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## MINUTES OF THE ADVISORY COMMITTEE MEETING

California Code of Regulations, Title 8,  
General Industry Safety Orders, Section 3649, 3650, 3663, and 3669

### **Hydrogen Powered Industrial Trucks (HPIT)**

April 11, 2019  
Sacramento, CA

The Advisory Committee (AC) meeting was convened by Occupational Safety and Health Standard Board (OSHSB) staff. Documents including the text of the draft proposal, a side-by-side comparison showing the counterpart federal standards and the rationale for the requirements, and three comments received on the draft proposal, were provided to the invited participants in advance of the meeting date. OSHSB staff had asked each person listed in the meeting roster for their review and discussion of the draft proposal and the comments received. Similarly, the handout of the OSHSB staff presentation was also provided to the AC participants in advance of the meeting date.

#### **1. Call to Order**

The AC meeting was called to order by the Chair, Manohar Kaphle, Senior Safety Engineer, OSHSB, at 9:30 a.m. on Thursday, April 11, 2019, in Sacramento, CA. The Chair was assisted by Leslie Matsuoka, Associate Governmental Program Analyst, OSHSB.

#### **2. Opening Remarks**

The Chair welcomed the attendees, and started self-introductions of the committee members. He explained the purpose of the meeting was to discuss and determine consensus recommendations on:

1. If California needs occupational safety and health requirements for hydrogen powered industrial trucks (HPIT).
2. If AC has a consensus opinion that California needs the requirements, what should the requirements be, and what will be the economic and fiscal impacts of the requirements.

The Chair then reviewed OSHSB's policy regarding the use of ACs stating it is OSHSB's practice to involve the public, management, labor, and experts to make the meeting process transparent; the Board has found AC meetings to be an effective way to aid in the development of a proposal due to the expertise of the attendees; the meetings are informal and advisory in

nature; and although OSHSB staff considers the AC's consensus recommendation during the proposal development, it may be necessary to change or reject the recommendations during the rulemaking process.

### **3. Presentation by Chair**

Using a PowerPoint presentation that was provided to AC before the meeting date, the Chair briefly described HPITs and mentioned they involved multiple components and consensus standards. He also mentioned the draft proposal was initiated by OSHSB staff, and based upon numerous elements of necessity:

- The workplace hazards and risks from hydrogen are significant.
- The number of employees operating HPITs is in the thousands and steadily increasing.
- No current OSH requirements specific to HPIT exist in California Title 8 regulations.
- Requiring employers to meet applicable industry standards and government codes enhances employee protection from workplace hazards.

### **4. Establishing Necessity for the Rulemaking**

The Chair provided information from Board staff research on each of the above four necessity points.

The Chair cited examples of accidents involving HPIT and hydrogen fueling. Stephen Goyette of Nuvera Fuel Cells commented that some of the accidents cited were not actually due to hydrogen fuel cells and fueling. Jennifer Hamilton of California Fuel Cell Partnership provided some details on the AC Transit fueling accident in Emeryville, California, and mentioned recent accidents that involved vehicle movement during fueling at two retail hydrogen fueling stations.

The Chair estimated the number of HPITs in California to be around 2,700, and based on a two-shift operation, the number of operators driving these trucks to be around 5,400. Mr. Goyette commented that these estimates were not inaccurate. In addition, Mr. Goyette stated how there were advantages of fuel cell powered trucks over electric battery-powered trucks in terms of frequency of changing the power pack, handling, emissions, and waste management.

Mike Manieri, the Principal Safety Engineer of OSHSB, mentioned that Title 8 of California Code of Regulations covered hydrogen/flammable gas safety but did not specifically address HPIT safety. He stated it was necessary to protect the employees operating the HPITs.

Jason Denning of the Division of Occupational Safety and Health (Division) stated they wanted to remain proactive on employee safety. He mentioned that the Division had regulations for

hydrogen facilities and trucks using other flammable gas fuels, and supported this rulemaking for the trucks using hydrogen fuel.

