar portable batteries. Mr. McCune agreed. Mr. Weir suggested that subsection (a) read "This section applies to stationary storage battery systems, used for standby power, emergency power, or uninterrupted power supplies." The committee agreed with Mr. Weir's suggestion.

The committee then discussed the definitions and to add or remove them as the committee progressed through the day.

Mr. McCluer suggested that paragraph (d) in Section 5184 read "Safety caps shall be maintained in proper working order" and that the subparagraphs be removed. Christopher So (Department of Water Resources) asked if procedures could be used in place of equipment to control thermal runaway as addressed by paragraph (e). The committee then discussed thermal runaway and other battery failure modes. Mr. Weir stated that he was not aware of any devices or equipment that can track thermal runaway. Procedures and experience are the best tools to detect and control it. Mr. Thedell stated that people who are experienced in working with batteries can be alerted to failures before they occur by observing changes in current, battery temperature, resistance, or other characteristics. Mr. McCluer pointed out that thermal runaway can occur in more battery types than VRLA or lithium metal polymer only. He suggested that the paragraph apply to all battery systems. Roger Aquino (SMUD) pointed out that batteries can have several different failure modes in addition to thermal runaway. Ms. Forchione agreed with Mr. Aquino. Mr. Weir was not sure that paragraph (e) was necessary to include in the

standard because it already exists in the fire code. He pointed out that the fire code was meant to prevent fire, but that not all failure modes pose a hazard to employees. The committee decided that the paragraph should read "Battery systems shall contain approved equipment, devices and/or procedures which preclude, detect and control failure."

The committee then discussed neutralization of spills. Mr. Weir opined that neutralization did not need to be addressed here because it was already in the fire code and addressed by Section 5185. The committee agreed.

The labelling of electrical equipment rooms and hazards was then discussed. The committee decided that the subject should be left to the fire code and not in Section 5184. The Chair pointed out that Title 8 has other regulations which address the labelling of hazards and electrical rooms. The committee decided not to add additional language to the section.

Next, the committee discussed updates to Section 5185. Mr. McCluer observed that Section 5185 did not have a scope. The Chair pointed out that many sections in Title 8 do not include a statement on scope. The committee decided that the title of the Section, "Changing and Charging Storage Batteries," is sufficient.

In discussing Section 5185 paragraph (b), the Chair asked if specific training requirements were necessary for employees who work with batteries. There was discussion on using the word "qualified" with the definition provided in Sections 1504 and 3207. The Chair explained that "qualified" meant that employees were sufficiently trained and/or experienced and held certifications where necessary. The committee decided that adding the word "qualified" would increase employee safety.

Mr. McCune stated that he would like to work on subsection (c) and address lower flammability levels (LFL) because some employers try to apply the 20% level to all areas with batteries. Mr. Zike said that it should apply in all places where an explosive potential exists. Ralph Armstrong (IBEW Local 1245) pointed out that we address explosion potentials in two paragraphs and recommended combining them into one. Mr. McCluer proposed language to address storage batteries wherever they are located and combined the two paragraphs.

He also said that explosive atmospheres should be able to be controlled by natural or mechanical means. Mr. McCune asserted that natural ventilation is often insufficient to control the atmosphere in many situations. The Chair asserted that the focus of the subsection is to keep the space below 20% LFL and that it did not matter whether this was done mechanically or with natural air movement. Mr. McCluer cautioned against allowing only mechanical ventilation, because it can fail. He also pointed out that the batteries could be in a cabinet or a warehouse and ventilation requirements would be different. He suggested that any ventilation in a large open area would be sufficient to control hydrogen build up. The Chair proposed dropping the words "natural or mechanical" and simply stating that the area must be ventilated. Mr. Weir said that he preferred to keep the words "natural or mechanical". Mr. Thedell said that using both words would clarify that not all ventilation needs to be mechanical. Mr. McCune conceded that as long as the room concentration was kept below 20% LFL, he would be satisfied with the language. The Chair asked Mr. Armstrong and Alice Hodges (Communication Workers of America Local 9421) if they had a preference and they stated none. The committee agreed to keep the phrase "natural or mechanical."

Regarding subsection (d), Mr. McCluer said that it was important to specify where a spill control kit would be stored. Mr. Weir said that his employees carry their kit on their person and argued against specifying where a kit should be stored. He said that he has hundreds of remote cell sites and would not want to place a kit in each location. The Chair asked if using the words “readily accessible” would suffice. Mr. Weir said that he preferred not to state where it should be stored specifically, but to leave the language as is, requiring only that the means to neutralize and cleanup a spill be provided. Mr. McCluer suggested using words that require adequate means to neutralize and clean up a spill. Mr. McCune said that the word “adequate” should be removed, because some spills are unpredictably large and an employer would not be expected to handle those. Kevin Barnes (TSI Semiconductors America) said that the fire code requires enough spill cleanup material to clean up 3% of the largest spill to be available. The committee agreed to remove the word “adequate” from the subsection.

The Chair asked the committee what tools should be required for handling electrolyte. Mr. McCluer said that subsection (e) as written was too prescriptive and should be more general. The committee asked if we wanted to require “an approved method” for handling electrolyte. Mr. McCluer proposed only allowing devices specifically designed for dispensing or sampling electrolyte to be used. The committee agreed that this would be sufficient to prevent the mishandling of electrolyte.

The committee discussed replacing the word “appropriate” with the word “approved” to describe the lifting and handling equipment required for working with batteries in subsection (g), but after discussion, felt that the change was unnecessary.

