Who Must Comply with OSHA Regulations?

Everyone? No. To understand why, here’s a little history.

The Williams-Steiger Occupational Safety Act (OSH Act) became law in 1970. This act created three federal agencies: OSHA (Occupational Safety and Health Administration), NIOSH (National Institute of Safety and Health), and a Judicial Review Board.

From the start, OSHA was authorized to issue regulations and enforce them with fines and penalties. NIOSH was created to do research and make recommendations. The Judicial Review Board’s job was to help resolve disputes between OSHA and employers.

At the time of its creation, the OSH Act only applied to private sector employers. Public sector employers and federal employers were not covered.

In 1980, an executive order from President Carter extended the coverage to federal employers. State and municipal employers were still YOYO (you’re on your own).

One of the provisions of the OSH Act was to allow states to become “state plan states,” with the right to create and enforce their own regulations in their private and public sectors. To achieve this status, however, states have to submit a plan that is as strict or stricter than federal OSHA, and OSHA has to approve the plan.

The map on page three shows all the U.S. states and territories, color coded for areas that fall under only federal OSHA regulations (light blue) and areas that have their own state plan (darker blues).

Some states chose to enforce their state plan in both the public and private sectors (marked with a single asterisk). Others decided to enforce their state plan only in the public sector (marked with two asterisks).

Additionally, some state legislatures wanted to enforce the OSHA regulations in their public sector without becoming a “state plan state,” so they simply adopted OSHA regulations by reference. Those states have three asterisks.

Where we were able to identify the specific state regulation, we have cited the relevant information at the bottom of the table.

There are still 13 states where OSHA regulations do not apply to the public sector: Alabama, Arkansas, Delaware, Georgia, Idaho, Colorado, Kansas, Louisiana, Mississippi, Missouri, New Hampshire, Pennsylvania, and South Dakota.

Effective February 1, Massachusetts changed from being a non-state plan state that strongly recommended compliance to one that has adopted the OSHA regulations by reference. Now all public employers must be OSHA compliant.

To help public schools navigate the new requirements, LSI is working with the Massachusetts Science Supervisors Association, the Massachusetts Science Teachers Association, and the Massachusetts Association of School Superintendents (MASS) to help provide information and support.

LSI also created a new one-day course, How to Comply with the New MA OSHA Regulations. It is offered monthly in our Natick Conference Center and on-site on request.

For more information: Dr. James A. Kaufman, jim@labsafety.org, 508-647-1900.
LSI Updates

LSI welcomes Molly Carraway as our new Operations Assistant. We are also welcoming four new members of our Board of Directors: Tim Barton, Jaclyn Graves, Demetria Powell and Catherine Situma. We are grateful for their volunteer service.

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You are welcome to reproduce all or part of the newsletter. Please share it with your students and colleagues. We appreciate hearing how these materials are used.

Back issues may be purchased for $6.00 each. Copies of all back issues (over 75) are available and can be purchased as a complete set in three-ring binders or electronically for $300. Contact Connor Michael for more information.

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The Occupational Safety and Health Act (29 CFR 1910) provides for individual states to adopt and enforce their own regulations as long as they are at least as stringent as the federal standard and the coverage is extended to public employees. The map below indicates whether or not states have adopted such plans.

Non-state-plan states with other regulations

- Massachusetts: M.G.L. c149 §6 ½ updated March 2018 (Strongly recommended by MA Department of Safety and required for vocational schools.)
- Montana: Title 50, Chapter 71: Occupational Safety and Health
- Nebraska: Title 230, Chapter 6: Workplace Safety Consultation Program
- Oklahoma: 40 O.S. § 401, et seq. OAC 380:40 (as of January 29, 2016)
- Pennsylvania: PSF-4 REV 8-09
Awareness/Understanding of Lab Hazards

When working in a school science laboratory environment, there usually are a number of biological, chemical and physical hazards which occupants come in contact with during the work day. In order to raise awareness and understanding of improved protection and help make the science laboratory safer, employers should be communicating with employees (science teachers) and students about the hazards.