Ms. Hamilton opined that the proposed regulation for HPIT is not prohibitive nor too restrictive compared to the regulations for other types of trucks, and has allowance for further development and maturation of the industry.

Mitch Steiger of the California Labor Federation mentioned the proposed regulation made sense; giving examples of how adding a no-smoking requirement, and a requirement to have clear instructions for fueling help employees and employers on work safety, as well as the Division with their enforcement work. He further mentioned having a regulation protecting against future accidents and providing guidance and clarity to employers and enforcement made sense.

Crystal Sujeski of The Office of the State Fire Marshal stated the no-smoking requirement for the hydrogen dispensing facilities was already covered by the California Fire Code. She did not see a problem with having a regulation for the HPIT as long as the requirements correlated with other regulations.

Mr. Steiger shared his concern for which standard currently covered the no-smoking requirement in the proposal, California Fire Code or Title 8, Section 3203, Injury and Illness Prevention Program (IIPP) requirements, and asked Mr. Denning's input. Mr. Denning mentioned the Division would not have jurisdiction if there were no citable occupational safety and health standard.

Mr. Goyette queried the Division representative about the IIPP. Mr. Denning explained that IIPP was the basis for an employer's safety program. Mr. Goyette said such conversations were good, and it was important for the AC to keep focus on the subject matter and scope of HPIT safety, and prevent conflicts with the already existing standards. Mr. Denning stated he also wanted harmonized codes so there would be no conflicts among regulations.

The Chair mentioned that AC input was important in the development of the draft proposal, and asked the committee members to provide him a recommendation if any occupational safety and health requirements for HPITs were needed in California.

Mr. Steiger stated he believes a standard is necessary, citing examples of how it would help the Division's Consultation program in assisting with workplace safety, and employers/employees in knowing what they needed to do in order to remain safe. He indicated he is in support of the proposal.

Mr. Goyette asked if the proposal was about the operator rules or the design and construction requirements. Chris Merther of the Industrial Truck Association (ITA) echoed a similar question. Mr. Manieri mentioned looking at the draft proposal may provide answer to those questions, and the AC could decide if the proposal was necessary or not. Christina Shupe of OSHSB brought to everybody's attention that all of the plain text already existed in the standard, and the underlined text was the new text and the strikeout text was proposed for deletion.

The Chair presented the highlights of the draft proposal and mentioned the proposal was developed to the current form using input from several people including some of the AC members. The comments received after the AC invitation were provided to all stakeholders and AC committee members prior to the AC meeting. The Chair asked the AC committee members to review the proposed draft and the comments as needed and asked them to provide a consensus opinion if a regulation for HPIT was needed. He also asked all others present in the room (not at the AC table) to feel free to comment on the AC discussions.

Mr. Goyette mentioned a presentation of the highlights of the rulemaking would help those who are unfamiliar with HPIT in further discussions.

Ms. Shupe commented about the concerns and information bring discussed by the A. She stated however that she did not hear the necessity being specifically discussed. She suggested the AC discuss the necessity and share concerns about producing the regulation.

Mr. Goyette stated there are eight or ten organizations writing codes on HPIT and that can potentially result in conflicting codes if developed without research. He said he was concerned the AC may end up with more conflicting codes.

Ms. Hamilton said referring to a specific edition of standard in the proposal may be counter to innovation and growth as the old standard becomes obsolete and new edition comes out. Mr. Manieri said similar problems exist for other technologies; however, the regulations need to refer to specific editions of the standards. He added, if OSHSB finds the references to be outdated and regulations lacking, future rulemakings may be initiated to update the references.

The Chair explained that the proposal did not add any new consensus standards, rather added occupational safety and health requirements in Title 8, most of which reference existing consensus standards. Mr. Goyette said making reference to the standards in the proposal was the right approach; however, he had a concern over keeping up with revisions to the standards.

The Chair asked the AC members if having requirements in Title 8 for HPIT would help save California employees from injuries. Mr. Goyette said he personally did not think it would improve employee protection, as there had been only one potential event while thousands of

HPITs have been in operation for many years. He further said the industry being new, everybody involved has been working together to keep the industry safe, and he did not think additional regulation was needed.

