The Best Excuses We’ve Heard for Not Wearing PPE
and How to Respond

A few years ago, I had the opportunity to teach at the National Autonomous University of Mexico (UNAM). It’s one of the largest in the world with 350,000 students.

We toured some of their labs. In one of the labs there was a cartoon on the wall showing three dead scientists. You could tell they were scientists because they were wearing lab coats. You could tell they were dead because they all had halos, wings, and were sitting on clouds.

One said: “That never happened before.” The second said: “It will never happen here.” The third added: “It can’t happen to me.”

Underneath them, the caption read: “Excuses don’t prevent accidents.”

It can be very interesting to hear the wide variety of excuses that people offer for not wearing their personal protective equipment (PPE). Recently, LSI asked several online discussion lists for their favorites.

Some are ridiculous. Others may signal a legitimate need for proper fitting / use modification. A few examples:

**GENERAL EXCUSES**
- It takes too long and I’m just in here for a minute.
- The activity I’m doing isn’t hazardous.
- These clothes / shoes are the only kind I have.
- There are no hazardous activities in the lab.
- I have a right to wear / not to wear this.
- Nothing has ever happened before.

**EYE PROTECTION**
- My eyewear fogs up.
- I have a face shield on. Why would I need safety glasses?
- I’m wearing safety glasses. Why do I need splash goggles?
- I’m working behind a sash. Why do I need to wear anything?
- These safety glasses keep slipping off my face.
- They hurt my ears.
- They give me an awful headache.
- Sunglasses will protect my eyes from lasers.
- If something flies, I’ll just put my hand in front of my eyes.

We compiled a list of the best excuses we could find and then created a “cheat sheet” with some suggested responses to those excuses. You can get it from our website here.
**Speaking of Safety** is published by the Laboratory Safety Institute (LSI). It is written and edited by James A. Kaufman and Connor Michael.

Electronic subscriptions (three, 16-page issues) are free. Inquire about printed copy subscriptions. Multi-year and bulk subscriptions are also available.

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.

Some of the back issues are now available online for free. We are working on adding more. Copies of all back issues (over 90) are available and can be purchased as a complete set in three-ring binders or electronically. Contact connor@labsafety.org for more information.

**The Laboratory Safety Institute**
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**Volunteers**
Would you like to help LSI? Become a volunteer!

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**LSI Updates**

LSI now has virtual lab inspections, safety program evaluations, document reviews, plus courses and seminars ... all virtual.

Ali Schreck is the newest member of the LSI team. While she completes her master’s at Assumption University, she is working with me as an operations assistant and helping LSI with marketing and outreach.

We have a new volunteer membership committee to help recruit and retain LSI members. Ali is the coordinator.

Jim Kaufman

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Read This Before Re-Opening
The Hidden Hazards of Closed Buildings

This year, if all goes as hoped, the doors will be swinging open on millions of buildings that have been shuttered for months as the world emerges from the pandemic. But waking a building from hibernation is not always as simple as cranking up the furnace and flicking on the lights. Dormancy leads to specific safety issues that have taken many organizations by surprise.

Take what happened last June in northwestern India. According to *Times of India*, Sardar Patel University had been locked down for two months when Ami Patel, a Ph.D. student, opened up the bioscience laboratory.

Patel could sense heat after opening the doors, but she ignored it, assuming it to be trapped heat inside the locked-up rooms. When she turned on the lights, she saw an electric spark and a fire and ran for help. Although there was no loss of life or injuries, property damage is estimated to be at least $1.3 million. The entire facility was gutted.

While a building sits empty, much is happening inside. Peroxides are forming, metal is rusting, and valves and other building hardware is silently deteriorating without anyone around to notice. According to the National Fire Protection Association, about 3% of all fires occur unintentionally in unoccupied buildings.

Lockdowns also lead to mold and bacteria issues. Last year, Legionnaire’s disease from stagnant water was actually more prevalent than COVID-19 in some localities. Acanthamoeba, which can cause blindness, may be present in eyewash fountains and safety showers.

