SafetyMatters

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Environmental Health & Safety

Website
http://ehs.columbia.edu

Irving Medical Center
Phone: (212) 305-6780

Morningside and Manhattanville
(212)-854-8749

Radiation Safety
Phone: (212) 305-0303

Instagram

@columbiaehs

No License, No Problem? The Hidden Rules of "License-Free" Radioactive Materials

By Angela Meng, Director and Radiation Safety Officer, Research Radiation Safety Program

In most cases, obtaining and using radioactive material requires a specific license issued by a regulatory agency. However, certain materials for specific uses may be obtained under what is known as a "general license" which is a kind of blanket approval for those materials. While this flexibility is intended to streamline access to low-risk sources, it does not exempt these materials from compliance with other regulatory requirements. Institutions and individuals are still responsible for proper inventory tracking, safe handling, periodic leak testing (in some cases as frequently as every three months), and ultimately, the appropriate disposal of these materials as radioactive waste. To ensure consistent oversight and compliance, Radiation Safety requires that any user of generally licensed RAM obtain a RAM permit, just like any other user of licensed radioactive material.

Common examples of generally licensed RAM found in research and laboratory environments include mass spectrometers with thorium-coated filaments, gas chromatographs with nickel-63 electron capture detectors (ECDs), analytical balances using polonium-210 static eliminators, and uranyl acetate compounds used in staining for electron microscopy. Although suppliers may sell these items without requiring proof of a RAM license, their status as restricted radioactive commodities remains unchanged. Therefore, all such purchases must receive prior approval from Radiation Safety and cannot be made using purchasing cards (p-cards) or through standard procurement channels without review.

Left: ECD in a GC, Center: Static eliminator in an analytical mass balance, right: Uranyl acetate.

Disposal of generally licensed consumer products at Columbia University is subject to regulatory requirements, and these items are managed as radioactive waste. Tritium exit signs, for example, which contain small amounts of tritium gas sealed in glass tubes, are considered generally licensed but are treated with the same level of caution as other radioactive waste. Similarly, older smoke detectors that may contain americium-241, nickel-63 or radium-226, although widely used in homes and institutions, require controlled disposal methods to prevent environmental contamination or unauthorized handling. These consumer products can be overlooked when buildings are renovated or decommissioned, leading to potential violations if they are discarded as ordinary trash. Proper disposal typically involves returning the device to the manufacturer or using a licensed radioactive waste broker.

The responsibility for managing generally licensed RAM lies with both the user and the institution. While these items may seem routine or low-risk due to their general license status, they are subject to strict regulatory oversight once in use or at time of disposal. Users must be aware that ownership does not end with purchase; it includes long-term accountability for safe use, leak testing, secure storage, and final disposal. To support safe and compliant use across the institution, Radiation Safety provides guidance and oversight, and encourages early communication before any acquisition or disposal of generally licensed materials. Radiation Safety can always be reached at rso-ehrs@columbia.edu or 212-305-0303.

Top: Caution Radiation label on tritium exit signs, Bottom: Caution Radiation labels on smoke detectors.

"If You Spill it, EH&S Can Clean It!" Even Coffee!

By Lauren Kelly, Senior Project Manager, Safety and Regulatory Affairs

Have you ever wondered how EH&S always seems to know how to clean up anything that laboratory personnel might spill? It's because EH&S gets a lot of practice! A wipe with a paper towel makes quick work of a coffee spill in the office, but for everything else – from biological to chemical to radiological spills – EH&S can respond safely, compliantly, and efficiently. The surface may be permanently altered, but the area will be returned to full operation as efficiently as possible—and at no cost to research groups.

Thanks to support from University Senior Leadership, EH&S has the resources and capabilities to respond to a wide range of emergencies—from Indoor Air Quality issues to the "spill of the day." In certain cases, EH&S even responds 24/7 to support essential operations and help keep research spaces safe, functional, and environmentally sound.

In the event of a spill, the EH&S emergency response team brings decades of experience and specialized training to the scene. Each responder has completed at least 8 hours of OSHA HAZWOPER (Hazardous Waste Operations and Emergency Response) training as required under 29 CFR 1910.120(q). The majority of responders have completed 24 hours of training, and several have completed 40 hours. In addition, EH&S responders are trained under the National Incident Management System (NIMS), including ICS levels 100, 200, and 300—representing industry best practices for managing emergency and non-emergency incidents.

