2016 - Safety Shower Survey for Campus Safety Health and Environmental Management Association (CSHEMA) members

http://www.cshema.org/

Introduction

Approval of an American National Standard requires verification by the American National Standards Institute (ANSI) that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer. Consensus is established when, in the judgment of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. The procedures of ANSI require that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of publication[1]. The Secretariat for the ANSI/ISEA Z358.1-2014 Standard is the International Safety Equipment Association (ISEA).

The latest Z358.1 American National Standard for Emergency Eyewash and Shower Equipment – the Standard - went through the prescribed approval process in 2014 with participation of representatives from the University of Georgia, the University of Michigan, Evergreen State College, APPA and others. At the time the 2014 Standard's language was discussed, APPA-Leadership in Educational Facilities and the University of Michigan Hospitals and Healthcare Centers advocated for less than weekly activation of water flushing devices described by the Standard. The University of Michigan cited a water quality study by Chuanwu Xi, PHD, titled "Survey of Water Quality in Eye Washing Stations at the University of Michigan" substantiating this request.

The secretariat (ISEA) rejected this change proposal stating[2]:

> "Until additional information or peer reviewed studies can be identified and validated, the standard drafting group is unwilling to change the long-established weekly interval for operational verification, which has existed since the 1981 version. For a subsequent revision cycle, ISEA may pursue identification of resources and other related documentation that can assist in making an informed justification of such a change. This will also allow time to explore the possible change with all stakeholders who utilize, install or regulate emergency eyewash and shower equipment."

In preparation for the 2019 Standard approval cycle the Standard content was again discussed at the 2016 CSHEMA conference in Austin, TX. The CSHEMA Board approved Northwestern University advocacy for the CSHEMA membership. In several discussions it became clear that a weekly prescribed activation of safety showers was not the commonly accepted industry practice. Other parts of the Standard could benefit from clarification and improvement. The benefit of ownership and the benefits of prescribed maintenance activities should be measurably risk based and not just anecdotal and hypothetical. In follow up, a safety shower survey was developed and circulated.

[1] Paraphrased from ANSI/ISEA Z358.1-2014 Section titled "American National Standard"
[2] Cristine Fargo, ISEA to Bruce Cadwallander, University of Michigan Hospitals and Healthcare Centers, Re: Response to Negative Ballot on Revised Standard ANSI/ISEA Z358.1; Sep 11, 2014

Methods

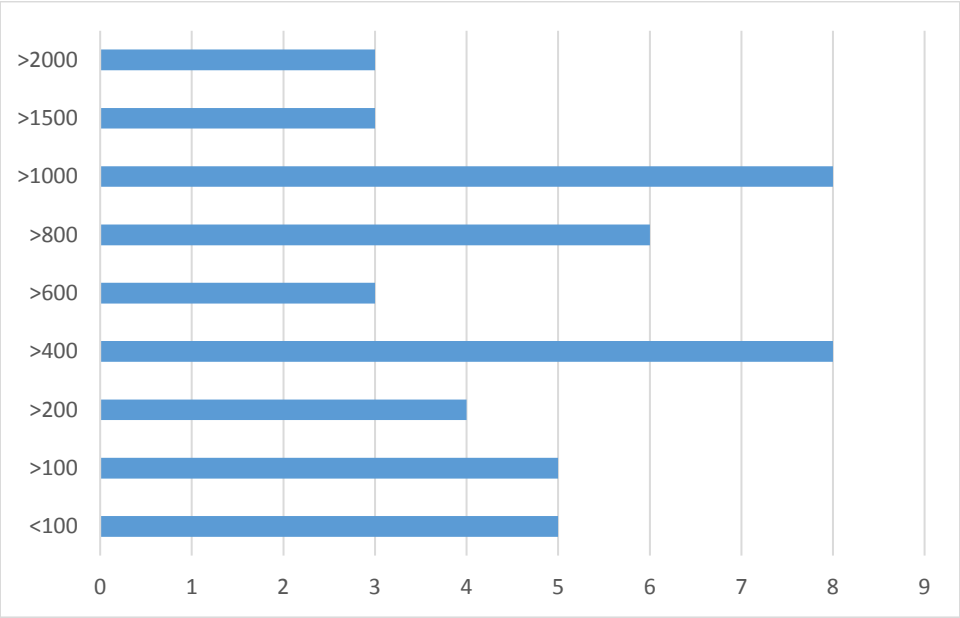
The 2016 - Safety Shower Survey for Campus Safety Health and Environmental Management Association (CSHEMA) members was distributed to the 400 CSHEMA members through the CSHEMA list serve and email. Responses were collected in September - October 2016. Some responses were followed up by email to clarify responses. The CSHEMA survey was specifically focused on the ANSI/ISEA standard language for safety showers. The results of the CSHEMA survey are shown below.