The Laboratory Safety Institute recommends that labs undergo a thorough inspection before re-opening. It is critical that biosafety cabinets and fume hood certifications are up-to-date, emergency response equipment is tested, and all hazardous materials (especially peroxide-forming chemicals) are inspected. (And now for the shameless plug: please call LSI for a virtual lab inspection or to schedule a consultation: 508-647-1900.)

Photo: *Times of India*. A fire broke out in June at Sardar Patel University after a bioscience lab had been locked down since March.
Dealing With Hazardous Waste in a Safer Way

I. REGULATING HAZARDOUS LABORATORY CHEMICAL WASTE
According to the Environmental Protection Agency (EPA), a waste is determined to be hazardous if it is specifically noted on one of four lists (the F, K, P and U lists) found in title 40 of the Code of Federal Regulations (CFR) in section 261. The F-list, found at 40 CFR section 261.31, identifies wastes from common manufacturing and industrial processes as hazardous. A few examples include spent solvent wastes and electroplating and other metal finishing wastes.

The K-list identifies hazardous wastes from specific sectors of industry and manufacturing and, are considered source-specific wastes. There are 13 categories like wood preservation and organic chemicals manufacturing. The P and U lists designate as hazardous waste pure and commercial grade formulations of certain unused chemicals that are being disposed.

Hazardous waste has characteristics or properties that indicate the waste poses a sufficient threat to merit regulation as hazardous. The EPA established four hazardous waste characteristics: ignitability, corrosivity, reactivity and toxicity.

Ignitability:
Wastes that are hazardous due to the ignitability characteristic include liquids with flash points below 60°C, non-liquids that cause fire through specific conditions, ignitable compressed gases and oxidizers. EPA assigned D001 as the waste code for ignitable hazardous wastes.

Corrosivity:
Wastes that are hazardous due to the corrosivity characteristic include aqueous wastes with a pH of less than or equal to 2, a pH greater than or equal to 12.5 or based on the liquid’s ability to corrode steel. EPA assigned D002 as the waste code for corrosive hazardous wastes.

Reactivity:
Wastes that are hazardous due to the reactivity characteristic may be unstable under normal conditions, may react with water, may give off toxic gases and may be capable of detonation or explosion under normal conditions or when heated. EPA assigned D003 as the waste code for reactive hazardous wastes.

Toxicity:
Wastes that are hazardous due to the toxicity characteristic are harmful when ingested or absorbed. Toxic wastes present a concern as they may be able to leach from waste and pollute groundwater. The toxicity of a waste is determined by the Toxicity Characteristic Leaching Procedure (TCLP) (SW-846 Test Method 1311). EPA assigned wastes codes D004
through D043 that correspond to a contaminant and its associated TCLP concentration.

**Mixed Radiological and Hazardous Waste:**
Mixed wastes are hazardous wastes which also contain radioactive material. Mixed waste is regulated under the RCRA and the Atomic Energy Act. The hazardous component of the mixed waste is regulated by EPA under RCRA. The radiological component of the mixed waste is regulated by the Department of Energy (DOE) or the Nuclear Regulatory Commission (NRC). The NRC typically regulates waste from commercial and non-DOE facilities while the DOE regulates waste from DOE facilities. ([Source and Additional information](#))

In addition to chemical hazardous waste, nuclear waste itself is regulated. Nuclear waste management is directed by the Nuclear Regulatory Commission under 10 CFR 20 Subpart K. This deals with the disposal of radioactive isotopes.

The Occupational Safety and Health Administration (OSHA) primarily deals with labeling and storage of hazardous waste. The Hazard Communications Standard and Bloodborne Pathogens Standard apply in these cases.

Shipping of hazardous waste is the responsibility of both the Department of Transportation (DOT) and EPA. Standards for labeling, signage, etc. are addressed.

In addition to federal regulations on waste, state and local regulations exist and should be investigated for applications to school science laboratories.