Mr. Steiger commented having one event documented or not having a long list of documented events does not mean that accidents will not happen. He further mentioned many accidents go unreported in workplaces.

Ms. Hamilton mentioned safe operation of the HPIT is important, and reminded the AC members that an HPIT is another kind of truck.

Upon asking by the Chair if an electric battery pack can be swapped for a hydrogen fuel cell, Mr. Merther said replacing electric batteries with fuel cells was more involved, and that the installation needed manufacturer's approval. Hanna Ettenberg of Plug Power mentioned her company specializes in direct conversion and the fuel cells could be designed to fit in the electric battery compartment, making swapping easier.

Ms. Sujeski mentioned the regulation was not only about the forklifts but for other types of trucks too, and NFPA 505 already provides the definitions for these trucks.

Mr. Manieri said he did not see which way the AC was going on the necessity, and asked if it would help the AC to see the draft proposal in underline and strikeout format. Mr. Goyette said the primary concern he heard in the meeting is there is no way to enforce (requirements) at the present time. He mentioned this concern is different from what he normally thinks of safety and accident prevention. He then said he would support the rulemaking if it were needed to clarify enforcement.

The Chair voiced his observation that the AC members consensus seemed to be to move ahead with the rulemaking and asked if there were any objections. No objections were raised.

The Chair asked individual committee members what his or her view was on the necessity.

Ms. Hamilton said she would propose her suggestions while looking at the proposed language. Mr. Denning said he supports the regulation. Edward Hardiman of Caltrans mentioned the standard will be the guideline for safety of their employees and supports the regulation. He indicated a regulation is necessary for California. Jeffrey Janes of Hyster-Yale, who was invited as a manufacturer's representative in the meeting, mentioned he supports the regulation as long as there are no conflicts with other standards. Mr. Merther stated he understands California needs a regulation for enforcement. Mr. Goyette said he supports the rulemaking if California wants to pursue one. Mr. Steiger said he supports the regulation and asked to preserve industry quality

standards that keep people safe. Ms. Ettenberg said she agrees California needs the regulation. Ms. Sujeski recommended using task group to identify downfalls and duplication while developing regulation, and correlate with other standards where it was needed for enforcement.

After comments from each AC member, the Chair asked if everyone was ready to discuss the proposal. With general agreement and no objection, the Chair stated to the group there was consensus that a rulemaking for HPIT was needed for California. The AC proceeded to review the proposal.

### **5. Review of the Draft Proposal and Comments**

The Chair informed the AC that the previously provided side-by-side document had OSHSB staff's rationales for the new requirements. He mentioned the draft proposal was only for reference for the group and asked to change/add/delete as the AC felt appropriate.

The Chair started presenting the draft proposal section by section. First, he reviewed the new definitions added in Section 3649. Mr. Goyette recommended using the existing definitions in NFPA 505 in place of drafting new definitions in order to avoid conflicts. He also recommended not adding the word "gas" in the definition of "Type Designation CGH" as compressed hydrogen is already a gas. Mr. Manieri provided information that the definitions in the consensus standard can be rewritten if needed for clarity.

Mr. Denning commented having the definitions in the proposal was important. Ms. Sujeski suggested to follow existing format for the terms, and recommended to use "Industrial Trucks, Hydrogen Powered" in place of "Hydrogen Powered Industrial Trucks", and avoid using acronyms in definitions. She also brought up potential copyright issues from using contents verbatim from other standards. Mr. Manieri mentioned there should be no copyright issue from using individual definitions shared with other standards.

As part of his comments on the draft proposal, Mr. Goyette had sent a PowerPoint presentation to the Chair. The AC did not have a chance to previously review the presentation as it was received a few hours before the meeting started. Mr. Goyette asked if he could present the PowerPoint presentation, and the Chair agreed to his request. Using the PowerPoint presentation, Mr. Goyette provided comments on the draft proposal. He mentioned making reference to existing codes and standards as much as possible, and avoiding writing new codes. He said the existing codes already deal with most of the issues including system and processes, patents, protection techniques, use of overly prescriptive requirements, and code duplication.