The problem is that many administrators don’t have the background or knowledge base in how to deal with biological, chemical or physical hazards. So, what can science teachers as employees do to help protect themselves and their students?

One strategy is to work with employers by helping to educate them on ways to communicate information about laboratory hazards.

Communication Strategies for Laboratory Hazards

The following is a brief list of action items which should be shared with employers in efforts to protect teachers and students in the academic science laboratory. The list is based on both legal standards and professional best practices. It serves as a starting point for improved biological, chemical and physical hazards notification/awareness, understanding, action and protection. The list includes:

A. Chemical Hazards (toxins, corrosives, flammables, and reactives):

1. Require an active inventory of all hazardous substances used in the lab and directly accessible SDS for each one.
2. Require a hazard communication program addressing use of SDSs, proper labeling, storage, use, disposal and employee training.
3. Require labeling on all containers for hazardous substances with pictograms, a signal word, hazard and precautionary statements, the product identifier, and supplier identification. Hazardous substances transferred to another container must have a limited amount of information when used more than one shift or out of the originator’s possession during the shift. This label must contain two key pieces of information: the identity of the hazardous chemical(s) in the container (e.g., chemical name) and the hazards present. It is however prudent to have this label on at all times.
4. Require employee training on hazardous substances including:
   - Explanation of SDS – what it is and how to use it
   - Employee’s “right to understand”
   - Location of biological, chemical and physical health hazards in specific work areas and protective measures to be used
   - Details of communication program, including use of labeling system, inventory system and SDSs
   - Access and review of communication program for hazardous substances

B. Biological Hazards (microbes, animals, plants, and genetically modified agents):

1. Require a written exposure control plan for occupational exposure to bloodborne pathogens and other potentially infectious materials (OPIMs).
2. Require employee training for biological hazards resulting from bloodborne pathogens including:
   - Access and review of plan
   - Explanation of epidemiology and symptoms of bloodborne diseases
   - Explanation of the modes of transmission of bloodborne pathogens
   - Explanation of appropriate methods for recognizing tasks and the other activities
that may involve exposure to blood and OPIMs

- Explanation of use and limitations of methods that will prevent or reduce exposure, including engineering controls, standard operating procedures and Personal Protective Equipment or PPE
- Information on types, proper use, location, removal, handling, decontamination and disposal of PPE
- How to select appropriate PPE
- Specific information on hepatitis B and vaccines available
- Information and protocol to follow in case of an emergency involving blood or OPIMs
- Protocol to follow for an exposure incident
- Explanation of signs, labels and color coding
- How to obtain information on types, selection, proper use, location, removal handling, decontamination and disposal of PPE
- Who to contact during an emergency
- Awareness of biological hazards in working with microbes, animals, plants, and genetically modified agents

C. Physical hazards (heating devices, noise, projectiles, fire, cold, electrical, etc.):

- Require employee training for physical hazards
- Appropriate use of personal protective equipment
- Awareness of electrical hazards – fire and shock
- Awareness of compressed gases – explosion, projectiles, flammables
- Awareness of mechanical hazards – moving machinery, projectiles, springs
- Awareness of radiation hazards – ionizing and non-ionizing radiation.
- Awareness of working with thermal hazards (heat sources).
- Appropriate machine guarding on power tools

In the End

The noted suggestion list is a start to help raise the level of awareness and understanding on the part of both the employer and the employee relative to working with biological, chemical and physical hazards in the academic laboratory. Science is to be fun – but also safer by a well-informed school administrator, science faculty and student body.

Resource:

Concerned about health and safety on the job? https://www.osha.gov/workers/


Worker Safety In Biological Laboratories – Council For Responsible Genetics: http://www.councilforresponsiblegenetics.org/pagedocuments/j118scxsur.pdf

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Editor's Notes:
1. Ken is a past member of LSI’s Board of Directors.

2. If you’ve been enjoying Ken’s series, “Safe Science—Be Protected,” you’ll be pleased to know that LSI has published a collection of articles in a single volume (100 pages, 2002, $24.95 plus s/h). A second volume of Ken’s articles is now available.