Given all of these hazardous waste regulations, schools have responsibility in taking care of hazardous waste produced in their science laboratories and may have legal responsibilities from governmental agencies.

**II. DOES YOUR SCHOOL CONTAIN HAZARDOUS WASTE?**
The first thing to do is to determine if and where hazardous waste is being generated. Usually chemistry laboratories are prime candidates by the nature of the discipline, though other labs may also be producing waste. More recently, middle school life science and high school biology laboratories have the potential to produce biological or medical waste as the result of biology, biotechnology and microbiology course work. Other areas for hazardous waste production may include art rooms, technology education/engineering labs, STEM labs and maintenance shops/custodial closets.

The second thing to determine is whether the waste being produced is hazardous or nonhazardous. This determination will dictate how to handle the waste. All waste chemical solids, liquids, or containerized gases should be treated as hazardous waste unless they have been confirmed to be a non-hazardous waste. Remember that a laboratory chemical is “waste” when you no longer plan to use it. Also remember that spilled chemicals and materials used to clean them up are hazardous waste. In addition to stock chemicals, items containing chemicals are also to be considered, e.g., paints, solvents, glues, disinfectants, etc. A generator can make the determination based on information supplied by the manufacturer, having the waste tested or having the chemical listed in the Resource, Conservation and Recovery Act (RCRA). ([Part 261](#))

The final thing to determine is how to manage the waste appropriately. Depending on the type of waste will dictate if it is subjected to regulatory statute. (To be continued in the next issue)

**LIVE LONG AND PROSPER SAFELY!**

**Author:**
Dr. Ken Roy, director of environmental health and safety at Glastonbury (CT) Public Schools, NSTA & NSELA safety compliance consultant. Email: Royk@glastonburyus.org

More 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 entitled, *Safety Is Elementary: The New Standard for Safety in the Elementary Classroom.* ($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.
Speaking of Safety

SAFETY WISDOM
Accidents are not due to lack of knowledge, but failure to use the knowledge we have.

Organisations have no memory.
Only people have memory and they move on.
—British Safety Expert Trevor Kletz (1922-2013)

Industrial Safety:
Lessons Learned Database

Inspired by the above fundamental insights from the late Trevor Kletz, the UK-based nonprofit safety organization known as IChemE has developed the Lessons Learned Database, a comprehensive online catalog of industrial safety incidents with in-depth expert analysis. Its purpose is to “raise awareness of major incidents in the process industries, to promote the importance of root-cause analysis and to catalyze cross-sector sharing of lessons learned and good practices.” The Laboratory Safety Institute highly recommends this resource for teaching, hazard analysis studies, and anytime meaningful data is needed to justify projects that improve process safety.

**Major Incident Summaries:**
- Oil and Gas (Upstream)
- Oil and Gas (Midstream)
- Oil and Gas (Downstream)
- Oil and Gas (Transportation)
- Oil and Gas (Terminals)
- Petrochemicals
- Agrochemicals
- Pharmaceuticals
- Power Generation (Nuclear)
- Power Generation (Coal-Fired)
- Power Generation (Biomass-Fired)
- Water Treatment
- Food and Drink
- Pulp and Paper

One Killed, Two Injured in Explosion of Guacamole Maker at New York Lab

One person was killed and two injured following an explosion August 5 at a mechanical engineering and testing laboratory in Schenectady, New York.

Joseph Kapp, a longtime member of the Hudson Valley Community College Board of Trustees and former Rensselaer mayor, was killed after a tank being tested to make guacamole exploded at Innovative Test Solutions.

Scott Briody, vice president and owner of the lab, attributed the death to the “catastrophic failure” of a high-pressure food processor during operational testing. Arriving firefighters found no hazardous materials. Nothing was in the machine at the time.

The Occupational Safety and Health Administration has launched an inspection of Innovative Test Systems.—The Daily Gazette
Take-Home Contamination
By Howard Spencer

Workers can carry hazardous substances home from work on their clothes, bodies, tools, and other items. A USA TODAY investigation found that employees in more than 35 states have unwittingly transported toxins away from work sites — potentially exposing many family members to contaminants such as mercury, radioactive material, beryllium, lead, and asbestos, PCBs, pesticides and arsenic.