Mr. Goyette also presented information and comments on labeling, approval, hazardous areas, conversions, and fueling of HPIT. He shared information on the existing codes and standards,

and major updates in progress to the NFPA 2 Hydrogen Technologies Code published by the National Fire Protection Agency (NFPA), and recommended the AC and OSHSB staff wait for the updates to be finalized. His primary comments on the draft and recommendations for the HPIT regulation were:

- Have the truck designed, constructed, labeled, and approved in accordance with ANSI/ITSDF B56.1 - Safety Standard for Low Lift and High Lift Trucks.
- Have all liquid and gaseous fueled industrial trucks fueled in accordance with Section 2309 of California Fire Code.

During his presentation, Mr. Goyette opined that referring to California Fire Code would prevent copyright problems associated with referring to SAE J2601-3 Fueling Protocol for Gaseous Hydrogen Powered Industrial Trucks, a privately patented fueling protocol, in the proposal.

The Chair asked if he needed to continue presenting other Sections of the draft proposal. The AC decided to review the sections as a group, and started a section-by-section review and recommendations.

#### **Section 3649. Definitions.**

The AC discussed the definitions of HPIT and Type Designation CGH. Ms. Sujeski had earlier suggested to use the term “Industrial Trucks, Hydrogen Powered”, and spell out the acronym “CGH”. She mentioned using the term “Industrial Trucks, Hydrogen Powered” is for formatting per Title 19 and Title 24 and becomes more user friendly. She also mentioned typically, acronyms were not used in the standards.

Mr. Denning pointed to the nonmatching acronym “HPIT” used in the definition, and inquired how HPIT was listed (in other standards). The Chair said “HPIT” was listed in the CSA HPIT-2 Dispensing Systems And Components For Fueling Hydrogen Powered Industrial Trucks standard (published by the CSA Group) as hydrogen-powered industrial truck. Mr. Denning said he did not see any problem using the term “hydrogen powered industrial truck”. Mr. Manieri stated Ms. Sujeski’s term conforms to the presentation in Title 8 and helps clarity.

Ms. Hamilton questioned if the type designation definitions below the definition of HPIT should be removed. She commented having the definition of HPIT before the definitions for type designation could be redundant and confusing. Mr. Manieri said having the terms in the regulation helped clarity.

Ms. Shupe commented on the discussion about deleting the word “electric” before “industrial truck”, and the words “fuel cell system” at the end of the definition of HPIT, and asked if doing

so was the AC consensus position. Ms. Shupe also asked if it was correct that consensus on not using the acronym “CGH”, but using the term “compressed gaseous hydrogen”, and using “CGH” in parenthesis. With no objection on either question, a consensus was reached to recommend having the definition for HPIT as “A Type CGH (compressed gaseous hydrogen) industrial truck powered by hydrogen.”

The AC then discussed the definition of type designations. Mr. Goyette asked if the type designation definition concerned the whole NFPA 505 standard or just the definitions. Mr. Denning stated that it concerned only the type of trucks and their definitions. After the discussion, the AC had a consensus on the definitions of the type designations. Following the previously mentioned recommendation of Mr. Goyette, the AC decided to recommend using the NFPA 505 definition of “Type Designation CGH” by deleting the word “gas” after the word “hydrogen”.

There being no further comments on the definitions, the Chair directed the AC to deliberations on the design, construction, and operational aspects of HPIT.

### **Section 3650. Industrial Trucks. General.**

#### Design and Construction

The Chair provided information on the proposed changes for Section 3650. He informed the AC while Section 3650 had UL 583 requirements for the labeling of electric battery powered industrial trucks, there was no requirement for HPIT, and stated new text was added in the proposed draft for HPIT following the pattern for the electric battery powered truck.

The AC discussed the design and construction requirements of subsections (a) and (b) including the newly added subsection on the design and construction requirements for HPIT.

