

E·O·H·S·S

Environmental & Occupational
Health & Safety Services



A Newsletter for the UMDNJ Laboratory Community

Update

On-line training now available for your convenience!

Laboratory personnel now have a choice about how they can fulfill their retraining requirements. EOHSS has developed an on-line module and quiz as an alternative to "classroom" refresher or update training. EOHSS will continue to offer initial training in a "classroom" setting.

Currently, the on-line module is available for personnel on the Piscataway/New Brunswick campuses. It will be available University-wide starting April. The web address is: <<http://www2.umdnj.edu/eohssweb/labsafety/start.htm>>.

The module covers Laboratory Safety, Right to Know compliance and Chemical Waste Management. Refresher training for Laboratory Safety and Right to Know compliance is required every other year.

Training for lab personnel who manage chemical waste is required annually. Typically, EOHSS does "On the Spot" training for laboratory

personnel as they bring their chemical waste to the Chemical Waste Room. This year it was decided to train all lab personnel about chemical waste management to help UMDNJ avoid the costly fines that other Universities have faced.

EOHSS will contact Responsible Investigators and Lab Safety Officers with the names of lab personnel who are up-to-date on their 1999 training requirements.

Recent Incidents

Former UMDNJ graduate Student Burned in a Laboratory Fire

The author of the following letter is a former UMDNJ graduate student now working as a postdoc at another institution. It was forwarded to EOHSS by one of his former colleagues at the CABM. The names of the people involved have been changed.

Hey Tony,
I've been trying to email you for some time but the computer wouldn't let me through for some reason - hope

we have better luck now. I wanted to tell you some news in the meantime - I was in a serious lab accident here in John's lab and was quite badly hurt. Before I relate the rest of the tale (it is quite frightening) let me assure you that I am basically OK, I'm not disabled or horribly disfigured or anything.

What happened is there was an explosion and fire in the lab in which I was actually set on fire and badly burned Friday afternoon September 11th. This lab technician was working at her bench with a burner going full blast; John and I were standing about 6 feet away. She proceeded to pour from a full one gallon glass bottle of methanol with the mouth of the bottle only a few inches from the flame. John and I stared in horror at the stupidity of the action; I took a few steps toward her as I told her to stop what she was doing and get the bottle away from the flame ASAP, about to give her the safety lecture of her life.

The whole thing exploded in my face; all I saw was a ball of blue flame as the entire bay was drenched with burning methanol. It was like I was hit by a flamethrower - I looked down and flames were coming from my chest and arms. The whole episode only lasted for 5 or 10 seconds before I got under the emergency shower (thanks

to cool thinking by John, who basically saved my life). I was burned over about 20% of my body surface - a mixture of 1st, 2nd, and 3rd degree burns on my chest, left side, left arm and hand, right forearm, the front of my neck, and the bottom half of my face. The sprinkler system extinguished the rest of the fire. No one else was hurt - the person who was responsible left the next day for another position so I couldn't even have the pleasure of firing her.

I spent 10 days in the Hospital Intensive Care Unit, and had skin graft surgery to repair the worst of the burns. There are whole days of my time in the ICU that I have no recollection of, but what I remember was a nightmare.

But in the end I walked out of the hospital on my own two feet. The good news is the burns to my face and neck were very superficial so they healed up nicely. I'll have no scarring there - with a long sleeved shirt on you'd never know anything had happened to me (in fact I look even better after the accident - the facial burn was like having a chemical face peel, and I lost around 15 pounds in the hospital plus I have a new spiky punk haircut from when the ICU nurse cut away all of my burned hair, so people at first think I went to a spa or something). My chest and left arm are a different story - I'll definitely have some scarring there but it's too early to tell what it will look like. Considering how easily I could be dead/blind or horribly disfigured I consider myself very lucky indeed. Five weeks after the accident I was back at work.

So now I preach lab safety to everyone I talk to. Tell your people to be careful with flammable solvents and remember what I learned the hard way - it doesn't matter how

careful you are, someone else's stupidity can get you killed.