Although most family members never develop medical problems or come into contact with the contaminants, others have died or now cope with lifelong health problems and fatal illnesses. Children often are in the most danger because of their developing organs and higher metabolic rates. The means by which hazardous substances have reached workers’ homes and families include:

On work clothing - Cases involve beryllium, lead, pesticides, and other chemicals. In some cases washing machines and dryers contained dangerous levels of the materials, poisoning those laundering work clothes and contaminating other laundry.

On tools and equipment - Substances brought home on hand tools and other equipment have contaminated homes and vehicles. Cases involved mercury, pesticides, PCBs, and radioactive material.

Taking items home from work - Items such as bags, rags, metal drums, and scrap lumber have caused serious and fatal poisonings of family members.

On the worker’s body - Reports document that workers passed dangerous materials to their family by their hands and hair.

Toxins transported off-site often are too small to be noticed, so relatives may never know they’ve been put at risk. They may be exposed if they touch a contaminated worker, handle his clothing or clean a house that contains hazards tracked in from the job. Hazards can get into the home when workers or employers fail to follow or provide proper safety protocols, such as showers or protective clothing.

Preventing take home toxins
• Use good safety practices to reduce exposure, wear all required PPE
• Leave soiled clothes at work, best if employer arranges for laundering
• Change clothes before leaving work
• Store non-work clothes away from work clothes, in a separate locker when possible
• Shower before leaving work, at least wash hands arms and face
• Do not take tools, scrap, packaging, and similar items home
• Inform workers of potential workplace toxins
• Launder work clothes separately if they must be home laundered
• Prevent family members from visiting hazardous material work areas

About the Author:
Howard Spencer is a Senior Safety Consultant at Connor Strong. He is active with the American Association of Safety Professionals (ASSP). He has written dozens of articles in his series “Howard Talks Tech.” He has worked with LSI to inspect pharmaceutical research and consumer product testing labs. Contact Howard at safetyguy328@aol.com.
Laboratory Safety Guideline #5: Involve Every Staff Member in the Safety Program

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.

Since then, Dow (1986), Fisher Science Education (1989), Carolina Biological Supply Company (1994), Fisher Safety (2012), Workrite (2017), SCAT-Europe (2019) have produced co-branded editions of the guidelines in various poster formats. The guidelines have been translated into 21 languages, and it’s even available in Braille!

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 on our website.

You really need to find ways to get people involved. Students are people too, so don’t forget them.

There’s a tendency to think that if someone is appointed safety coordinator, they have to do all the work for the rest of us. False! A coordinator is just that. He or she is not a “parent.” Each person needs to be responsible for safety in general and for a specific part of the program in particular. Here’s a list of a number of different specific assignments:

- Lecture bottle gas cylinders
- Chemical inventory
- Highly toxic compounds
- Heavy metals
- Emergency response
- Pyrophorics
- Reference materials
- Oxidizers
- Alcohol inventory
- Acids and bases
- Fire equipment
- Refrigerators
- Flammables storage
- Showers and eye washes
- Specimen storage
- Electrical hazards
- Accident records
- In-service training

Get the idea? Everyone has a job to do. Everyone participates. Take turns doing a monthly lab inspection. Take turns presenting a 5-10 minute safety topic at department meetings. Take turns telling the principal/superintendent about needed repairs (with the department head’s permission)!

Who is going to be responsible for the department’s laboratory health and safety bulletin board? How about the “safety drawer” in each lab? Who makes sure that the drawer is properly stocked?

Want to review your emergency procedures? There are more than a dozen common types of lab emergencies. Why not have a different employee/student conduct the review at the monthly staff meeting?

Who does your chemical hygiene plan review? The CHO, the safety committee? Give it up! Give it to three, four, five members (students) of your department and treat them to the CHP review luncheon. Don’t forget to give your boss or your boss’ boss the leadership opportunity to send the reviewers a thank-you note.