The committee discussed language necessary to prevent open flame, sparks, and electrical arcs in charging areas. Mr. McCluer felt that language needed to be added to ensure that storage racks were both electrically and chemically protected. Mr. Weir opined that these requirements were already implied by the standard. He feared that making a change would cause people to make a change in their storage racks when a change is not warranted. Mr. McCluer was concerned that a non-chemically resistant storage rack could lead to an electrical short if battery fluid leaked out. The committee decided to add “short circuits” to the list of conditions that should be addressed in the first sentence of the subsection and to leave the language covering storage racks unchanged. Ms. Forchione said that static discharge should also be added to the list.

The committee discussed concerns about pouring water into acid. The Chair pointed out that Federal OSHA prohibits pouring water into acid of any concentration. He proposed using the same language. The committee explained that distilled and de-ionized water are commonly added to electrolyte and that the language should remain unchanged so that it prevents water from being poured into concentrated acid as it currently reads, but allows the addition of water to dilute acid concentrations.

The discussion moved to vent caps in subsection (l). Mr. Barnes asked how someone could test that vent caps are functioning as currently required by the standard. He was unaware of any test that could be performed. Mr. Weir opined that the requirement was outdated and didn’t apply to batteries in use today. The Chair asked if we could combine the safety cap requirement from Section 5184 with this requirement. Mr. McCune pointed out that 5184 applied to storage batteries and 5185 applies to the charging of batteries. He felt they should be kept separate. The Chair asked if safety caps and vent caps were the same. Mr. McCluer said that they were different and it is important to know when one is required over the other. Mr. Armstrong proposed wording that required batteries with vent caps to have them firmly in place. The committee agreed that this would be sufficient. The Chair asserted that the

sentence “Care shall be taken to assure that vent caps are functioning” was not enforceable and proposed to delete it.

The discussion then turned to the meaning of a battery compartment cover in subsection (l). The Chair opined that the wording was likely meant to require that an enclosure with batteries inside not have a cover while batteries are being charged because the cover could trap heat and flammable gas. Mr. Weir suggested that it was similar to an automobile hood needing to be raised before charging a car battery. Because the committee was unsure of the precise meaning and effect of the sentence, it was left unchanged.

The committee determined that no changes were necessary to subsections (n) through (p). The Chair asked if other changes or additions were necessary.

The committee discussed shipping plugs and whether or not they should be required by subsection (q) instead of or in addition to vent caps. Mr. McCluer said that shipping plugs should be in place whenever a battery is moved to prevent spillage of electrolyte. He said that all batteries are shipped with the plugs installed. When the battery is installed, the plugs are removed and replaced with vents. Mr. Zike asserted that the plugs used for shipping a battery are impractical when the battery is moved short distances. Mr. McCluer stated that IEEE standards recommend installing the plugs anytime the battery is moved. The committee could not come to a consensus that a change was needed.

Next, the committee discussed personal protective equipment (PPE) requirements. Mr. Thedell said that the requirements would vary depending on the battery use. Mr. Weir said that a reference to Section 3380 Personal Protective Devices would be helpful. Mr. McCune said that sometimes a reference to a section causes interpretation problems. He said that employers can be confused if we refer them to a specific section and not others that may apply. The Chair responded that Section 3380 requires an assessment of PPE needs, but does not state which equipment should be provided. The employer would determine the PPE in accordance with the results of the assessment. Mr. Thedell said that some employers perform an online search for information. If they find Section 5185, it is helpful to be referred to other applicable sections, such as showers and eyewash and PPE. The committee decided that a reference to Section 3380 would be helpful to employers.

Subsection (r) was placed below the exception to subsection (q) to clarify that the committee believes that the exception should be limited to subsection (q) and not apply to the entire Section 5185.

The committee discussed adding a requirement to subsection (k) to require that mobile equipment be off when charging, but decided that some equipment may need to be running, such as during a jump start. The committee decided to leave the subsection as is. The Chair reviewed the definitions to determine if any additional terms were needed and reviewed the proposed text.

8. Economic Impact.

The Chair explained to the committee that an important and required part of the rulemaking process is the identification of the cost impact of the proposed rulemaking, and he asked the committee members for their assistance.

The Chair pointed out that some of the proposed text will require employees to be trained, but that there are no requirements for new equipment. The committee determined that there would be no economic impact from the proposed changes.

9. Conclusion.

The Chair reviewed the rulemaking process with the committee. He noted that the advisory committee had determined a necessity for changes and had reached a consensus on changes proposed. He stated that committee members will receive a copy of the meeting minutes, along with a copy of the final consensus proposal, within 2-3 months. They will have an opportunity to comment on them before he moves forward with preparation of a formal rulemaking proposal. The Chair noted that, although consensus on the proposal was achieved, there will be additional opportunities for public comment. A formal rulemaking proposal will be noticed in the upcoming months. The notice will be mailed-out to the committee members, so he urged them to be sure they signed the attendance roster if they want to receive a copy. The notice will also be on the OSHSB website for viewing.

There will be a 45-day public comment period, concluding with a public hearing. Anyone may attend the public hearing and provide oral comments. Changes may result from public comment and/or during the review process. If any substantive changes are made, there will be one or more additional 15-day periods for public review and comment. After that it will go to the Board for adoption at a Business Meeting. After adoption by the Board, the proposal will go to the Office of Administrative Law for review and approval and filing with the Secretary of State.

The Chair indicated that the rulemaking process may take up to a year from when the formal notice is published for public comment.

The Chair thanked the committee members for their attendance and participation and adjourned the meeting at 2:30 p.m.

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Attachment #2

OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**Advisory Committee Roster (Pre and Post Advisory Committee Mailing List)
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Value Regulated Lead-Acid (VRLA) Batteries and Storage Battery Systems

April 16, 2014

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