ENVIRONMENTAL HEALTH AND SAFETY

Lab Chatter

UNIVERSITY OF NEW ENGLAND

INNOVATION FOR A HEALTHIER PLANET

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Safety Spotlight

UNE Lab Safety Sub-Committee Meetings

The UNE Lab Safety Sub-Committee is a small group of EHS staff, lab staff, and Chemical Hygiene Officers (CHOs) that meet once a month to discuss lab safety issues in UNE laboratories. This group is comprised of a sub-set of individuals pulled from our University-Wide Safety Committee (UWSC). The group focuses on all sorts of lab safety issues and hopes to make the lab community more aware of safety initiatives and report to the group any issues that need to be addressed. Some of these issues will be reported to the UWSC as needed. Any individual interested in attending these meetings on a regular or occasional basis is welcome to join us. **We meet the 4th Tuesday of every month at 11:30 am in the Ross Conference Room in Stella Maris Hall on the Biddeford campus and tele-conference to Hersey 204 on the Portland campus.**

2017/2018 Remaining Dates: Nov 28, (No Dec), Jan 23, Feb 27, Mar 27, Apr 24, May 22

Industrial and Academic Laboratory Safety Practices — Narrowing the Gap

There is a widening gulf between how safety is practiced in industry compared to how it is practiced in research laboratories, especially in academic settings.

Article by Vince McLeod | June 04, 2015; Source: Lab Manager Magazine

A rash of serious incidents has brought the reality of this gulf to light in a tragic way. Issues span a variety of gaps, including organizational buy-in and accountability, oversight of safety programs, and weak or incomplete hazard evaluations. This article will take an in-depth look into these and other issues and discuss how you can avoid potentially serious shortfalls in your lab safety programs.

An unexplained upsurge of research laboratory accidents during the past few years has spotlighted a dangerous phenomenon: a seeming lack of adequate safety programs in these settings, particularly in nonindustrial research laboratories. In brief, we have had fatal fires (UCLA researcher Sheri Sangji), serious explosions (Texas Tech), and horrific deadly accidents (Yale Physics Lab Shop). Why is this? Why are we lacking a strong safety culture in these settings? What do we do to improve it? Are there better ways to instill a culture of safety where it is missing?

The huge disparity between safety cultures and practices in industrial versus nonindustrial settings is indisputable. In a recent letter published in Chemical & Engineering News, the chief technology officer at Dow Chemical, the senior vice president of Corning Global Research, and the vice president of Dupont's Global Research and Development, all members of the American Chemical Society's Presidential Commission on Graduate Education in the Chemical Sciences, had this to say about the wide gulf in safety cultures:

"The facts are unequivocal. Occupational Safety & Health Administration statistics demonstrate that researchers are 11 times more likely to get hurt in an academic lab than in an industrial lab. There have been serious accidents in academic labs in recent years—including fatalities—that could have been prevented with the proper use of protective equipment and safer laboratory procedures."

We have to agree wholeheartedly with that last statement. All incidents and injuries can be prevented, even when performing cutting-edge research. The questions are: How much prevention is the right amount and what do those preventive measures look like?

Recent groundbreaking work

A great place to start is the Chemical Safety Board's report on the Texas Tech explosion. The CSB case report found systemic deficiencies that contributed to that incident, including a lack of safety management accountability and oversight; poor assessment of all hazards, particularly the physical hazards; and a lack of documentation, investigation, and communication of previous incidents.

In another significant report last year, the National Research Council, an independent, nonprofit organization of experts dedicated to improving government decision- making and public policy in all matters of science, engineering, technology, and health, published a treatise on the subject titled "Safe Science." The goal of their report is to promote a better safety culture in nonindustrial research laboratories. Their suggested approach begins by looking at methodologies used in industries such as airlines, healthcare, and manufacturing/production.

We will take a closer look at those two breakthrough publications, but to be fair, when we start to think about how to close the gaps and build a better culture of safety in these nonindustrial research laboratories, we must keep in mind the unique and dynamic nature of the settings. There typically are large flows of new and inexperienced researchers through these labs, resulting in high turnover and a wide range of experience from young researchers just beginning work to seasoned laboratory veterans, something not seen in your average industrial laboratory setting. This same problem is also

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encountered by the changing of principal investigators and scientists as researchers visit from other institutions and some pursue the quest for tenure. All this turnover and varying lengths of stay impact training and make maintaining a strong safety culture a challenge. And finally, the most sacred expectancy of all, well-known leading researchers expect a high degree of autonomy and little, if any, infringement on their intellectual and academic freedoms. When you combine high turnover and a resistance to shackling freedoms with an all-too-prevalent attitude of knowledge superiority, you have a very tough nut to crack.

Telling survey statistics

In 2012, the University of California Center for Laboratory Safety teamed with the Nature Publishing Group and BioRAFT, a developer of university laboratory management software, and conducted one of the largest surveys of lab safety culture to date. Almost 2,400 respondents participated; 62 percent were from the US and another 21 percent were from the UK and EU, 90 percent of which were from academic research laboratories. Although a great majority of respondents (85 percent) agreed with this statement—"appropriate safety measures in my lab have been taken to protect employees from injury"—a deeper look hints this may not be the case. Here are a few examples.