Every year, EH&S emergency response team members complete an 8-hour HAZWOPER refresher course. This training covers:

- Actions responders should take upon arriving at a spill
- Initial defensive strategies to control, contain, or confine hazards
- Determination of whether the incident qualifies as an emergency
- Identification of physical and chemical hazards
- Establishment of an Incident Command structure
- Creation of contamination control zones to reduce exposure
- Selection and evaluation of required PPE (Personal Protective Equipment)
- Development of corrective and remediation measures

As part of this training, EH&S staff practice essential hands-on skills such as donning and doffing PPE and using specialized equipment to prevent the spread of contamination to themselves, to others, or to nearby areas. Tabletop exercises are also conducted to work through esponse scenarios in a low-stakes, no-fault setting. Often, these drills are taken into the field, where personnel practice in vacant labs or other campus environments where spills commonly occur. When donned in specialty PPE, EH&S responders may resemble characters from a science fiction movie, but every step is in service of safely resolving the "spill of the day."

EH&S responding to a mixed waste spill

EH&S is ready to support the research community when needed. If laboratory personnel need assistance, they are encouraged to contact EH&S during business hours at 212-305-6780 or 212-854-8749, or to reach out to their campus Public Safety office after hours.

EH&S responders practicing tabletop skills in a classroom

EH&S spill responders practicing personnel decontamination techniques

Dr. Christopher Aston earns Certified Biological Safety Professional (CBSP) Credential

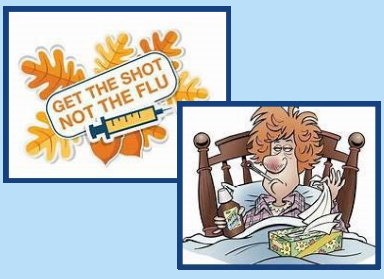
Congratulations to Dr. Aston! A Certified Biosafety Professional is recognized for their advanced knowledge and expertise in biosafety principles and practices, including containment, risk assessment, and the safe handling of biological materials.

Battery Recycling Program

To improve safety and reduce risks, EH&S has improved the battery recycling program by consolidating collection containers and increasing service frequency at centralized locations. Find your nearest battery recycling bin by clicking this link BatteryRecyclingReceptacle Locations.pdf or scanning the QR

Access to Dosimetry Record

EH&S has provided an easier way for dosimeter badge wearers to access their personal records! Please use the QR code to learn more:



Don't Forget Your Influenza Vaccine

Mind the Dewar: A Shift in LN_2 Handling Responsibilities

By Holland Howard, Safety Advisor II

Effective as of July 2025 as part of an operational service change, Airgas will no longer provide refills for small cryogenic dewars on campus. Moving forward, each laboratory will be responsible for ordering their own liquid nitrogen tanks, monitoring the equipment, and filling up sample dewars. This change affects all laboratories that previously received recurring small dewar refills.

Under the new model, each laboratory must order either a 180-liter or 230-liter liquid nitrogen supply tank, depending on its available space and expected usage. Usage patterns may vary based on research activities, and labs are encouraged to monitor closely and adjust their ordering frequency as needed.

Oxygen Monitoring Devices

Because liquid nitrogen displaces oxygen as it evaporates, it can create a serious asphyxiation hazard in enclosed or poorly ventilated spaces. In accordance with FDNY regulations, to mitigate this risk, continuous oxygen level monitoring is required in rooms where liquid nitrogen is stored in amounts exceeding 60 gallons. An audible alarm will be triggered if oxygen levels fall below 19.5%.

Therefore, if a laboratory chooses to use a 230-liter liquid nitrogen tank, the room must have an operational oxygen sensor installed.

To improve safety and efficiency, laboratories are encouraged to order only what is needed or share liquid nitrogen tanks whenever feasible. If an oxygen sensor is already installed in a common equipment room, laboratories should store their liquid nitrogen tanks in that space whenever possible.

Please reach out to labsafety@columbia.edu if an oxygen sensor will be required in accordance with the above, prior to ordering a liquid nitrogen tank.