A similar survey was also distributed by APPA Leadership in Educational Facilities http://appa.org/ .

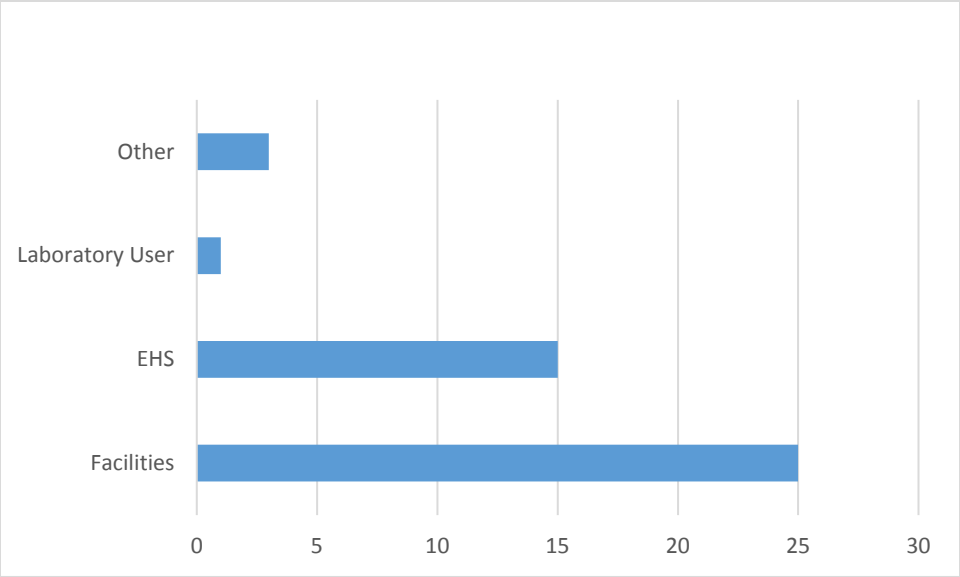
Results

There were 45 colleges and universities who responded to the survey by Oct 10, 2016. The survey questions and results are listed below.

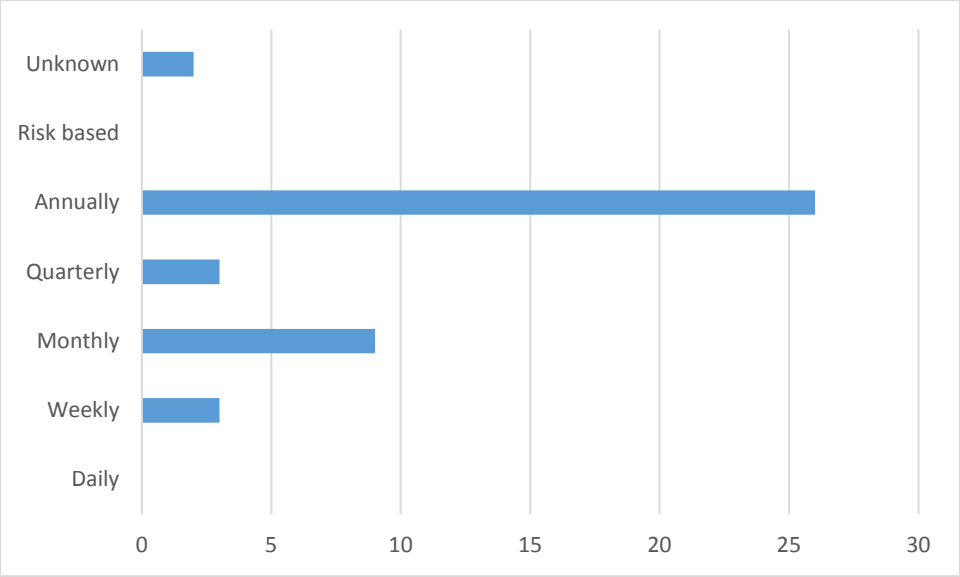
1. How many laboratory safety showers does your institution maintain?