3. LSI has a wonderful publication for elementary school science safety, Safety Is Elementary: the new standard for safety in the elementary classroom (SIE).

The second edition of SIE was released in January 2010 ($29.95 plus s/h). Ken is one of the co-editors along with Peter Markow and Jim Kaufman.

To order, contact Connor Michael, Connor@LabSafety.org, or online at www.LabSafety.org.
### LABORATORY EXPLOSION AT BEIJING JIAOTONG UNIVERSITY KILLS 3 STUDENTS

BEIJING (UrduPoint News / Sputnik - 26 December, 2018) An explosion caused by a chemical experiment in a laboratory at Beijing Jiaotong University killed three students.

The explosion occurred in the eastern part of the campus where the students were conducting experiments in one of the labs.

The explosion claimed lives of three students who were conducting an experiment on wastewater.


### CHEMISTRY LAB INCIDENT SENDS 6 PEABODY HIGH SCHOOL STUDENTS TO HOSPITAL

PEABODY, MA (CBS) — Six students in Peabody were transported to local hospitals after an incident that can be traced back to a chemistry lab at Veterans Memorial High School, the Peabody fire chief confirmed.

The students reported feeling ill to the school nurse shortly after 8 a.m. Monday.

A hazmat team from the State Fire Marshal’s office responded to the school.

The State Fire Marshal believes a chemical was left in the hood of the chemistry lab over the weekend. The hood failed and students smelled an odor as they arrived at school.

Six students were transported to local hospitals after they reported feeling ill at Peabody Veterans Memorial High School (WBZ-TV)

The students were transported as a precaution and none of them showed any symptoms, the State Fire Marshall said.

According to the fire chief, there were no hazardous materials or readings found.

[https://boston.cbslocal.com/2019/01/14/peabody-veterans-memorial-high-school-chemistry-lab-6-students-transported-hazmat-response/](https://boston.cbslocal.com/2019/01/14/peabody-veterans-memorial-high-school-chemistry-lab-6-students-transported-hazmat-response/)

### Lab Ventilation Conference Announcement

Shanghai, January 8th, 2019 /PRNewswire/ --

At the beginning of the 2019, the world's most important laboratory equipment manufacturers in China, India and Europe were invited to the first “Shanghai International” lab ventilation conference.

Among the first international invited companies, Waldner (Germany), Rengulli (Switzerland), Kewaunee (USA), Hamilton (USA) are the world's leading manufacturers of exhaust cabinets, and Phoenix (USA) is the originator of the famous Venturi valve. Original companies, TEL (UK) and Trox (Germany) are representatives of advanced butterfly valve technology, and Citizen Industries is India's industry leader.

Among the invited companies from China, Tianciwan (Guangdong), Esson (Shanghai), Zhuo Si (Shanghai), and Zhongke Tongli (Shanghai) have high-end exhaust cabinets or high-end butterfly valves. Chengwei (Beijing) developed advanced low-profile wind-speed exhaust cabinets, and Leibert (Jiangsu) and Longteng (Shandong) promoted their unique air-filled exhaust cabinets.

Dr. Tang Ming said in the invitation letter:

In the past few decades, in order to achieve the goal of laboratory safety and energy conservation, many laboratory experts and equipment companies around the world have made unremitting explorations. But so far, the safety and energy efficiency of global laboratories is still very pessimistic.

(continued on page 14)
Laboratory Ventilation: The State of the Industry

By Ethan Tang

Ethan Tang is the Chief Strategy Officer for E-3 Green Technologies, which designs lab ventilation systems in China. The Laboratory Safety Institute recently requested his thoughts on the state of the ventilation industry and lab safety. We wanted to share his insights with you:

The problem with the ventilation industry right now is no innovation has surfaced in the last 40 years and we are still stuck in a global dilemma between workplace safety and energy-efficiency.

The problem is mainly two fold: 1) standards and regulations overly fixate on product standalone performance rather than viewing the laboratory ventilation system as a whole; 2) the industry has not seen any innovative solutions to properly tackle underlying root causes of the issues.