Safety and Best Practices

During filling, personnel must continuously monitor the process. Leaving a dewar unattended can result in overfilling or freezing of valves, both of which pose safety risks.
All personnel involved must wear proper personal protective equipment (PPE), including:

- Face shield or safety glasses
- Cryogenic gloves
- Closed-toe shoes
- Lab coat (recommended)

Training

This shift in service requires affected laboratory personnel to become familiar with the basic components and safe handling of cryogenic systems.

To support labs in making this transition smoothly and safely, new training is now available. All laboratory members who will be responsible for filling liquid nitrogen dewars should complete the safety training Liquid Nitrogen Transfer (TC7700) available on RASCAL. This training includes information on:

- Personal hazards/Liquid Nitrogen Tank Hazards
- Tank components and Usage
- Proper PPE and Emergency Procedures
- Stepwise Instructions for Dewar Filling procedure

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Meet the EH&S Staff

Hadeline Hanonik

SafetyAdvisor II

Hadeline Hanonik, Safety Advisor II, has been an integral part of the Columbia University community for almost two years. With a passion for safety and a commitment to excellence, Hadeline plays a crucial role in ensuring a healthy environment for students and staff alike. Hailing from White Plains, New York, Hadeline shares an interesting piece of history about her hometown: it is known as "The Birthplace of New York" — the first public reading of the Declaration of Independence in the state happened there on July 11, 1776, marking both independence and the formation of New York State.

Hadeline describes herself as laid-back, much like a koala—chill and easygoing. A quote that resonates with her comes from climate activist Greta Thunberg: "I want you to act as if the house is on fire, because it is," reflecting her strong sense of urgency around the climate crisis.

Hadeline got her start at Buffalo Wild Wings, where she learned the importance of teamwork and a strong work ethic. She's driven by a desire to keep learning and pushing herself, always looking for new ways to grow. In her downtime, she enjoys reading, catching up on her favorite shows, or staying active with workout classes.

In her free time, Hadeline enjoys reading and exploring fashion, often putting together outfits that show off her personal style. She's known for her loyalty and sense of humor, always bringing positive energy to those around her. A big sports fan, she's especially passionate about the New York Knicks. Outside of work, she loves spending time with friends and family, listening to music, and dancing. She's also curious about space and hopes to learn more about the universe.

If she could live anywhere, Hadeline would choose Copenhagen, Denmark, drawn to its focus on sustainability and abundance of green spaces. She's passionate about protecting the planet, believing it's essential to preserve a healthy, livable Earth for future generations.

Currently, Hadeline is working on an exciting project involving the redesign of the EH&S homepage, a task that showcases her creativity and dedication to improving communication within the university. The best piece of professional advice she has ever received is to always seek feedback and learn from others, a principle she applies in her daily work.

Set your clocks back one hour on November 2, 2025

Marianne McCartney

Research Safety Program Coordinator

Marianne McCartney, the Research Safety Program Coordinator at Columbia University, has been a vibrant part of the campus community for approximately 18 months. Guided by her commitment to safety and the highest standards, she has quickly made her mark! Originally hailing from Buffalo, NY—the birthplace of chicken wings—Marianne has had a fondness for spicy food ever since her first bite. She has a deep sense of pride for her hometown, and actually misses the cold weather, snow, and how the city would smell like Cheerios.

If you were to ask Marianne what animal she feels most resembles her personality, she would pick a unicorn! With a whimsical spirit and a heart full of kindness, she embodies the magic and uniqueness of this mythical creature. Her favorite quote is from her fictional millennial hero, Jessica Day: "I brake for birds. I rock a lot of polka dots. I have touched glitter in the past twenty-four hours…and that doesn't mean I'm not smart and tough and strong." This quote reflects her belief that one can be both playful and resilient.

When it comes to sports, Marianne is a fan of Taylor Swift's Boyfriend's Team (aka, the Kansas City Chiefs), a lighthearted nod to her love for pop culture and being a "Swiftie." In her downtime, she enjoys reading, especially with her son, Finn.

Living in Queens, Marianne feels a strong connection to her community and wouldn't want to call home anywhere else. She loves exploring the city with her toddler, visiting zoos, parks, libraries, sprinklers, and discovering new parts of the city together.