Mr. Goyette said the existing language in Section 3650(a) was different from the proposed language for HPIT labeling, and asked the group what a label was. He said the proposed language seemed more stringent than the existing language. The AC discussed the meaning of the terms, approved, labeled, listed, and certified. Mr. Denning explained that labels were not defined in Title 8 of the CCR, and were not required to be approved. The Chair said the purpose was to have a requirement for the HPIT consistent with what existed before, and asked AC members for their opinion. After the discussion, Mr. Goyette said he agreed with the approach. He added he was being careful with the legal difference in the wordings so that there would be no unintended consequences.

Mr. Denning commented that regulations including all industrial trucks standard have the labeling requirement (Section 3650(a)) for industrial trucks), and so does the fall protection requirement. He commented there would be no problem having a labeling requirement.



Ms. Sujeski mentioned that the regulation used the same consensus standards, from different years in Sections a(1), b(1), and b(2), and the new requirement for the HPIT used new standard, which she felt could cause conflicts in codes. She recommended deleting “All” from the proposed subsection 3650(b)(4). Ms. Sujeski also suggested updating the standards listed in those sections. Mr. Denning agreed listing two different NFPA 505 standards can be confusing, but the manufacturing dates resolve the conflict.

Mr. Goyette suggested not referring either of the two standards (CSA HPIT 1-2015 and NFPA 505-2018 mentioned in the proposed draft) and refer to ANSI/ITSDF B56.1 as it has all references built into it. Ms. Sujeski asked which edition to use, and Mr. Manieri asked what the standard covered – design, construction, use, care or none. Mr. Goyette said it covered all, and the latest version of the standard should be used.

AC members discussed use of the ANSI/ITSDF B56.1 standard to provide the design and construction requirements for the HPITs. The discussion also covered if the standard should be applied retroactively. Ms. Sujeski reminded the AC to keep in mind the cost implications from the rulemaking for the retroactive application of the standard.

Mr. Hardiman said he liked the idea of referring to one standard, however was not sure if the ANSI/ITSDF B56.1 standard applied to all industrial trucks as the standard had Safety Standard for Low Lift and High Lift Trucks in its title. Mr. Denning mentioned Title 8 listed different type of trucks as industrial trucks. Upon questioning by Mr. Manieri if the HPITs could be listed like other types of industrial trucks in the standard, Mr. Denning indicated that would be the case. Mr. Merther said all that was needed was a reference to the ANSI/ITSDF B56.1 standard.

The Chair asked questions on the applicability of CSA HPIT standards referenced in his draft proposal. Mr. Merther stated the UL 2267 standard for the HPIT fuel cells was developed years before the CSA HPIT standards, and the Industrial Truck Association was not aware of any HPIT manufacturers in Canada. Mr. Goyette mentioned the CSA Group is the standard setting organization for US and Canada, and stated it is the leading organization for certifying hydrogen related equipment, and has the most experience in that area. Ms. Hamilton commented the CSA standards were US standards, and a technical committee was also working on making them applicable to Canada. She mentioned their development was driven by industry experts.

The Chair asked the AC if the reference will be made to only one standard (ANSI/ITSDF B56.1). Mr. Goyette commented that a single standard might not work as the standard referred only to high and low lift trucks.

Mr. Manieri asked if ANSI/ITSDF B56.1 standard covered only high and low lift hydrogen trucks. Mr. Merther mentioned it referred to UL 583, which referred to UL 2267, which was going to be updated to refer the HPIT (CSA) standard. Mr. Denning mentioned the ANSI/ITSDF B56.1 standard referred only to the low and high lift trucks and there were subsequent standards covering other type of trucks. Mr. Manieri commented the scope in this rulemaking could be narrowed to the trucks covered in ANSI/ITSDF B56.1 and expand to other type of trucks in future as technology develops. Mr. Denning agreed with Mr. Manieri's suggestion.

Mr. Merther brought to the AC's attention that ANSI/ITSDF B56.1 recently had a change from electric battery to electric power source to cover all types of electric power sources, and the change was approved for the next version. Ms. Shupe queried when the change was coming. Mr. Merther mentioned the change was coming before the end of 2019.

