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Environmental Health & Safety

SafetyMatters

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ENVIRONMENTAL HEALTH & SAFETY

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National Safety Month, and Beyond

by Christopher Pitoscia, Manager of Research Safety Programs

Safety takes center stage with the annual observation of June's National Safety Month as a time to bring attention to key safety issues. Columbia University will be celebrating this year with the continuation of a multi-faceted Research Safety Campaign to provide laboratories with the information, tools and assistance they need to ensure the safety of their personnel and operations.

EH&S met with hundreds of researchers over the past several months to introduce a variety of initiatives and increase awareness of some of the key components of our safety strategy. Overwhelmingly, you, the research community, were supportive of our planned efforts to engage and offer solutions on a variety of key safety topics, including eating and drinking in the lab, personal protective equipment, and an improved laboratory survey experience. We have heard you loud and clear.

On the heels of these introductory efforts, EH&S has begun the first iteration of our new survey model, focusing the scope of each visit to several fundamental safety topics. We started with a thorough examination of the safe use of cold and warm environmental rooms, and the results of these surveys will be made available soon, including detailed information on how your laboratory stacks up to your peers within your department, building, and campus. Please look for the Research Safety team and EH&S staff in your laboratories and building lobbies in the coming weeks and months, and please join us at an upcoming forum to discuss important safety trends and issues – more information to follow.

The results of this and future surveys will be communicated to laboratories individually, as well as through the use of a new database, the Columbia Laboratory Information Online Network (the LION). The LION will allow for the streamlined collection, bidirectional distribution and management of safety survey observations, reducing delays in the closure of surveys and the need for laboratories to manage paper forms or email communications.

Finally, we've had some fun along the way, with giveaways, prizes and other incentives. We will continue to be on the lookout for Safety Champions and to recognize all of the work that you do. Please stay tuned for additional photo and video challenges, safety messages from your colleagues and peers, social media engagement and other opportunities to show us your best (and safest) stuff! Follow the latest happenings @ http://ehs.columbia.edu/SafetyCulture.html

EH&S website offers enhanced navigation http://ehs.columbia.edu

When working in the laboratory, eating, drinking or applying cosmetics is prohibited.

Proper work attire (long pants, closed toe shoes) and PPE (e.g., laboratory coat, gloves and eye protection) must be worn when working in the laboratory.

Remember to periodically flush your laboratory cup sinks and floor drains with water to prevent sewer gases from migrating into your laboratory.

On-line Chemical Waste Pick-up Request Form http://vesta.cumc.columbia.edu/

For Lab Fire Safety Prevention tips, check out FDN(wh)Y Me http://www.ehs.columbia.edu/FDNYMe.html

A+ Effort

by Keith Bottum, Senior Hazardous Materials Specialist and Lab Sustainability Coordinator

During Fall 2014, EH&S's Hazardous Materials Team initiated a University-wide effort to evaluate chemical, radioactive and regulated medical waste compliance in all laboratory spaces. These surveys indicated an impressive rate of 92% overall compliance with laboratory waste management practices.

Coincidentally, during the same period, the New York State Department of Environmental Conservation (NYSDEC) conducted a 2-day unannounced inspection of select laboratories and chemical waste storage rooms at the Morningside campus. NYSDEC had no findings and made no recommendations during the inspection.

Three months later, the United States Environmental Protection Agency (EPA) initiated a 3-day unannounced inspection at the Medical Center. EPA visited a representative sample of laboratories in Irving Cancer Research Center, Russ Berrie Pavilion and Vanderbilt Clinic. Similar to NYSDEC's inspection at Morningside, EPA had no findings and made no waste management recommendations at the Medical Center.

These favorable regulatory inspection outcomes validated the results of the assessment EH&S performed during Fall 2014 and come as no surprise. EH&S extends a sincere "thank you" to the entire University research community for your continued commitment to following best management practice standards and helping University laboratories remain "inspection-ready" at all times.

EPA intends to return in Summer 2015 to conclude the CUMC inspection and will visit laboratories in Black Building, Physicians & Surgeons and Vanderbilt Clinic. EH&S is actively working with laboratories in these buildings to refresh them on waste management practices in preparation for EPA's return. In addition, EH&S will re-emphasize several laboratory hygiene practices that were observed during the first round of EPA's inspection. These topics include chemical segregation and storage, the use of flammable materials cabinets and secondary containment, and general laboratory housekeeping to ensure alignment with University guidance and best practices.