Dan

Centrifuge Explosion Damages Cornell University Laboratory

The following was adapted from an article posted on the Cornell Environmental Health and Safety Web Page: <<http://www.ehs.cornell.edu/LRS/CentrifugeSafety/CentrifugeDamages.html>>

A laboratory at Cornell University was seriously damaged in December 1998 when an ultracentrifuge rotor failed. The explosion destroyed the centrifuge, a Beckman L2-65 B, and flying metal fragments ruined a nearby refrigerator and freezer. The walls and ceiling were also damaged by airborne debris and the windows were blown out. The centrifuge was propelled sideways, damaging cabinets and shelving. Milk samples had been running for approximately one hour when the explosion occurred. The rotor had been used for this procedure often. Fortunately the room was not occupied and no one was injured.

It is believed that the rotor was not listed by the manufacturer as approved for use in the L2-65B.

Preventing Centrifuge Accidents

- Only use rotors approved for the centrifuge. Beckman centrifuges should have a decal specifying the rotors that can be used in that model. If you have any questions regarding which rotors can be used, contact the vendor.

-Before a rotor is used, check whether the proper O-rings are on

the lid and/or buckets. The absence of an O-ring can result in a loss of vacuum or rotor imbalance.

-Rotors need to be derated (i.e., the maximum allowable running speed reduced) over time. Using a rotor that has not been properly derated can lead to the type of failure experienced at Cornell. The extent of derating is based on the amount of previous use. Operators must maintain a comprehensive log for each rotor, as explained in the operating manual.

-Additional derating is necessary when centrifuging dense solutions, CsCl gradients, or when using heavy tubes.

-Rotors must be used with the correct overspeed device. Use of an overspeed device that allows the rotor to be run at excessive speeds can lead to centrifuge failure.

- Rotors showing signs of wear or damage (e.g., corrosion or a bent bucket) and centrifuges that are not operating properly must be taken out of service and checked by an authorized service representative. Clearly mark such devices with: "DANGER - DO NOT USE."

- Older equipment does not have all of the built in safety features of the newer units and are more likely to experience rotor failures. Follow all safety and maintenance procedures specified by the manufacturer.

- Responsible Investigators must ensure that centrifuge operators are properly trained on how to select, load, balance, and clean the rotor. Contact the manufacturer's service representative to obtain the operating manual if one is not available. The Howard Hughes Medical Institute has produced an excellent 10 minute videotape on centrifuge safety. Tapes can be ordered free of charge from their web site: <<http://www.hhmi>>

org/science/labsafe/videos.htm> or you can borrow a copy from your campus EOHSS office.

Sorvall centrifuges and their compatible rotors and tubes are described at: <<http://www.sorvall.com/guide/guide.htm>>. Call 1-800-877-4626 to obtain a replacement copy of Beckman's *Rotors & Tubes for Preparative Ultracentrifuges: An Operator's Manual*.

Note: Beckman and Sorvall provide annual rotor and centrifuge inspections for equipment under contract. The RWJMS Shared Equipment Services (732-235-4455) will help personnel with the names of vendors who can inspect and maintain models not currently under contract.

Unlabeled Freezer

Recently, a freezer shared by several Michigan State University laboratories failed. The absence of a hazard label and emergency contact information required that a clean up be done by a hazardous materials response team. The team found virus samples, tissue specimens, unlabeled culture tubes, a radio labeled sample, and cracked and broken flasks of animal serum—all floating in liquid of "questionable origin." The freezer was in an unsecured area and was unlocked.

Such inattention to detail can jeopardize a colleague's or your own health. Use the following storage practices when using equipment shared with others:

- Label and store all radioactive materials in secure areas that can only be accessed by authorized personnel.
- Label all containers with the contents, responsible person, and hazard label if appropriate. When

storing human serum, you have the option of using a label with the universal biohazards symbol on the primary container, the secondary container, or the outside of the freezer.

- Establish an inventory for materials stored in common areas and update it regularly.
- Check storage areas periodically to insure that controls are functioning properly.

Consult *Protocol for Vacating a Laboratory*, Appendix F of the UMDNJ Laboratory Safety Plan to ensure the safe removal of hazardous materials from laboratories that are being vacated.

US Army Cited for Failure to Dispose of Mercury within Required Time

On October 13, 1998, the U.S. Environmental Protection Agency filed a complaint against the U.S. Army for violating federal and state hazardous waste rules at Fort Belvoir, Fairfax County, Virginia. The administrative complaint alleged that the Army failed to dispose of a discarded manometer filled with mercury timely. In addition, the Army also allegedly failed to track a shipment of hazardous wastes from the base in May 1996 properly. They cited the Army under the Resource Conservation and Recovery Act, the principal federal statute regulating the treatment, storage, and disposal of hazardous waste.