For example, fume hood technology has remained stagnant, functioning as exhaust-only devices, acting as a slave in the ventilation system that depends on room supply to properly function. Face velocity as a means to measure its performance only exacerbated the problem.

Even if you go beyond fume hoods as a standalone product, assuming they are third-party tested and contain properly as an individual component, no robust test criteria is established for how they function in a group within an entire facility’s system.

The higher level of the problem resides in ventilation dampers and control systems, or the holistic ventilation level for any critical environment. We have the single-blade/butterfly dampers prominent in Europe, and we have the Venturi valve invented by Phoenix in the late 70s for North America. Both had their merits, but both have significant shortcomings that impede laboratory sustainability and safety.

The single-blade is a very poor solution relying on pitot DP sensors that give highly inaccurate results, slow levels of response and control accuracy. There is simply no way this type of technology can properly control room pressurization, even less so for higher grade critical environments like biology labs and cleanrooms.

The Venturi valve, though it performs solidly, is grossly expensive and with a fatal shortcoming: it does not measure flow. All Venturi valves are factory calibrated and assumes a calibrated position that equates to a certain amount of airflow, but since there is no direct measurement and real-time flow monitoring based on actual flows, it poses a high level of risk as it is unable to give proper real-time feedback of actual facility operating parameters, nor can it accurately predict any potential duct leakages or clogging in the valve itself.

In sum, the aforementioned is why we decided to invest in and create E-3, and is also what our core proprietary technology rests on: a new type of containment device that has active air supply not reliant on the room system; a new type of airflow damper that delivers Venturi-level performance at a much lower price point while measuring real-time airflows; and two new categories of room control systems (one for negative pressure and one for positive pressure cleanroom environments).

The problem with our industry, or any industry for that matter, is that marketing tends to overstate benefits. I would even go as far to say in our industry, due to the lack of innovation and status quo in laboratory standards, the market has been so “brainwashed” and ingrained in the belief that what they currently have actually works well, when it is vastly sub-optimal.

The need to invest time and effort toward educating owners and markets with a proper understanding of how laboratories work beyond how they are used for their own safety and sustainability is critical, but that effort comes with an enormous time investment. It must be done, but amidst the noise and the marketing jargon and borderline “false advertising” by laboratory equipment enterprises in developing markets, the challenge is significant.
Laboratory Safety Guidelines

"Laboratory Safety Guidelines" was written while I worked for the Dow Chemical Company, in an attempt to share with schools, colleges, and universities what I was learning about lab safety. In 1976, Dow sent copies to 2,000 college and university chemistry departments and received requests for 250,000 reprints!


The Guidelines have been translated into 21 languages. In all, over six million free copies have been distributed and reprinted in various forms. The most recent new language is Braille. Our thanks to the Perkins School for the Blind for completing this translation.

In each issue of Speaking of Safety, we will publish one or two of the revised and expanded guidelines. The entire collection of revised and expanded guidelines is available in a 50-page booklet for $8.95.

#35. REQUIRE GROUNDED PLUGS ON ALL ELECTRICAL EQUIPMENT AND INSTALL GROUND FAULT INTERRUPTERS (GFI'S) WHERE APPROPRIATE.

The National Safety Council reports that about 1000 people are electrocuted each year in the United States. In 2005, a biology professor at Cleveland State University died as the result of an electrical shock in the lab.

OSHA specifies that all equipment in the workplace be grounded to avoid shock and possible electrocution. Removing or breaking off the ground pin is a bad and potentially fatal idea.

Most people are not aware of the danger associated with ungrounded equipment. This danger is compounded when the plug is a two-prong unpolarized type. If inserted backwards, the case of the appliance can be electrically hot. We find many appliances in labs that are 50 to 120 volts hot.

This same problem can be caused by two other circumstances: (1) the electrician wires the receptacle backwards or (2) the appliance manufacturer does not follow the convention. In any of these three cases, if you near a ground, serious or fatal shocks can occur.

Make sure that the ripple side of the appliance cord is connected to the wider side of the receptacle.