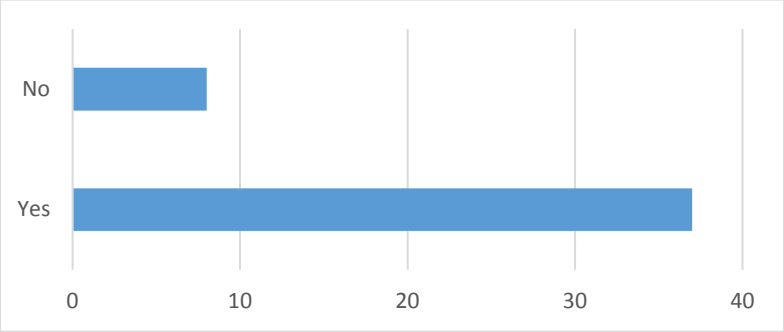
2. Who does the annual safety shower inspection?



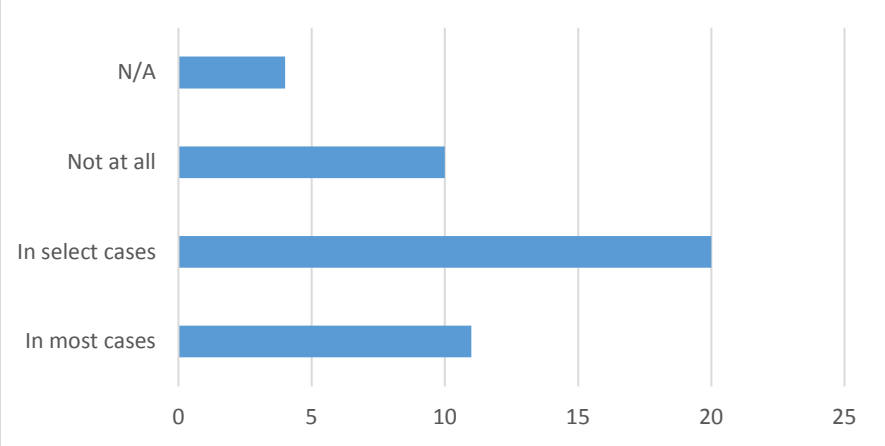
3. How often are the laboratory safety showers actually activated to test for water flow?



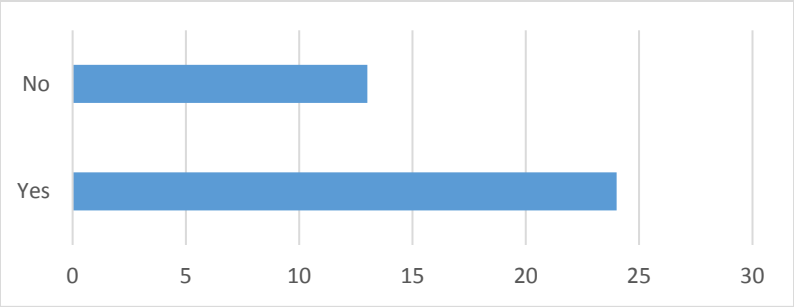
4. Does your facility have some laboratory safety showers installed in hallways outside the laboratory door? Y/N