This case is interesting from the point of view of disposing equipment that contains a hazardous material. In most states, the metallic mercury could have been collected and sent for reclamation as a contaminated product, not a Hazardous Waste.

This was a complaint, not a final decision. Both violations were corrected before the EPA filed their complaint. The EPA was seeking a \$25,490 penalty for these violations.

UMDNJ laboratories with unwanted equipment containing hazardous materials such as mercury or oil should contact EOHSS for assistance.

Book Review

Ship Fever

by Andrea Barrett

(Review by Kyle SanGiovanni,
EOHSS)

This 1997 National Book Award Winner combines historical scientific fact with fiction in a brilliantly original way. It is a collection of eight short stories, inspired by the lives of doctors, inventors, and adventurers, portraying their ambitions and passions. The author has a knack for meshing hard science with the strangeness of fiction. Ms. Barrett has captured the isolation and drive required of curious minds on the edge of scientific discovery.

My favorite, the title story, will shock and devastate you. The struggles of the young Canadian doctor, treating Irish immigrants fleeing to the new world to escape the Great Famine, only to encounter an equally tragic epidemic, stayed with me well after reading the story.

If you are looking for something different under the heading fiction, then this well written collection is sure to move and motivate you.

At Home

On February 24, 1999, the New Jersey Department of Environmental Protection inspected the Piscataway campus for compliance with hazardous waste management regulations. We are pleased to report that the inspection went smoothly with no violations noted. Thanks to all of the laboratory hazardous waste managers for their diligent efforts!

Regulatory Update

"Safe Needle" Legislation

This past December, California's Occupational Safety and Health Standards Board adopted regulations designed to prevent needlestick injuries among healthcare workers. By August 1, 1999, all healthcare employers must adopt "needle-less systems" or needles with built in features that blunt or encapsulate needles, or otherwise reduce the chance of an accidental needlestick. Institutions not adopting these measures will have the burden of proving that such devices compromise patient safety, adversely affect treatment outcomes, or do not decrease the risk of a needlestick compared with a conventional device.

The new regulation is expected to result in a fourfold reduction of needle sticks among California healthcare workers. Nationally, 600,000-1,000,000 needlesticks occur yearly. OSHA estimates that between 560 and 1,120 health care workers were infected with Hepatitis C in 1993 as the result of occupational exposures, mostly percutaneous injuries caused by needle sticks. Eight hundred healthcare workers are occupationally infected with Hepatitis B every year and the CDC has documented 54 confirmed cases of occupational HIV transmission. The actual impact is likely greater because occupational injuries historically have been under reported.

Action on needlesticks has not been limited to California. On the federal level, Congress has directed OSHA to change their injury reporting criteria to include all accidents involving potentially contaminated "sharps," not just incidents requiring medial attention beyond first aid. OSHA has requested public comments on strategies for minimizing needlesticks, apparently with an eye toward the promulgation of new directives in this area.

For more information go to: < <http://www.osha-slc.gov/SLTC/needlestick/index.html>>. This is an OSHA web site with links to background material and training information on preventing occupational needlestick injuries.

Visit the EOHSS website at:
<http://www2.umdnj.edu/eohssweb/eohss.htm>



The Department of Environmental and Occupational Health and Safety Services (EOHSS) provides support to the University community through the development and implementation of health and safety programs. Some of the key areas in which EOHSS provides assistance are: hazard evaluation and control, consultation and technical assistance, safety education and training, hospital safety, fire/life safety, emergency chemical spill response, chemical waste management, and laboratory safety. Contact EOHSS at:

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BenchSmart is published quarterly by the Department of EOHSS for UMDNJ laboratory personnel. This newsletter will address current and relevant laboratory health and safety information for the research community. If you have any comments, would like to submit an article, or would like to have us address a particular topic, please contact Lindsey Kayman, CIH, at (732) 235-4058 or by e-mail at kayman@umdnj.edu or contact Paul Rubock, MPH, at (973) 972-4812 or e-mail rubockpa@umdnj.edu.