A ground monitor or circuit analyzer can be used to ensure that the receptacle is correctly wired. An AC sensor can tell you if the case of the appliance or device is electrically hot or not. A tension tester will indicate if the receptacle is hold on to the plug's prongs with sufficient force to meet electrical code specifications. All three tests should be performed annually on receptacles and electrical equipment in the lab.

The use of ground fault interrupters (GFI's) can provide significant shock protection. They should be installed in any location where the receptacle is within six feet of a ground or water is likely to be present on the floor or surfaces.

Circuit analyzers and AC sensors are available from THE LABORATORY SAFETY INSTITUTE. Call or email for more information.


Don't leave a booby trap for another person. Make sure that all containers are appropriately labeled. OSHA's hazard communication standard and lab standards require labeling of containers.

As the containers get smaller, this requires some practice and creativity to provide sufficient information. Color coding, signal words, and flag label can be helpful.

Develop the habit of preparing the label and then filling the container.

Remove chemical labels from empty containers before relabeling or discarding to avoid confusion about the contents.

When a new chemical is received, mark the date received, the fill level, the initials of the individual who will be the "steward" for that container, and the date opened. The steward needs to be the one who wanted to order the chemical and is now most knowledgeable about the safe use, storage and disposal of the chemical.
Volunteer Internet Marketing and Operations Assistants

LSI is looking for volunteers to assist with both Internet marketing and operations activities. Internet marketing volunteers help by identifying the names and addresses of potential email recipients and by sending email announcements. Volunteer operations assistants help produce the materials that LSI uses at its training programs. This work is performed in our Natick office.

If you have one to four hours per week available, please contact Jim@LabSafety.org or call 508-647-1900.

Subscribers/Members

We need your help. Please consider increasing your support for LSI. If you are currently a subscriber, think about becoming a member. If you are a member, consider renewing early or becoming an Organizational Member. Donations made by “Friends” are tax deductible. In-Kind gifts of equipment, supplies, and services are also appreciated. To learn more about how you can help, contact Jim Kaufman at Jim@LabSafety.org.

LSI Seeks Corporate Sponsors

The Laboratory Safety Institute is seeking corporate sponsors. Assistance is needed to provide EH&S program development services to schools, colleges, and universities; and to fund scholarships for school science teachers. LSI also offers program reviews, facilities inspections, teacher professional development, and administrator awareness seminars with the help of corporate sponsors. LSI needs your help in identifying Corporate Public Affairs and Community Affairs departments. Please call or email LSI to suggest a potential local corporate sponsor.

LSI Partners Network

Join the LSI Partners Network. Host an LSI course in your area. Volunteer to work with the Institute to offer one of our seminars or short courses for your colleagues and for others in the area.

LSI Partners help with the scheduling of facilities, audio-visual equipment, refreshments, and advertising. Contact Ana Adams (Ana@LabSafety.org), Operations Manager, for more information. See the sample seminar and short course schedules at LSI’s website (www.LabSafety.org).

ICASE Update

News from the International Council for Associations of Science Education

ICASE will hold its next (2019) triennial world conference in Thailand. For more information, visit the ICASE web site, www.icaseonline.net.

LSI is organizing a symposium on Safety in Science Education and will offer a professional development course on safety in science education.

Science educators from schools and higher education, lab technicians, lab managers, and scientists will be making presentations and discussing laboratory safety issues.

The ICASE committee on Safety in science education is being reorganized to have one representative from each ICASE region.

For more information about the ICASE-LSI symposium at the India conference or to express interest in contributing a paper please email me, jim@labsafety.org.

Bob Worley (bobworley4@gmail.com) from Great Britain is the new Chair of the ICASE Standing Committee on Science Safety.

I’ve enjoyed chairing the committee for the past seven years. I look forward to working with Bob and the committee.

To become a member of ICASE: http://icaseonline.net/
Safety incident at IISc

From: Dr. Vinod E. Madhavan, HBKU.EDU

I would like to share a very recent safety incident that happened at my previous institute, Indian Institute of Science (IISc). This incident shows how important safety is in a workplace.