A basic tenant of lab research is "never work alone." Yet the survey showed that only 7 percent of respondents reported this never happens in their lab. Thirty-five percent said it occurred daily and 80 percent said it was at least a weekly occurrence. The primary piece of personal protective equipment is the lab coat. Yet less than half (46 percent) said that they wear one even though their work requires one at all times. Forty percent disagreed with the statement that their supervisor, lab manager, or PI regularly checks for safe performance of lab duties and proper use of safety equipment. Finally, almost half of all respondents (45 percent)—and 55 percent of those working in large labs (20 to 100 workers)—agreed that "overall safety could be improved in their workplace."

What to do?

We have shown that changing the safety culture in nonindustrial research settings presents unique challenges. These have been clearly identified and well documented due to recent severe and deadly accidents. If you want to be the impetus of change or perhaps begin to elevate the safety culture in your facility, we encourage you to start by becoming familiar with the current knowledge base. The Chemical Safety Board's Texas Tech report identified six key lessons learned from that incident. We have stated them here for you in terms of action items:

- You must go beyond OSHA's Laboratory Standard (29CFR 1910.1450) and ensure your safety management plan addresses all hazards, especially physical hazards and physical hazards of chemicals.
- Your institutional chemical hygiene plan and standard operating procedures must verify that all research-specific hazards are fully evaluated and mitigated.
- You must recognize the lack of current standards and guidance on hazard evaluation and mitigation and risk assessment addressing the unique issues in nonindustrial research labs. Most are specific to industrial settings and not fully transferrable to your environment.
- Written protocols and training specific to the research are absolutely necessary.
- Your institution's organizational structure must ensure direct reporting from the safety inspector/auditor to an individual/office with "authority to implement safety improvements."
- Previous incidents and near-misses must be documented, tracked, and communicated in order to provide education and improvement to safety programs.

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The National Research Council's Safe Science goes even deeper into what safety entails and how we shift from mere compliance to promoting a strong and positive culture of safety. This report discusses the different safety systems and cultures and looks at the knowledge base, including those from aviation, healthcare, and nuclear industries. The characteristics of nonindustrial organizations and their roles, responsibilities, and accountabilities are examined. The knowledge gaps for these settings are explored and ideas to address safety dynamics are presented.

Safe Science is a comprehensive and excellent review of safety culture and a must read for laboratory managers and principal investigators alike. It concluded with 15 findings, nine conclusions, and nine recommendations. We'll summarize the recommendations for you.

1. Leadership. Top management must actively demonstrate and show ongoing commitment that safety is a core value of the institution.

2. Performance Linked. Promoting a strong, positive safety culture should be one of the criteria for promotions, tenure, and salary decisions.

3. Resource Based. Identify and design research that can be done safely based on limited and constrained resources.

4. Risk Management. Develop risk management plans with input from all stakeholders. Direct resources and establish policies to maximize a strong safety culture.

5. Teamwork. Use support organizations (e.g., Environmental Health and Safety), teams, and groups to build a safety culture.

6. Teamwork 2. Provide means and encourage collaboration between researchers, principal investigators, and EH&S personnel.

7. Review. Establish and require incident and near-miss reporting. Document and centralize information. Communicate lessons learned.

8. Evaluate. Establish and require research-specific hazard analyses.

9. Training. Develop and implement initial, ongoing, and periodic training to ensure understanding of associated hazards and risks. Ensure the ability to use proper protective measures and mitigate potential harm.

What is more important than ensuring research is performed in a safe manner and that workers leave at day's end as healthy as when they arrived that morning? We have a duty to instill the mind-set that if you cannot do the research using the best safety practices, then you shouldn't do it at all. We all need to share the best ideas and best practices when it comes to safety. And, we should always strive to ensure that all our employees embrace the very best safety practices.


Photo credit: Google Images

Defrosting Laboratory Freezers

By Peter Nagle

Laboratory cold storage and the protection of sensitive samples rely heavily on temperature uniformity. Manual defrost freezers will ultimately provide the best temperature uniformity when maintained properly, but manually defrosting a freezer can be strenuous and time consuming. Whether your laboratory consists of ultra-low temp freezers, deep chest freezers or even standard upright and under counter freezers, the defrosting process is the same.

Why and when should you defrost your freezer?

This question relies on your laboratory's standards or preferences and what you are storing in your freezer. You must constantly monitor your freezer's frost and internal temperature in order to ensure your samples are safe. When frost builds up in a freezer, it begins to insulate the walls which will eventually warm the internal chamber. More Frost = Less Temperature Uniformity.

A good rule of thumb is to not let the frost build up more than ¼ to a ½ inch of ice. If any temperature fluctuations begin to occur and frost build up is visible in your freezer, it's probably a good time to defrost. Defrosting will not only save your samples and your research, but will also extend the life of the freezer.