Ms. Ettenberg stated they were not aware of the ITSDF standard and showed concern if ANSI/ITSDF B56.1 covered all types of trucks. Mr. Merther clarified that the standard covered design and construction of whole new trucks, and that it referenced UL 583, which internally referenced other standards. Mr. Janes added the most recent UL 583 standard not only referenced UL2267, but also had language for HPIT, although it still had electric battery-powered in the title.

Consequently, the AC collectively identified ANSI/ITSDF B56.1a (2018) as the appropriate standard to cover the requirements for the design, construction and operation of HPIT, and recommended referring to it in place of CSA HPIT 1-2015 and NFPA 505-2018 in the proposal.

Upon raising a question by Ms. Sujeski, if the word "applicable" needed to be deleted from the subsections (a), (b), and the proposed (c), there was a consensus that the word created confusion and recommended deletion.

### Conversion

The Chair mentioned that there was already a requirement for conversion of gasoline fueled trucks in subsection 3650(f), and therefore, proposed to add conversion requirements for the HIPT within the same subsection. He asked the AC for its recommendation.

Mr. Goyette recommended replacing NFPA 505-2018 and CSA HPIT 1-2015 with UL 2267 (2013). He said the UL 2267 addressed the whole fuel power system, where as the CSA HPIT 1 had a limited scope covering only the fuel system components in the fuel power system. He further said the CSA HPIT 1 standard was being referenced in the next edition of UL 2267. With no objection or further discussion on Mr. Goyette's suggestion, the AC concluded to reference UL 2267 (2013) for the conversion requirements.

The AC discussed the truck manufacturer's approval of the conversion in depth. Ms. Sujeski suggested rewording the approval requirement as she thought the system needed to be listed for use with hydrogen, and not necessarily be manufacturer specific. Mr. Janes mentioned the approval of the fuel cell system was not specific to the application and that the manufacturer of the truck should have opportunity to confirm the safety of the system in their vehicle. Ms. Sujeski asked how the manufacturer could enforce compliance. Mr. Janes mentioned there should be a label confirming compliance after the conversion. He said the truck needed to be labeled appropriately.

Mr. Goyette pointed that UL 2267 included the language for requiring labeling after the conversion. The Chair provided a copy of the UL 2267 (2013) standard to the group for review and discussion. The AC discussed the labeling requirement for HPIT, and came to a consensus to recommend using the language from UL-2267 (2013) subsection 19.3c in place of the language requiring manufacturer's approval in the draft proposal.

#### Operating in Hazardous Atmosphere

The Chair mentioned proposing to reference the 2018 version of the NFPA 505 standard was due to the reason that the currently referenced 1982 version did not cover the HPITs. Mr. Goyette said the NFPA 505 was too restrictive for the HPITs as it allowed operation only in Class III Division 2 areas.

Mr. Manieri asked what standard applied to HPIT operation in explosive areas. Mr. Goyette said everybody, including NFPA 2 (which is specific to hydrogen technology), referred to the National Electric Alliance for the codes. He preferred not using the NFPA 505 until the standard was developed further.

Ms. Sujeski said the NFPA 2, which is referenced in the California Fire Code, addressed some of the fire safety procedures in the building environment. She added, while not specific to trucks, it dealt with hydrogen within the facility. The Chair mentioned he received comments from stakeholders asking to make references to California Fire Code as much as possible. Mr. Denning said he thinks the California Fire Code covers the requirement to the best of the AC's ability at that time, as the NFPA 505-1982 did not cover HPIT.

Mr. Merther mentioned the truck manufacturers generally dealt with new construction and not the application where the new truck was going to be used, and did not have specific recommendation as to which version of NFPA would be appropriate. He said he believed the manufacturers were very familiar with the NFPA standards, and probably refer to the most recent versions of the standards for their use.

