



UC SAFETY SUITE

UC Safety is a suite of applications designed to assist Environmental Health and Safety staff and university researchers in managing different aspects of work done in facilities, while helping to meet state and federal regulations. These applications have in common much of the same information including people, locations and chemicals.

[Explore the suite](#)

POSTER OF THE MONTH



Lab Ergonomics
Safety Evaluation

Chemical and Biological Safety: Engineering Controls and Respiratory Protection

By: James Dunbarr, CIH, UC Davis

There are many key factors that one needs to take into account when working safely in a laboratory. Many of these are directly related to the actual work itself; for example, knowing the hazards of the materials that we work with, compatibility of materials, storage, hazard communication to those working around us, etc...just to name a few.

At times, even if we are working as carefully as possible, we still need to rely on additional safety features that offer us enhanced protection while completing our tasks. The first line of defense that we always look toward in working safely with a hazardous material are "engineered ventilation controls". Essentially, this is any type of ventilation control that is going to be suitable enough to remove or minimize the hazards of the material(s) that we are working around. Engineered ventilation controls can be found in laboratories in various styles including (but not limited) to the following:

- Chemical Fume hoods
- Walk in / Floor mounted Fume Hood
- Biological Safety Cabinets
- Downdraft Tables
- Snorkel Tubes / Elephant Trunks
- Glove Boxes

The type of appropriate engineered control will be dictated by the scope of work being conducted. At times, it is appropriate to have the entire process enclosed within a hood, while other times it may be adequate to have a 'point source' control (like a snorkel tube), depending on the work.

The bottom line is that if work is being conducted in a laboratory and hazards exist that warrant engineered ventilation controls, effort should be made to ensure that the work related to this process is taking place within the effective capture zone of the engineered control. Most of the time, engineered ventilation controls take care of the hazard entirely, however there may be times when an engineered control is not available, out of commission or simply not effective enough. In these cases, one may need to wear a respirator as additional PPE (personal protective equipment) to whatever other PPE is required in the space. One of the following types of respirators may need to be worn in order to conduct the work safely, depending on the type of work going on:

- N-95
- ½ face, air purifying respirator
- Full face, air purifying respirator
- Powered Air Purifying Respirator (PAPR)
- Self Contained Breathing Apparatus (SCBA)

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Lockout / Tagout for Laboratories

By: Mark Martin CSP, UC Davis EH&S

When you hear the term “Cal OSHA General Industry Standard”, a university laboratory may not be the first image that comes to mind. One would naturally think of an automobile assembly plant, a machine shop, a textile mill, or some other traditional “general industry” workplace, but not a lab.

Laboratories are indeed a general industry workplace and, like the other industries mentioned above, are becoming more and more automated. Analytical instrumentation and their associated auto samplers, sample prep systems, power supplies and even glassware washers are more sophisticated than ones from even ten years ago.

California Code of Regulations Title 8 § 3314 spells out the requirements for “The Control of Hazardous Energy for the Cleaning, Repairing, Servicing, Setting-Up, and Adjusting Operations of Prime Movers, Machinery and Equipment, including Lockout/Tagout” (commonly known as LOTO). Under this standard, any piece of laboratory equipment that undergoes cleaning, repairing, servicing, setting-up and adjusting and has the potential of unexpected startup or re-energization, must be completely de-energized before work activities on the equipment can begin. Let’s look at the key elements of a LOTO program.

CHEMICAL & BIOLOGICAL SAFETY: ENGINEERING CONTROLS AND RESPIRATORY PROTECTION

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When wearing a respirator that is required on the job, it is important to work closely with the representative at your site in order to understand the process of properly obtaining a respirator. Before a respirator can be obtained, one needs to be medically cleared and have training on using the respirator unit before wearing it for the job.

If you’re unsure about the best way to handle existing hazards in the work place, whether it be engineered ventilation or using a respirator, contact someone from your safety department to conduct a hazard assessment, which will help you gain a better understanding of what you may need for additional protection.

Training

- Employees performing the work on the equipment must be trained and must fully understand all of the hazards associated with the particular maintenance task being performed. They must also know how to isolate hazardous energy and apply lockout devices. Once trained, this person becomes an Authorized Employee by Cal OSHA definition.