The accident happened while creating a shockwave as a part of an ongoing research project. One person was dead instantaneously and 3 were critically injured. The four were employees of Super-Wave Technology Pvt Ltd (SWTPL), an IISc-incubated startup headed by senior scientists at the department of aerospace engineering, IISc.

https://bangaloremirror.indiatimes.com/bangalore/others/startup-experiment-ends-up-killing-1-on-iisc-campus/articleshow/66961209.cms

Super-Wave Technology Pvt Ltd (SWTPL)
http://www.super-wave.in/

MAKING OUR IISc INCIDENT PROBE: POLICE PROBE NEGLIGENCE ANGLE AT INDIAN INSTITUTE OF SCIENCE


A day after a 32-year-old was killed and three others injured in a suspected cylinder blast inside a laboratory of the Hypersonic and Shock Research Center in the IISc campus, forensic experts along with fire and emergency personnel continued to gather evidence from the site.

The police, in their preliminary report, have declared that it was a cylinder blast. They have taken some samples with them for further procedures. A senior police officer added that the police team questioned IISc staff to find out how exactly the blast happened and what are the standard safety measures followed during the tests.

“We are yet to confirm whether it was an act of negligence. For now, we are treating it as accidental blast,” the officer said.

A highly combustible mixture of hydrogen and oxygen was used for the process. A cylinder exploded and Manoj Kumar, who was working next to it, died on the spot. The impact was such that his body was thrown 20 feet away.

LABORATORIES SAFER


The accident is not unique. There have been many other accidents that have occurred in the laboratories of academic institutions. For example, in June 2009, flammable hydrogen gas leaked and resulted in an explosion injuring four research scholars at the University of Missouri biochemistry research lab.

The extent and the severity of the damage caused by such accidents calls for proactive safety measures to enhance safety at the academic workplace. The need is further stressed upon by the fact that academic institutions are relatively less regulated by the government in terms of following safety protocols. The proactive measures must begin from within and must start with creating extensive safety awareness among the individuals involved, by rigorously discussing the various accidents that have occurred in academia or in other related fields (to take home important safety lessons), and finally religious implementation of the same.
These questions, answers, and comments are taken from the Laboratory Safety Institute’s mail, email, phone calls, and Internet discussion list.

Robin Izzo, EHS Director at Princeton University shared this video about lessons learned. ….

My colleague at the Princeton University Plasma Physics Lab (a DOE facility) sent me this video from the Safe Conduct of Research (SCoR) at the Pacific Northwest National Lab (PNNL). There was a hydrogen fire and explosion in one of their fuel cell research labs in September 2018. This video highlights their incident investigation and lessons learned, and provides a good example of why it is necessary to continue to question and improve safety even for operations that have remained unchanged for many years with no serious incidents. This video is very well done and very much appreciated. 
https://youtu.be/K7nf0hdHVmK

*****

Photo contribution - washing up after experiments

Thank you for coming to Thailand to teach lab safety. I’d like to share with you a photo which you might find occasion to use. It wasn't taken at VISTEC, but several years ago at another place.

This is a happier example, because nobody became unwell. A student finished scaffold degradation experiments, left the samples next to the sink, and didn't return for many days. During that time, a pretty colorful fungal garden sprang up.

Regards, Timothy Quek, VISTEC

Editor’s Note: Last September, LSI spent two weeks in Thailand teaching in Bangkok, Rayong, and Chang Mai.

Timothy Quek also attached a funny picture we just had to repost here. It’s good to see that the lab safety message has also been going around social media too.
Job Opportunities in Middle East

There are openings in both Saudi Arabia and in Qatar for qualified safety professionals. I have personally worked in both countries for these institutions and can speak to the quality of these opportunities.

In Saudi Arabia, the King (KAUST) has two openings: Industrial Hygienist and Research Safety Specialist. KAUST is located on the shores of the Red Sea about an hour north of Jeddah with plenty of opportunity for international travel, sporting activities including snorkeling and diving, cutting edge research at a growing university and a unique environment within the Kingdom of Saudi Arabia. KAUST offers a competitive salary and generous benefits package including the opportunity to qualify for the Foreign Earned Income Exclusion.