Marianne's first job was as a Camp Counselor at an overnight summer camp on beautiful Lake Chautauqua, NY, where she learned the value of teamwork and leadership. Today, she is motivated by sweet treats at the end of the day and the satisfaction of a job well done.

After work, Marianne loves to unwind by having dinner and spending time with her family, treasuring the moments that matter most. She would love to learn a second language and connect with even more people and cultures.

Currently, she is working on exciting projects with the Safety Advisors and Admin team, and she believes the best piece of professional advice she's ever received came from another fictional hero, Leslie Knope: "Go find your team. Get to work. Whatever that work is that you find worth doing. Do it and find some people to love who'll do it with you."

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For a quick reference, please consult our fact sheet: Liquid Nitrogen Transfer: Technical Guide and Best Practices.

By equipping labs with the proper tools and training, Airgas and EH&S aim to ensure a smooth transition that prioritizes both safety and operational efficiency.

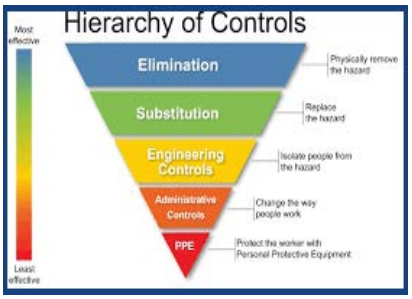
If you have any questions or concerns regarding your liquid nitrogen tank or the new procedures, please contact labsafety@columbia.edu for assistance.

Clearing the Air: Launch of Methylene Chloride Monitoring

By Chara Proud, Heath and Safety Specialist

Methylene chloride, also known as dichloromethane, is a halogenated solvent used in industries ranging from academic research to furniture manufacturing. Valued for its versatility in applications like extraction, degreasing, and paint stripping, methylene chloride has become a highly utilized chemical. Despite its usefulness, methylene chloride has significant safety and health concerns. Between 1980 and 2018, there were 85 methylene chloride related fatalities in the United States (Hoang, et al. 2021). To protect people from exposure to methylene chloride, a new federal regulation has been released.

Under the Toxic Substances Control Act (TSCA), the Environmental Protection Agency (EPA) has the authority to determine the adverse effects of existing chemical substances on human life and the environment. To address the unreasonable risk that exposure to methylene chloride presents, the EPA released new regulations in 2024 to protect against the neurotoxic and carcinogenic effects of methylene chloride exposure. This new regulation prohibits the use of methylene chloride for certain processes, like paint stripping, and creates strict requirements for the continued use of methylene chloride in others, such as in academic research. Included in the new requirements were mandatory monitoring to ensure that exposure to methylene chloride is below the new exposure limits of 2 parts per million (ppm) for an 8-hour workday or 16 ppm for short-term 15-minute exposure.



The new regulation highlighted the use of the Hierarchy of Hazard Controls when determining how to reduce exposure. Elimination and substitution of methylene chloride are strongly encouraged at Columbia, as these are the most effective means of reducing exposure. Guidance is available on the Environmental Health & Safety (EH&S) webpage on safer substitutes for methylene chloride based on the purpose it is used for. For laboratories that are unable to eliminate or substitute methylene chloride, EH&S is available to provide guidance.

To support compliance with the new EPA requirements and to protect researchers, the Occupational Safety team has launched a new methylene chloride monitoring initiative. This initiative uses methylene chloride sampling badges to measure researchers' exposure to methylene chloride, allowing for comparison to the EPA standard. The Occupational Safety team also deployed specialized equipment to provide real-time readings of methylene chloride concentrations. Together, the data from these monitoring efforts inform decisions on how to reduce exposure based on the specific activities being performed.

By monitoring numerous laboratories across Columbia's campuses performing varying protocols, EH&S hash established the following best practices for working with methylene chloride:

- Minimize quantity: Use the smallest volume of methylene chloride possible for the procedure.
- Engineering Controls: Work inside a chemical fume hood or other local exhaust ventilation.
- Seal Containers: Ensure that methylene chloride containers are tightly closed when moving outside of local exhaust ventilation.
- Check pump seals: Confirm a tight seal on drums of methylene chloride that are fitted with dispensing pumps before decanting to prevent vapor release.
- Wear personal protective equipment: Use safety glasses, lab coats, and gloves that are appropriate for all the hazards you are working with. Check the manufacturer's guidance for more information about the protection that your equipment provides.