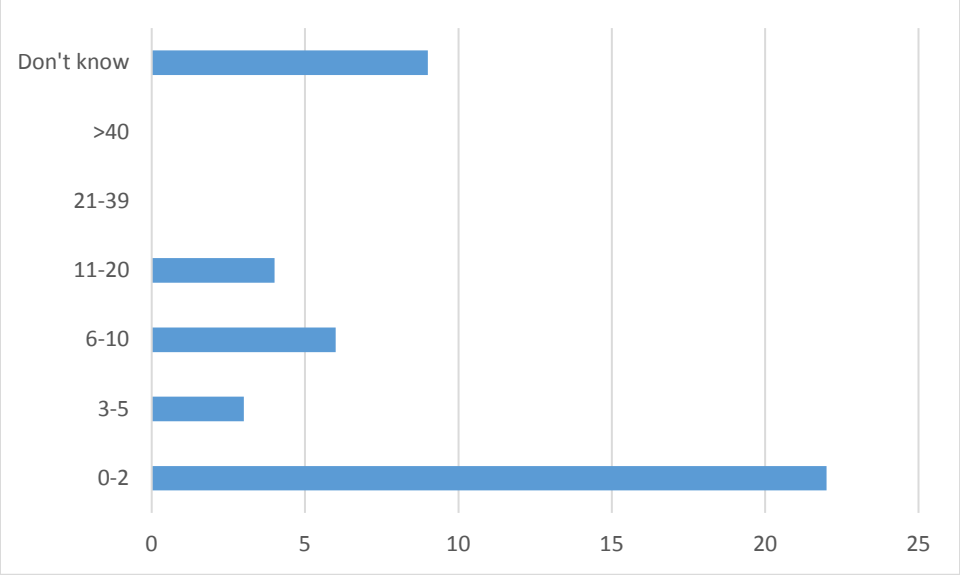
5. Does your EHS department support the installation of new safety showers in hallways outside a laboratory?



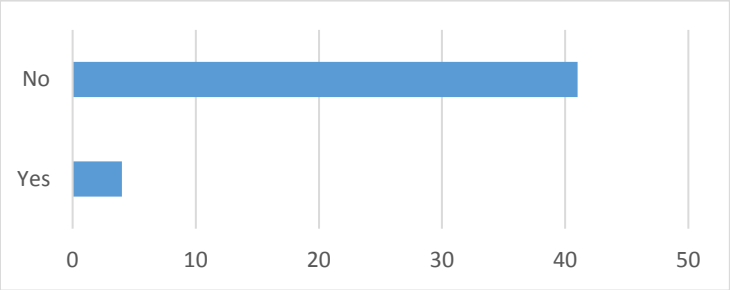
6. Do your laboratory incident reports indicate if a safety shower was used? Y/N



7. How often was the use of a laboratory safety shower reported in a laboratory emergency in the last ten years?



8. The requirements of the current American National Standard for Emergency Eyewash and Shower Equipment ANSI/ISEA Z358.1-2014 fulfills the institutions need. Y/N



9. If No, please indicate what standard language changes you would like to see

The respondents' answers were paraphrased and shortened.

- Make ANSI/ISEA standards language less prescriptive and more performance based
- Reduce the frequency of activation. Weekly activation frequency of safety showers is too often.

- Need more scientific evidence on impact of water quality to prescriptive activation frequency when device water source meets drinking water standards
- More clearly define "hazard" in the standard especially as it relates to the requirement for safety shower installation. Do amounts of hazardous chemicals make a difference when a shower is required?
- More clearly establish the cost-benefit of continuing with tempered water flush requirement.
- Make frequency requirements for water flow tests more wisely. Keep in mind strict water conservation mandates in drought stricken areas.
- Align ANSI/ISEA standard language more closely with California OSHA and US OSHA standard language.
- Add requirement to install drains for indoor safety showers.
- Add specific guidance on compliance with ADA regulations.
- Differentiate maintenance activities between outdoor and indoor safety shower installations.
- Make a hosed face-wash the acceptable flushing device in biomedical, biology and non-chemical research labs. No safety showers needed here.
- Counter overzealous interpretation of standards language. Some regulatory inspectors cited for not inspecting device weekly as per ANSI/ISEA Standard even when the lab was unoccupied due to holiday shut down. Allow for maintenance activities to lapse when space is unoccupied.

Discussion

The survey participants reported maintaining over 30,000 safety showers. At an estimated 2016 average installation cost of $20,000 per safety shower, these numbers represent the respondents' capital investment of at least $600 million for access to safety showers.