Energy sources

- All forms of energy used or produced by the equipment must be controlled and isolated from the Authorized Employee performing the work. This includes electrical, pneumatic, hydraulic, kinetic, potential, thermal and electromagnetic.

Simple Lockout

- If a piece of equipment is powered by a single utility source and can be completely de-energized by unplugging it from a utility source with no residual energy stored on the equipment, and the operator has exclusive control over the plug, then a written Hazardous Energy Control Procedure (HECP) is not required. The simple lockout criteria is hard to meet these days. Most modern electronic devices utilize many capacitors that can store a considerable amount of electrical energy after being powered off. If the equipment stores energy, you cannot meet the simple lockout definition. Consult the equipment manufacturer if you are unsure.

Complex Lockout

- If the equipment is powered or inherently by function has more than one source of energy, then a written and verified HECP must be developed for each type of equipment. For example, consider a gas chromatograph equipped with an autosampler and a flame ionization detector. Isolation points are needed for electrical, Hydrogen carrier gas and possibly separate electrical for the autosampler; each isolation point would require a lockable lockout device and a tag. The thermal energy from the GC oven would require a protective heat blanket or a cool down period verified by an IR thermometer. Each step of this process must be stated in sequence on the HECP. Each lock must have a single unique key that is kept in the possession of the Authorized Employee at all times. UC has a UC LOTO mobile app for developing HECPs quickly in your lab that also double as your lab’s SOP for managing energy hazards on your equipment.

If you require more information, contact your campus’ EH&S Department and the equipment manufacturer. For information about using the UC LOTO app, contact Jim Gilson, Senior Safety Engineer, UCOP at 510-643-9575, or your local campus EH&S Dept.



CONNECT

Know where to turn on your UC campus for the information you need to keep yourself, your workplace and your environment safe and secure. Click on the campus links below to connect to local program, educational and informational resources.

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Risk Summit 2015 - Spotlight & Peer Award Winners

Our risk mitigation programs have continued to evolve since the first Risk Summit in 2005. Our awards programs have also grown to recognize the achievements of our risk and safety professionals for exceptional projects and programs with long-term strategies.

As part of promoting our strategic objective of mitigating and managing risk to protect the university's resources, the Chief Risk Officer has established the Spotlight Awards for those programs which contribute to advancing our core mission.

Nominations for the Spotlight Awards can be made throughout the year with presentation annually at the Risk Summit Conference.

Program	Award	Project	Campus
Environmental Health & Safety	Collaboration	Rapid Building Assessment Team	Irvine
Environmental Health & Safety	Innovation	Created first-ever mobile Student Emergency Plan	Berkeley
General Liability	Collaboration	Implemented UCSF Clinical Research Risk Management Program (CRRM)	San Francisco
Professional Liability	Innovation	Implemented Post Event Recovery Communication (PERC) program	Los Angeles Health
Workers Compensation	Collaboration	Managed Occupational Health Surveillance system for many smaller campuses	Davis
Workers Compensation	Innovation	Reformed the UCR Dining Services Safety Committee to promote ownership	Riverside

Peer Awards:

Excellence in Emergency Management – Davis
President's award for EH&S – Santa Cruz
Presidential award – San Diego Health System

For more information about the Spotlight Awards, visit <http://www.ucop.edu/risk-services/reports-resources/recognition-program/spotlight-awards.html>

LAB SAFETY RESOURCES

[Personal Protective Equipment \(PPE\) Policy](#)

[Minors in Laboratories and Shops Policy](#)

[Laboratory Safety Training](#)

[UC Center for Laboratory Safety](#)

[Downloadable version of the NOISH Pocket Guide to Chemical Hazards](#)

[UC San Diego Laboratory Safety Videos](#)

[UC Safety Suite of Applications](#)

UPCOMING EDITIONS

October: Fire Prevention

November: Shop & Tool Safety

December: Family Safety & Security

FEEDBACK, PLEASE

Send an email to EHS@ucop.edu to submit your comments on the August issue or to suggest content ideas for future issues. We look forward to hearing from you!