The best safety programs are the ones that get everyone most involved. How do you get people involved? Let’s hear about what you’re doing!

1001 Questions About Lab Safety
Got a question? Contribute your questions, answers and supporting resources to this important new LSI publication. Jim@labsafety.org
Webinars Free for K-12 Teachers

Teaching isn’t easy, especially during a pandemic. 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. Contact your state science supervisor at www.csss-science.org/members/ or LSI for more information.

2020-21 Webinars

Chemical Handling & Storage: Jan 29, Sep 10
Complying with the OSHA Lab Standard: Apr 23
Compressed Gases: June 19, June 18
Electrical Safety: Aug 27

Eye and Face Protection: Dec 17
Chemical Labeling and GHS: Oct 22
How to Convince Others: Jul 23
Lab Ventilation & Fume Hoods: Nov 12
Leadership in Safety: Mar 26
Legal Aspects of Safety: Feb 12

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

New 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. Question and answer sessions every month are live on the Web. Sessions held from 10:00 to 12:00 a.m. EST. Registration fee is only $10.

The dates are: Jan 8, Mar 12, May 21, Jul 9, Oct 8, Dec 3. Sessions will not be held in Natick until further notice due to COVID restrictions! For more information, contact Ana Adams at 508-647-1900 or ana@labsafety.org.

ICASE Triennial World Conference

The International Council of Associations for Science Education (ICASE) will hold its next triennial world conference in 2022. For more information, visit the ICASE web site, www.icaseonline.net.

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

LSI is organizing a symposium on safety in science education and will offer a professional development course on safety in science education. We are looking for sponsors to make it free for science/STEM teachers.

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

Candidates are now being sought for the position of president elect.

Join ICSSE (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
Lab Safety Courses When You Want, Where You Want

More than 100,000 people in 30 countries have attended our live courses. Now you can get the same industry-tested lab safety education at a time and place convenient for you. Watch videos, ask questions, and receive graded quizzes and feedback from a real instructor.

**Member Pricing:** Become a member and receive a 15% discount.

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**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 also want to acknowledge the corporate contributions of Safety Stratus, Dow Chemical Company, Fisher Safety and the Erlab Group for their continued support of The Laboratory Safety Institute.

With the recent economic downturn, we truly depend on your support for our future survival. To learn more about how you can help, contact Jim Kaufman at Jim@LabSafety.org.

**Lab Tech Dies of Mad Cow Disease Nine Years After Incident**

In May 2010, a 24-year-old lab technician at the National Agronomic Research Institute lab in Versailles, France, accidentally stabbed her thumb through a double pair of latex gloves while working with mice brain tissue containing variant Creutzfeldt-Jakob (mad cow disease) proteins. Symptoms did not appear until seven years after the incident, and she passed away two years after that. In 2020, The New England Journal of Medicine acknowledged her death was likely the result of the lab incident.

“Such cases highlight the need for improvements in the prevention of transmission of vCJD,” the report authors concluded. The report does not say what safety measures were taken at the woman’s lab, or how she was treated after her exposure. However, in July 2019, the French press reported that the family of the technician had filed a manslaughter complaint alleging that the woman had not been trained in risk, was not wearing adequate safety equipment and had no medical follow-up. In particular, the woman should have been wearing cut-resistant gloves rather than latex gloves, and the woman did not undergo decontamination procedures for about 20 minutes after being injured.
Smoke! Fire! Explosions!!!
What’s Wrong With “Wow” Chemistry Demonstrations

I agree that both demos and videos should be used in education. With over 50 years of demonstration experience in many different venues and in over 30 different countries, I have maintained a safety record where no one has ever been injured and no facilities were damaged other than broken glassware. That doesn’t mean things don’t go wrong, but when they do, everything is under control and everyone is safe.