Some of the 2014 Standard requirements are based on scientific studies and reference documents. A 2008 document referenced[3] by the Standard was sponsored by the American Society of Plumbing Engineers Research Foundation (ASPE RF). It states in the Executive Summary:

> "Every year, in the United States alone, thousands of people are hospitalized due to chemical burns, many of which are fatal."

From 1992 to 2002 there were on average slightly over 3 occupational deaths reported in the category "Exposure to caustic, noxious, or allergenic substances - Contact with skin or other exposed tissue"[4] (all industries).

The 2014 Bureau of Labor Statistics Report[5] registered 3,750 reportable "Chemical burns and corrosions". The median days away from work were reported as 3[6].

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[3] Emergency Eyewash and Shower Equipment: A Comprehensive Literature Review and Comparison, American Society of Plumbing Engineers Research Foundation, 2008

[4] Bureau of Labor Statistics - ALL WORKERS - Fatal occupational injuries by selected characteristics: 1992-2002 http://www.bls.gov/iif/oshwc/cfoi/cftb0186.pdf

[5] Bureau of Labor News Release, Nov 2015, pg.14, accessed Oct 2016 http://www.bls.gov/news.release/pdf/osh2.pdf

[6] Bureau of Labor Statistics, Table 5: Number, incidence rate, and median days away from work for nonfatal occupational injuries and illnesses involving days away from work by injury or illness characteristics and ownership, 2014 http://www.bls.gov/news.release/osh2.t05.htm, accessed Oct 2016

Between 2005 and 2014, an annual average of 630 patients were admitted to burn centers[7] due to chemical burns. Of these hospitalizations, 270 were due to work related injuries.

The statement from the 2008 reference document does not match up with reported facts and the reference should be retracted.

The chemical incident experience in academic research and non-production laboratories is not alarming when compared to other health and safety risks. In academic institutions, chemicals of various hazard classes are used in teaching and research. Container sizes and quantities used are usually quite limited. Skin and eye exposure to small amounts of hazardous chemicals do happen. Most accidental skin exposures are washed of at a sink faucets or at an eye wash unit. Injury severity generally is limited. In academic institutions, a hospitalization as a result of hazardous chemical exposure to skin and eyes is extremely rare. Within the last ten years, the author could not find one reported case where someone working for an academic institution had died due to hazardous chemicals on skin exposure.

In academic institutions, an eye wash station in each laboratory is generally accepted as necessary and useful. There are rare instances where safety showers may also be necessary and useful. The Standard language currently does not differentiate between a hazard requiring access to an eye wash and a hazard requiring access to a safety shower. This lack of specificity bundled with unsubstantiated reference has long been a source of uncertainty and confusion. More Standard clarity to guide risk based decision making is advised.

Conclusion

Even though the Standard prescribed a weekly activation of safety showers since 1981, this requirement has not been accepted into professional practice. A large number of academic institutions are unsatisfied with this Standard language. A Standard's language change request for 2019 is attached.

Appendix

ANSI/ISEA Z358.1-2014 Standard Language Change Request for 2019

List of institutions responding to the CSHEMA survey:

Arizona State University
Colorado State
Cornell University
Creighton University
Desert Research Institute
Duke University
Erie Community College
Florida Atlantic U
Florida State University

[7] American Burn Association, National Burn Repository® 2015. Version 11.0, accessed Oct 2016 http://www.ameriburn.org/2015NBRAnnualReport.pdf

Gustavus Adolphus College
HHMI - Janelia Farm
John Hopkins U School of Med
La Jolla Institute
Michigan State University
MIT
North Dakota State
Northwestern University
Notre Dame of Maryland
Ohio State University
Rockefeller University
Stanford University
Texas Woman's University
U of Arizona
U of Buffalo
U of Calgary, Canada
U of Colorado Boulder
U of Connecticut
U of Florida
U of Georgia
UI of Illinois Champaign
U of Iowa
U of Maryland College Park
U of Michigan
U of Minnesota
U of Pittsburgh
U of Texas-Health Sciences Center Houston
U of Virginia
U of Wisconsin-Madison
UC-Berkeley
UC-Irvine
UC-San Diego
UC-San Francisco
Wash U
Whitworth University
Yale University

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