To see the full details of these openings, point to: https://careers.kaust.edu.sa/, and search openings, for the following positions: Industrial Hygienist and Research Safety Specialist.

In Doha, Qatar, the Bureau Veritas has a contract with the Qatar Foundation to provide a research safety team. LSI is working with them to help identify qualified candidates.

There is one remaining opening here for a Laboratory Chemicals Safety Specialist who assists the Lab Safety Manager to accomplish activities that are related to protection of human health. They assist with monitoring and implementation of compliance strategies, policies, procedures, practices, and maintenance of licenses. They must understand safety & health requirements and how research operations relate to those regulations.

For a copy of the full job description, please write to me at jim@labsafety.org.

Free Lab Safety Webinar

LSI has offered to provide every state's science supervisor with a free webinar for his/her state's K-12 science teachers. Contact your state science supervisor http://www.csss-science.org/members/ or LSI for more information.

2019 Webinars

- Chemical Handling and Storage: May 3
- Complying with the OSHA Lab Standard: April 18
- Compressed Gases: Jul 18
- Electrical Safety: Aug 15
- Chemical Labeling and GHS: Oct 4
- How to Convince Others: Sep 19
- Lab Ventilation & Fume Hoods: Nov 14
- Leadership in Safety: May 22

All webinars and courses are available on request. Please contact Mary Thompson more information: mthompson@labsafetyinstitute.org.

LSI provides free webinars “Creating a More Effective Lab Safety Program” or “Safer Science Demos” for K-12 science teachers thru their state science department of education or state science teacher association. Please contact your local association and ask them to request these free science teacher webinars!

New Free Live and Web Q&A Sessions

This year, LSI is offering the opportunity to find out everything you wanted to know about lab safety but were afraid to ask. Free question-and-answer sessions every month are live on the Web, and most are available in-person in our Natick classroom as well.

If you come to our classroom, beverages and snacks will be provided. On the Web, sorry it’s BYO. ;-

Space is limited to the first 100 on the web and first 20 in our Natick office. Sessions held from 10:00 to 12:00 a.m. EST.

The dates are: Mar. 8, May 17, Aug. 23, Oct. 18, Dec. 13. Please let us know you are attending in person.

For more information, call Ana Adams, 508-647-1900, email ana@labsafety.org, or register online at www.labsafety.org
Many courses offered are available live as webinars. Please call if you are “Remotely Interested” in distance learning options.

For LSI’s Full Schedule visit our website: www.labsafety.org/courses-calendar

**One-day Courses**
Offered in Natick, MA (unless otherwise noted)

### Biosafety in the Laboratory
Mar 21, June 25, Sep 24

### Complying with MA’s New OSHA Regulations:
Jan 30, Feb 25, Mar 18, Apr 22, May 20, Jun 10

### Developing a More Effective Lab Safety Program:
Oct 4, Feb 14, Oct 3

### How to Be a more Effective CHO
Mar 7, May 16, Aug 22, Oct 17, Dec 12

### Lab Waste Management:
Mar 19, Jun 26, Sep 26

### Safety in the Laboratory:
Mar 20, May 1, Sep 25, Nov 13

### Safety in Secondary School Science Labs:
Apr 4, June 12, Jul 17, Aug 14, Oct 2, Dec 4

### Safety is Elementary:
Apr 3, Jun 11, Oct 1, Dec 3

The following five courses are offered on request:

- 8-Hr HAZWOPER Refresher
- Ergonomics
- Fire Safety
- Laboratory Ventilation
- Radiation Safety
- Regulatory Compliance
- Safe Labs Can Be Green Labs

### 2019 Two-day Short Courses

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<th>Location</th>
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<tbody>
<tr>
<td>Jan 8-9</td>
<td>Natick, MA</td>
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<tr>
<td>Jan 16-17</td>
<td>San Diego, CA</td>
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<td>Jan 23-24</td>
<td>Richmond, VA</td>
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<td>Feb 6-7</td>
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<td>Mar 5-6</td>
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<td>Mar 13-14</td>
<td>Calgary, AB</td>
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<td>May 1-2</td>
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<td>Dec 17-18</td>
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### 2019 24-Hour Short Course
(Tentative Dates and Locations)