Based on the results of methylene chloride monitoring, EH&S is creating a Workplace Chemical Protection Plan for methylene chloride, outlining safe practices for methylene chloride use at Columbia University. This plan will include updated resources and training that researchers working with methylene chloride can utilize. Researchers are encouraged to review the new guidance when it is published and contact EH&S for laboratory-specific questions or guidance.

Researchers should also be aware that the EPA has finalized similar restrictions for the use of Perchloroethylene (PCE) and Trichloroethylene (TCE) under TSCA. EH&S is closely monitoring updates from the EPA about TSCA regulations and will provide updated guidance and training as new rules are finalized. If you or your laboratory have any questions about methylene chloride, PCE, or TCE use, please contact EH&S.

Reference List: Hoang, A., Fagan, K., Cannon, D. L., Rayasam, S. D. G., Harrison, R., Shusterman, D., & Singla, V. (2021). Assessment of Methylene Chloride-Related Fatalities in the United States, 1980-2018. JAMA internal medicine, 181(6), 797–805. https://doi.org/10.1001/jamainternmed.2021.1063

New Initiatives at EH&S

By SafetyMatters Editorial Staff

The EH&S Team never rests when it comes to providing safety support to Columbia researchers. New initiatives the team is working on include Riskonnect, a New PI Questionnaire, an Electrical Safety Program, Field Research Safety, and new Radiation Safety updates. Once these projects are released, EH&S will notify the research community. A preview of each of these items follows:

- **Riskonnect** - the paper based accident reporting process will be replaced with an automated electronic system. As part of that process, there will be an online RASCAL-based training tool on how to conduct an accident investigation.
- **New PI Questionnaire** - to help support settling into Columbia, the Research Safety Team has created a questionnaire. Completing it will help ensure they are set up for success and that EH&S has the information needed to provide the right services and support.
- **Electrical Safety Webpage -** is quickly taking shape! It now includes key information on electrical safety concepts and hazards, detailed information for common laboratory equipment, and steps to follow in an electrical emergency. A new training program for researchers will also be available soon. Stay tuned!
- **Field Research Safety** - many researchers conduct fieldwork that extends beyond Columbia's campuses. To support them, EH&S has developed general guidance documents and "Pack and Go Cards" to help with planning. These cards include links to Columbia resources and are designed to point trip organizers in the right direction. They soon will be available through EH&S and should be carried during the trip.
- **Radiation Safety** - released an email to RAM laboratories (on August 21,2025) with the following updates:
  - All RAM requisitions are now routed from ARC to CU MarketPlace.
  - QR codes provide easy access to radiation safety how-to videos.
  - Individual dosimeter records can now be accessed directly through a private link to Landauer's website.
  - Revisions have been made to TC3300 for PIs and Lab Managers and TC3350 for RAM Users.

EH&S looks forward to formally introducing these programs as new tools to help keep the Columbia community safe!

EH&S Website Gets New Look

By SafetyMatters Editorial Staff

Members of the EH&S Team (Sarah Aloe, Hadeline Hanonik, and Jillian Sacheli) worked together to give the Environmental Health and Safety website an updated design making the most frequently accessed information easily available. To achieve this, they reorganized the "Programs" section. Instead of displaying descriptions under each program name, they added quick links to the most relevant resources. The EH&S team would like to thank these team members for

EH&S C-14 Recommendations

To ensure laboratories are compliant with the FDNY regulation requiring a C-14 holder to be present when in operation, EH&S recommends that laboratories with 10 or less staff have at least two card holders and those with more than 10 have 25% of staff with a current C-14 permit.

EH&S Fun Facts

EH&S has assisted 554 researchers obtain a new or renewed C-14 permit in 2025. CUIMC leads the way with 285, Morningside has 226, JLGSC at 15, and the rest split among our affiliates.

Editorial Staff: Kathleen Crowley, Marianne McCartney, Chris Pitoscia, Pam Shively
Please share questions or comments with us at **newsfeedback@columbia.edu**