After the discussion, the AC reached a consensus recommendation to continue referring the 1982 version of the NFPA 505 standard for other type of trucks and add an exception for HPITs to reference the Chapter 23 of the California Fire Code.

### **Section 3663. Maintenance of Industrial Trucks.**

The Chair explained that the addition of a new title (“Truck Conversion”) for the subsection was for clarity, and the addition of new language for the HPIT was to match the existing language for other type of conversion. He then asked the AC to provide their recommendation on the proposed language.

Mr. Denning recommended having the conversion requirement for the trucks only under the subsection for Truck Conversion to avoid duplication and confusion. Ms. Sujeski commented avoiding duplication was a procedural rule, and the duplication would probably be removed later in the processes. Upon the Chair’s asking what to do with the existing language in subsection (h), Mr. Denning recommended deleting the subsection. With no further comments and objection, the AC reached a consensus to delete subsection (h).

### **Section 3669. Fueling of Industrial Trucks.**

The Chair asked the group for their recommendation/changes on the fueling requirements for the HPITs in the draft proposal. He also reminded the group that he had forwarded the comments received on the draft proposal.

Mr. Goyette suggesting extending the scope of trucks for fueling from “hydrogen-powered” to “liquid and gaseous fueled”; delete the requirements proposed in subsection (a)(1) and (a)(2) of the draft proposal; and make a reference to the California Fire Code for fueling requirement. He also suggesting referencing Chapter 10 of NFPA 2, Hydrogen Technology Code for the fueling protocol, and mentioned that would avoid the patent problem associated with SAE J2601-3. Mr. Goyette also suggested addressing operating instructions for all three areas (the dispenser, truck, and the fuel cell power system), and replace the words “powered-off” with “be prevented from moving” to prevent truck movement during fueling.

Ms. Sujeski said the 2019 California Fire Code addresses fueling and dispensing related procedures, emergencies, shut-offs, and protection mentioned in the draft text. The AC discussed whether to reference Section 2309 or Chapter 23 of the 2019 California Fire Code for fueling requirements. Ms. Sujeski said Chapter 23 was more inclusive and she thought could be appropriate for the intent of the draft proposal.

Mr. Denning expressed his concern for Chapter 23 not being specific to HPIT. The Chair said Section 309 of the California Fire Code had requirements for the fueling of industrial trucks. Mr. Goyette preferred Section 2309 as it was listed for HPIT in the table of contents of the Fire Code, and said Chapter 23 could be used if appropriate. Ms. Sujeski mentioned Section 2309 could not be adopted by the State Fire Marshall as it was a non-building standard and would be adopted by the local agencies. Mr. Denning stated CalOSHA could adopt the Section 2309 standard.

Mr. Steiger mentioned he is concerned for the training of employees since the technology is new, many employees have not seen or operated HPIT, and the hydrogen fuel is highly flammable. He suggested providing at least a sentence, saying something like the operator shall receive training on fueling operation, for the training requirement.

Mr. Goyette read a sentence from subsection 2309.4 of the California Fire Code that mentioned training of employees and operators who use and maintain the system in accordance with Section 406 of the California Fire Code. After discussion, there was a consensus that the training for fueling was covered by the referenced California Fire Code.

The Chair asked about the AC's recommendation for the requirements for durable and legible signage, and the location of the emergency stop per the draft proposal. Ms. Sujeski stated they were already covered in the California Fire Code. She said a recent code package for mobile fueling of gaseous hydrogen included language for training that could be used for the proposal. The new code stated training records of the operators shall be maintained. Mr. Steiger said the requirement sounded good, but employers wanted to know how long the records should be maintained, and asked if this was covered by any other CalOSHA standards. Mr. Denning and Mr. Manieri stated Section 3203 (IIPP) of Title 8 adequately covered the record retention.

Mr. Denning indicated the need to review the upcoming California Fire Code for the training requirements. Mr. Manieri said Board staff needed time to review it further while developing the proposal.