Before you defrost, PLAN AHEAD!

1. <u>2-day process:</u> Make sure you plan for at least 48 hours of freezer downtime

2. <u>Back-up freezer available</u>: Contact Facilities beforehand to make sure there is a freezer available when it is needed. Facilities can provide a back-up freezer to any lab, but will do so in the order requested.

3. <u>Alert other users</u>: Most likely there are multiple people using your lab, so the freezer you are defrosting will contain samples from more than one lab. Make sure all laboratory personnel know which freezer(s) you will be defrosting and where the samples will be temporarily stored.

Once you have a scheduled timeframe, a backup freezer set up, and alerted all personnel, you are ready to begin the defrosting process.

Defrosting Procedure:

1. <u>Remove everything from freezer</u>: Remove all contents from the freezer you are about to defrost and place them into the back-up freezer. Make sure this freezer is at optimal temperature for the specific samples you are storing.

2. <u>Unplug the freezer</u>: Unplug your freezer to begin the warm up/melting process. It is best to do this in the morning so you can monitor any water or ice runoff throughout the day.

3. <u>Let it melt away, NEVER CHIP AWAY</u>: Melting can take a while and it has to be monitored and cleaned up frequently so water doesn't run everywhere in the lab. To speed this up, work from the top down and spray (or sponge) hot water on the coils and wire racks and set up a reservoir system for the water to run into a bucket or pan. NEVER USE SHARP OBJECTS TO CHIP AWAY AT THE ICE! THIS COULD PERMANENTLY DAMAGE THE FREEZER!

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4. <u>Dry it out</u>: Once the ice has completely melted you need to make sure the freezer is completely dried out so ice does not form once the freezer is plugged back in.

5. <u>Plug it in</u>: Place your freezer back in its normal space and plug it in. Allow enough time for the unit to come back down to the desired temperature.

6. <u>Return contents</u>: Once your freezer has reached the set temperature, you can return your samples back to the freezer.

Remember, the entire process of de-frosting freezers is the individual lab's responsibility, not Facilities. Facilities will only provide the equipment needed.

Emergency Egress by Ronnie Souza

Emergency egress is critical during an emergency situation such as a fire. During a fire, timing and quick response are essential to save lives and property. Unobstructed emergency egress ensures that building occupants can exit a building to safety.

IMPORTANT!
Each location within a building must have a clear means of egress to the outside. The following sections offer safety guidelines and procedures for maintaining emergency egress.

Corridors, Stairways, and Exits

IMPORTANT!
There must be at least 44 inches clear width of unobstructed, clutter-free space in all corridors, stairways, and exits.

Follow these guidelines to promote safe evacuation in corridors, stairways, and exits:

- Keep all means of egress clean, clutter-free, and unobstructed.
- Do not place hazardous materials or equipment in areas that are used for evacuation.
- Do not use corridors or stairways for storage or office/laboratory operations. Corridors may not be used as an extension of the office or laboratory.

Fire Doors

A fire door serves as a barrier to limit the spread of fire and restrict the movement of smoke. Unless they are held open by the automatic systems, fire doors should remain closed at all times. Do not tamper with fire doors or block them with equipment, potted plants, furniture, etc.

Fire doors are normally located in stairwells, corridors, and other areas required by Fire Code. The door, door frame, locking mechanism, and closure are rated between 20 minutes and three hours. A fire door rating indicates how long the door assembly can withstand heat and a water hose stream.

Always keep fire doors closed. If it is necessary to keep a fire door open, have a special closure installed. This closure will connect the fire door to the building's fire alarm system, and will automatically close the door if the alarm system activates.

IMPORTANT!
Know which doors are fire doors and keep them closed to protect building occupants and exit paths from fire and smoke. Never block a fire door with a non-approved closure device such as a door stop, block of wood, or potted plant. For fire doors with approved closure devices, make sure that nothing around the door can impede the closure.

Never alter a fire door or assembly in any way. Simple alterations such as changing a lock or installing a window can reduce the fire rating of the door.

Doors to offices, laboratories, and classrooms help act as smoke barriers regardless of their fire rating. Keep these doors closed whenever possible.

REMEMBER
A closed door is the best way to protect your path to safety from the spread of smoke and fire.

Unacceptable hallway and corridor storage

UNE Chemical Sharing Program

The UNE Chemical Sharing Program is a great way to reduce hazardous waste, reduce costs for your department, and have a positive environmental impact on campus. If you have any commonly used lab chemicals that you are thinking of disposing, please contact EHS so they can be listed in the next issues of EHS Lab Chatter as available for the UNE Chemical Sharing Program.

Chemicals currently available:

No items available at this time.

Quarterly Hazardous Waste Pick-Up

There will be a hazardous waste pick-up
Monday, November 13th.
Please contact EHS to pick up any waste or old chemicals you may need to dispose of before this time period.

Contact us

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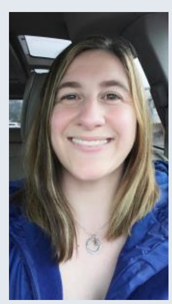

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