Children and Minors in University Laboratories by Research Safety

As summer approaches, EH&S would like to remind the Columbia University research community about the University's Policy regarding the presence of children and minors in laboratories.

> *No one under the age of 14 is allowed into a Columbia University Laboratory at any time, unless present on an organized tour or field trip for strictly observational purposes. (Even if a child is under the supervision of a parent or guardian, their presence is strictly prohibited.) In addition, no one under the age of 18 is allowed to handle human blood, human cell lines or "other potentially infectious materials," research animals, or be left unattended in a lab.*

Please note, children are also prohibited from offices that are located within a laboratory. Safety in University research operations is a top priority and is the driver for this policy. EH&S thanks you in advance for your understanding and continued cooperation in promoting and maintaining a safe and healthy workplace. For more information please refer to page five of the Guidelines for Short-term Visitors in Research-related and Clinical Activities located @ http://evpr.columbia.edu/files/evpr/pdf/Guidelines_for_Short-term_Visitors.pdf.

Radioactive Materials Permits by Corey Wintamute, Senior Research Safety Specialist

Working with radioactive materials (RAM) in the laboratory comes with certain responsibilities. Some of those responsibilities include administrative duties that must be performed on an ongoing basis to prepare the laboratory for quarterly audits performed by EH&S. Over time, procedures, personnel, technology, and scientific pursuits may change, however, and experiments that required the use of RAM become a thing of the past. For permit holders who find themselves in this situation, there are options.

Permit holders who are no longer working with RAM, but do not wish to terminate or surrender their permit, have the option to reclassify their permit as "inactive." Under this option, users keep their RAM permit, but are no longer required to maintain the radioactive materials binder, including the administrative duties of training, monthly surveys and filing of dosimetry reports; labs are not subject to quarterly audits while inactive. The process of making a permit inactive can be completed in less than two weeks. Please note, after a permit has gone inactive, RAM cannot be purchased or stored.

The process to reclassify a permit as inactive requires four simple steps:

1. The permit holder makes a written request to the Radiation Safety Officer.
2. A waste pickup request is submitted by the PI or Lab Manger for all RAM (waste, stocks, samples) in the laboratory.
3. The laboratory arranges an exit survey with EH&S after the RAM has been removed.
4. EH&S completes a final radiation exit survey confirming that all RAM has been removed and that there is no residual contamination. Once confirmed, stickers and signage are removed.

In the event that the permit holder wishes to resume RAM work and re-activate their permit, the process is even simpler and can typically be completed within a week's notice.

1. The permit holder makes a written request to the Radiation Safety Officer.
2. EH&S conducts an entry survey to provide signage and waste containers.
3. Laboratory personnel update training.
4. EH&S reactivates the permit.

For more information, or if you are considering reclassifying your permit, please contact the Radiation Safety Program at CUMC: rsostaffcumc@columbia.edu or Morningside: rso-ehrs@columbia.edu

Are Your Cylinders Secured? by Harry J. Oster, Senior Fire Safety Officer

In accordance with New York City Fire Code, compressed gas cylinders, whether full or empty, must be secured at all times to prevent movement from contact, vibration or seismic activity. Cylinders may be secured utilizing one or more of the following methods:

1. To a fixed object with one or more noncombustible restraints. Note: cylinders shall not be secured to plumbing systems or electrical conduits.
2. On a cart or other mobile device specifically designed for the movement of compressed gas cylinders.
3. Within a rack, framework, cabinet or similar assembly designed for such use (i.e. floor base holder), except when the cylinders are in the process of examination, filling, transport or servicing.

Unsecured cylinders have been cited by the Fire Department of New York (FDNY) during weekly laboratory inspections. If you have compressed gas cylinders in your lab and are not sure if they are properly secured, please contact EH&S Fire Safety for an assessment: fire-life@columbia.edu

Additionally, valves of compressed gas containers designed to accept protection caps or other protective devices shall have such caps or devices attached. Outlet caps or plugs shall be in place except when the compressed gas containers are in use or are being serviced or filled.