Ms. Sujeski asked why the requirement for monitoring of the fueling operation by an "attendant" was needed. The Chair answered similar language was used in another Title 8 standard (Section 528 of the Title 8 Unfired Pressure Vessel Safety Orders). Ms. Sujeski said "operator" would be a better word. The AC discussed the terminology and reached consensus to recommend using "operator" in place of "attendant".

The Chair asked about the AC's recommendation on which fueling requirements to follow and asked if the words "incorporated by reference" could be deleted. Mr. Goyette restated his earlier suggestion of following Chapter 10 of NFPA 2 for the fueling protocol, following the dispenser, truck and fuel power system operating instructions, and not having the requirement for the

signage displaying the dispenser operating instructions. With no further discussions, comments and objections from the AC members, there was a consensus to follow Mr. Goyette's recommendation. The AC recommended the words "incorporated by reference" be deleted.

Mr. Goyette suggested to remove the no smoking requirement from the draft proposal as it was already included in the California Fire Code, and there was consensus support.

Ms. Sujeski suggested language requiring the driver, operator, or attendant not to remain inside the cab during fueling, and inquired the meaning of monitoring. She mentioned the language she provided was a modified version of the language in the mobile fueling section of the California Fire Code. Ms. Sujeski said she would email the exact language from the California Fire Code for Board staff's consideration.

Mr. Denning brought up monitoring and remaining outside of the cab were two different things and further stated that the subsection for the monitoring requirement needed additional wording such as safe fueling.

The AC discussed in detail where the driver, operator, or attendant should be during fueling, and if open-cab/closed-cab vehicle would make the requirement different. Mr. Manieri asked where the language requiring monitoring during fueling came from. The Chair informed the AC that the language came from Section 528 of the Title 8 Unfired Pressure Vessel Safety Orders.

Mr. Goyette mentioned other standard setting organizations are very specific with their application on where the driver should be while fueling. He opined that, for the hydrogen fueled cars, it would be unsafe for the driver to remain inside the closed cab while someone is fueling the vehicle, and expressed a concern for closed-cab HPIT too. He indicated an open cab HPIT in a warehouse could be a different case.

Ms. Sujeski mentioned the procedure developed by CalFire's task group for hydrogen mobile fueling requiring the driver, operator, or attendant to remain outside during fueling was also for the monitoring the fueling operation. She said requiring the driver, operator, or attendant to remain outside would also promote a level of safety awareness. Mr. Denning mentioned the driver, operator, or attendant needs to be outside the truck, whether the truck was close-cab or open-cab, for his or her safety and also to monitor the fueling process.

After the discussions the AC recommended requiring the driver, operator, or attendant be outside the truck during fueling and monitor the safe fueling operation from the fueling station.

Mr. Goyette restated his preference to require preventing HPIT from moving during fueling. He and Ms. Ettenberg shared information on the common methods/systems available to prevent

truck movement and associated hazards. With no further comments or objections, the AC reached a consensus recommendation prohibiting HPIT movement during fueling.

This concluded the section-by-section review of the draft proposal by the AC.

### **6. Economic Impact**

After receiving the AC's consensus recommendations on the proposed requirements for HPIT, the Chair asked the AC for an opinion on the number of HPITs and number of employees impacted by this potential rulemaking. He restated his estimates of around 2,700 HPITs and 5,400 impacted operators in California. Ms. Sujeski mentioned national data might have the information and she may be able to provide the data. Ms. Ettenberg said she could provide the data for California.

The Chair also inquired if the AC had information on number of businesses and small businesses operation the HPITs in California mentioning that a business was considered small business if it had 100 or less employees. Ms. Hannah volunteered to provide the data.

No specific concerns were raised regarding economic impact except for making the assessment of impact California-specific.

### **7. Conclusion**

Finally, the Chair reviewed all of the AC's consensus recommendations using a typed draft (attached) prepared by Ms. Matsuoka. There being no further comments on the typed draft, the Chair thanked the AC members for the recommendation, and their participation and assistance.

The Chair stated that the minutes of the AC meeting, an updated attendance roster, and a draft proposal would be provided to the AC members for review and comments. At 5 p.m., the Chair adjourned the meeting.