While there were programs that taught chemical demonstrations in the mid-1980s to the mid-1990s, they were all discontinued for lack of funding. Today, there are too many “wow” demonstrations on YouTube videos and TV shows and, in my opinion, too many untrained individuals who are trying to reproduce them.

A good demonstration should have educational value and not be another exhibition of fire, smoke and explosions. The demonstrator must know what he/she is working with, the proper PPE, the proper size for the demo, and the proper venue for that demo.

I have stated that I can teach more by burning almost pure hydrogen in a test tube than by exploding a hydrogen filled balloon. This year, I updated my website to include some information on safety with chemical demonstrations.

—David A. Katz, Chemist, Educator, Expert Demonstrator

When SDSs Contradict Each Other

I have a question as I put together the guidelines for our PHSs. I have found that not all SDSs categorize the hazards of a chemical the same.

Where one company might put the carcinogenicity of lets say potassium bromate at a 1A another company will have it at 2. In some cases we have the same chemical but from 2 companies.

My gut is to go with the more severe categorizing of the hazards involved and set up the PHS accordingly. I was wondering if you could shed some light on this.

—Pamela Grindle, Laboratory Manager
Ocean Studies Department, Maine Maritime Academy

Jim Kaufman Replied:

Hi Pam, I’m with you. Go with the more conservative. You could always get a third opinion.

When I was in high school and enjoying American history, our text was by Henry Steele Commager of Amherst College. It said that John Brown was shot. I looked in a second history book and it said he was hanged. By the time I had reached the seventh book, the score was 4-3, shot to hanged.

So I wrote to Dr. Commager about my mini-research project. He wrote back: “I’d better look into this!”

Responsible folks don’t always agree. One doctor says operate, the second says try toxic drugs, and the third says let’s wait.

Ronald Reagan said, “trust but verify.”

Bottom line— it’s not an exact science. Be conservative.

Ronald Reagan: “Trust but verify”
Classes are 8:30 a.m. to 4:30 p.m. each day. Dates and locations are subject to change or cancellation. Before making final arrangements, contact LSI to confirm.

## ONLINE COURSES
(Anytime, Anywhere)
- Includes online tests and completion certificate
- **How To Be a More Effective CHO**
  - Early Bird: $600
  - Individual: $500
  - Group of 24: $475
  - K-12 Teacher/Grad Student: $350
- **Introduction (12 topics)**
  - Individual: $295
  - Group of 5-9: $285
- **Extended (18 topics)**
  - Individual: $395
  - Group of 5-9: $375
- **Comprehensive (23 topics)**
  - Individual: $495
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## ONE DAY COURSES
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### Biosafety in the Laboratory
- Feb. 18, Oct. 26

### Complying with MA’s New OSHA Regulations
- Jan. 21, Mar. 16, May 4, Sep. 28, Oct. 28, Nov. 30

### Developing a More Effective Lab Safety Program

### How To Be a More Effective CHO
- Jan. 20, Mar. 17, May 5, Sep. 29, Nov. 11

### Safety in the Laboratory
- Jan. 19, Feb. 16, Mar. 18, Apr. 22, May 6, Jun. 1, Sept. 30, Nov. 9, Dec. 2

### Safety in Secondary Schools Science Labs
- Apr. 21, Nov. 10

### Safety is Elementary

## ONE HOUR WEBINARS
- $99 per connection. No limit on attendees. $10 for each certificate of attendance. 1:00 p.m. Eastern.

### Chemical Handling and Storage
- Jan. 29

### Legal Aspects of Safety
- Feb. 12

### Leadership in Safety
- Mar. 26

### Complying with OSHA Lab Standard
- Apr. 23

### Chemical Handling and Storage
- May 7

### Compressed Gases
- Jun. 18

### How to Convince Others
- Jul. 23

### Electrical Safety
- Aug. 27

### Chemical Handling & Storage
- Sept. 10

### Chemical Labeling & GHS
- Oct. 22

### Lab Ventilation & Fume Hoods
- Nov. 12

### Eye & Face Protection
- Dec. 17

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