Spotlight on Safety-Greener Chemistry by Kathy Heinemann, Research Safety Specialist

Making a change in our standard protocols is easier said than done, even when we are presented with healthier options. For this season, I would like to highlight the researchers and students in the Ruben L. Gonzalez laboratory, who have jointly decided to change from using ethidium bromide to a less toxic alternative. Kelvin Caban, a postdoctoral research fellow, describes how and why they made the switch:

"Gel electrophoresis is a standard molecular biology technique that we use frequently to qualitatively inspect for the presence and quality of DNA and RNA, and to purify these nucleic acids for other downstream applications (*e.g.*, cloning). In the past, our method of choice for visualizing nucleic acids involved staining gels with ethidium bromide (EtBr), which intercalates into the nucleic acid and fluoresces when excited with ultraviolet (UV) radiation. Although EtBr is an effective stain, it is also a mutagen, a potential carcinogen and a potential reproductive toxin. In an effort to minimize our occupational exposure to hazardous materials, we have recently decided to switch to using Sybr® Safe, a less toxic and environmentally-friendly nucleic acid gel stain. In addition to being less hazardous, Sybr® Safe has the added benefit that nucleic acids that are stained with it can be visualized with blue light instead of UV light. This was a big selling point for us because we routinely perform gel extractions, which involves the excision of a UV-illuminated DNA or RNA sample from a gel. Gel extractions result in the prolonged and unnecessary exposure of the user and the nucleic acid sample to UV radiation. This not only poses a health risk, but may also damage the nucleic acid sample making downstream applications, such as cloning, less efficient. Although there were some initial concerns about the efficacy of Sybr® Safe relative to EtBr, two of our senior lab members with previous experience using Sybr® Safe, have assured us that it is extremely sensitive and can be used to stain nanogram quantities of both DNA and RNA."

Laboratory Relocation Guide by Christina Clark, Research Safety Specialist

Columbia University plans for and executes numerous laboratory moves every year. Whether the laboratory move is on campus, between Columbia University campuses or to another institution, each move presents challenges related to the relocation/disposition of hazardous chemicals, biological materials, radioactive isotopes, and controlled substances. Agencies such as the Department of Transportation and International Air Transport Association set strict requirements for ground and air transport of hazardous materials. Detailed knowledge and careful planning are required to ensure transportation safety and compliance.

EH&S has developed the *Columbia University Laboratory Relocation Guide* to ensure that all stakeholders involved in the laboratory relocation process have a transparent and consistent framework to utilize in ensuring a safe and compliant move.

The user-friendly guide includes complementary forms to help in the relocation process, including the *Ideal Laboratory Move Timeline, Custom Timeline Template,* and *Laboratory Vacating Checklist*. The guide provides clients with up-to-date, specific instructions for a variety of pre-clearance procedures. Laboratories will be also able to submit an online *Laboratory Relocation/Decommissioning* form to EH&S, completed with information such as the anticipated move date, move location, types of hazardous materials that require relocation, contact information, project manager information, and department administrator information. This information will greatly assist EH&S in expediting project-related services. For more information on how to relocate your laboratory, the *Columbia University Laboratory Relocation Guide* can be accessed later this summer @ http://ehs.columbia.edu/LabRelocationGuide.html

Dual Use Research of Concern by Christopher Aston, Senior Biological Safety Officer

Following national attention on the publication of two avian influenza (H5N1) studies that demonstrated expanded transmissibility of the virus, the research community has been engaged in a philosophical and policy debate over how to address the challenge of "dual-use" life science research. Dual-use research of concern (DURC) is roughly defined as research that is intended for legitimate, beneficial purposes, but also carries a risk of being misused for malicious purposes. The response from the U.S. government is in the form of the "United States Government Policy for Oversight of Life Sciences Dual Use Research of Concern," which will take effect on September 24, 2015. In order to comply with the government's DURC Policy, the Columbia University Office of the Executive Vice President for Research (EVPR) and the Institutional Biosafety Committee (IBC) have created an internal policy (the CU Policy) that outlines oversight responsibilities for Columbia University stakeholders, including Principal Investigators (PIs). These responsibilities include establishing institutional mechanisms for identifying potential dual use research, providing for expert committee review of such research and developing standards for risk assessment and management. The CU Policy is available on the EVPR website @http://evpr.columbia.edu/files/evpr/pdf/DURC%20Policy%20February%202015%20Final.pdf

The DURC Policy only applies to certain types of experiments using specific high consequence materials. Nonetheless, PIs are requested to review the CU Policy to verify whether their research employs any of the fifteen infectious agents or toxins to generate any of the seven experimental effects of concern. If so, please contact the IBC to determine whether you may be subject to the CU Policy, or if you have any questions contact biosafety@columbia.edu.

Clean Your Coils! by Harry J. Oster, Senior Fire Safety Specialist

Whether located at the University or in your home, the refrigeration coils on all refrigerators and freezers must be regularly cleaned in accordance with manufacturer's instructions to ensure safe and efficient operation. Cleaning may be necessary as often as every month – a quick visual is typically your best indicator. Coils and/or coil filters are either found in the front-bottom, or on top of the unit. Occasionally they are also found in the rear of the unit.