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<td>Jul 23-25</td>
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<td>Aug 6-8</td>
<td>College Station, TX</td>
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<tr>
<td>Aug</td>
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### Online Courses

**Safety In the Lab Series (2018)**

- **SITL: An Introduction** (12 Topics)
- **SITL: Extended** (18 Topics)
- **SITL: Comprehensive** (23 Topics)

**How to be a More Effective Chemical Hygiene Officer** (Now Available)

LSI’s Online Courses Offers:
- Available Anytime, Anywhere
- Online Tests & Quizzes
- Certificate of Completion
- Pre-recorded videos
- Go at your own pace
- Phone and Email Support

www.labsafety.org

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**To Register or for more info:**

The Laboratory Safety Institute
192 Worcester Street
Natick, MA 01760

Phone: (508) 647-1900
Fax: (508) 647-0062
register@LabSafetyInstitute.org

Register online at: www.LabSafety.org
Subscribers/Members/Sponsors/Volunteers… Thank You!

A special thank you to the readers who have become "Friends of The Laboratory Safety Institute". Your generosity is greatly appreciated. We need your help. Please consider increasing your support for LSI. If you are currently a subscriber, think about becoming a member. Donations made by our "Friends" are tax deductible.

Corporate sponsors and partners make a big difference. They provide corporate contributions, referrals, web links, and more. Special thanks to Safety Stratus, Dow Chemical Company, Fisher Safety and the Erlab Group for their continued support of The Laboratory Safety Institute.

And, a very special thank you to our volunteers: Rebecca Fine and Sean O'Donnell. Their volunteer assistance provided invaluable support for LSI’s mission. Call to learn about volunteer opportunities. In-Kind gifts of equipment, supplies, and services are also appreciated. To learn more about how you can help, contact Jim Kaufman at Jim@LabSafety.org.

Giving Back to MA

As a non-profit ourselves, we know how much even a small donation matters. LSI donates toiletries to the Pine Street Inn, a Boston homeless shelter.

1001 Questions About Lab Safety

What every High School Science Teacher Should Know. Contribute your questions, answers and supporting resources to this important new LSI publication. Jim@labsafety.org
Get more involved. Increase your support of The Laboratory Safety Institute!

Become a member and receive a 15% discount on all products and courses:
www.labsafety.org/membership

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<tr>
<th>24-hour (3-day) Lab Safety Boot Camp</th>
<th>Two-day Lab Safety Course</th>
<th>One-day Lab Safety Course</th>
<th>1-Hour Lab Safety Webinars</th>
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<tr>
<td>Regular Price: $1250</td>
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Pricing:
- Organizational 1 Year Membership $250
- Individual 2 Year Membership $120
- Individual 1 Year Membership $75
- K-12 Teacher 1 Year Membership $25
- Student 1 Year Membership $25

Sign-up for LSI’s SOS Newsletter [FREE]
The SOS Newsletter is now FREE for everyone. Share the news with your co-workers, colleagues and friends.

Join LSI’s Mailing List [FREE]

Help our LSI’s mission
LSI is a non-profit 501(C)(3) corporation and Massachusetts Public Charity. Your donation to LSI will contribute to safety in education and education about safety. labsafetystore.org/Donate

*Rates subject to change without notice. Prices are for electronic version only.*
Are you “remotely interested” (sm) in lab safety?

Try LSI’s on-demand distance learning courses

40 Years of Safety in Science, Industry, and Science Education!

Join ICSSE: The International Committee for Safety in STEAM Education
Open to all individuals and organizations throughout the world who want to help make health, safety and the environment integral and important parts of STEAM education
Learn more: jim@labsafety.org

Everything you ever wanted to know about lab safety but were afraid to ask.

LSI now has free monthly Q&A sessions via webinar and in our Natick office.

See page 12 for more information