Failure to regularly clean the coil and/or filter can cause the unit to:

1. Work harder and longer to keep it functioning properly, thus shortening its useful life
2. Use more energy
3. Overheat and/or fail unexpectedly, compromising the unit's contents, which can lead to significant loss in a research laboratory
4. Create a fire condition. A recent fire at CUMC was caused in a laboratory when the excess stress placed on the unit's electrical and refrigeration components resulted in overheating

A service contract is a proactive way of maximizing a unit's efficiency and lifespan. Short of a service contract, one can contact Facilities to discuss cleaning laboratory equipment coils to remove lint build-up or take a "do-it-yourself" approach. Additionally, consider contracting with a company that can install equipment to monitor the temperature of your critical laboratory refrigerators and freezers. A monitoring service can provide both peace of mind and immediate notification if there is a temperature excursion beyond the normal operating range, so you can intervene quickly to prevent a loss of valuable research materials.

Photo shows build-up of lint across the refrigeration coils. Build-up causes the unit to work harder, run longer, use more energy, and places strain on electrical and refrigeration components that can lead to a fire.

For more information about critical equipment monitoring, please contact labsafety@columbia.edu.

A Nuclear Reactor at Columbia University? by Michael Kennedy, Senior Health Physicist

Most would shudder at the thought today, but in the 1950's and 60's a nuclear reactor was considered an important item for a major research university to own. For example, The University of Missouri, North Carolina State University, the University of Chicago, University of California Irvine and others built reactors for research and training purposes during this era. Amid this growing trend, Columbia's Nuclear Science and Engineering Program in 1960 applied for and obtained a $1 million grant from the National Science Foundation which they used to purchase a TRIGA Mark II reactor. TRIGA reactors are typically a "pool" type, in which uranium fuel rods are lowered into a "swimming pool" and utilize the water in the pool as the neutron moderator, cooling agent, and radiation shield for the unit. These reactors were favored by academic research institutions because they are engineered to have a low risk of meltdown and do not require a containment building to shield the unit.

The University was approved to start construction in 1963 by the Atomic Energy Commission (AEC) and the project began the following year. In 1968 the University applied for its license from the AEC to operate the unit. The student protest movement was active on campus at that time, however, and in view of the unrest related to the construction of a Columbia gymnasium at Morningside Park and the general dissent among the surrounding community toward the presence of a nuclear reactor on campus, the AEC ultimately denied Columbia's request to operate the reactor.

The University re-applied in 1969 and a hearing was held before the Atomic Safety and Licensing Board (ASLB); the Board again denied the application. The ASLB was concerned that the site did not meet the criteria expected of a research reactor and there were conflicting reports as to how much radioactive material could be released in the event of an accident. The accidental release scenario was evaluated a second time, and in 1971 the ASLB reversed course and recommended issuing a license to the University to begin operation of the reactor. When the local community became aware, a lawsuit was filed in federal court appealing the decision of the ASLB. The Appeals court denied review and the case was taken up by the United States Supreme Court in 1974. The Supreme Court also sided with Columbia ruling that the reactor could move forward.

Finally, however, after six years of regulatory and legal battles the Nuclear Science and Engineering Program re-evaluated its needs and decided not to complete the installation. Eventually, the Program was incorporated within the Department of Applied Physics and Mathematics, and all that remains of the never-fueled reactor is a concrete shell and a few rooms built to support its operation.

SAFE Disposal by Chris Pettinato, Executive Director

Columbia University and Teachers College have again partnered with the New York City Department of Sanitation (DSNY) to host a NYC SAFE Disposal Event. The upcoming event, scheduled for Sunday June 28, 2015 on 120th Street, between Amsterdam Avenue and Broadway, is for NYC residents to properly dispose of household chemicals, automotive chemicals, batteries, medications, sharps/syringes, mercury thermometers, and used electronics. The previous Columbia-hosted SAFE Disposal event on April 28, 2013 saw 1,200 residents bring more than 60,000 pounds of hazardous household products for proper disposal.

DSNY mailed a flier on May 27th to over 386,000 Manhattan households within local community boards 7, 8, 9, 10, 11 and 12 announcing the event. DSNY is also planning social media initiatives via Twitter (@NYCRecycles) and Facebook ("NYC Recycles") to promote the event. Visit on.nyc.gov/safeevents for more information on SAFE Disposal Events throughout the 5 Boroughs.

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