Research Safety Officers
Refresher Training
Fall 2011

October 6, 2011
Environmental Health & Safety
University of Minnesota
Research Safety Update

Craig S Moody

Department of Environmental Health & Safety

University of Minnesota
AHC Review and OHS

- OHS established in AHC in 2006
- AHC Executive Steering Committee Report
  - [http://blog.lib.umn.edu/ovprcomm/ahcreview/](http://blog.lib.umn.edu/ovprcomm/ahcreview/)
  - Comment period extended to 10/14/11
AHC Steering Committee
Recommendations

- Transfer Office of Occupational Health and Safety to Vice President for Human Resources
- Govern OHS Office by Occupational Health and Safety Steering Committee
- VP Human Resources as Committee Chair
Research Safety Program

- No specific recommendations on oversight and structure of Research Safety Program within OHS
- VP Human Resources intends to conduct search for Director - OHS
Recommendations from 2009

Research Safety Work Group

- Use OHS Steering Committee as the overall governing body for research safety.
- Create research safety advisory committee, as a technical advisor to the OHS Steering Committee and research safety program.
- Create a committee on chemical and physical hazards to advise on high hazard safety matters, including review and approval of SOPs for high hazard operations and materials.
Establish a University-wide Research Safety Program in the Occupational Health and Safety Office, headed by a program director with a staff of Research Safety Professionals:

- A core staff of 5 to 6 Research Safety Professionals, each assigned to a specific set of colleges
- The Research Safety Professionals to have a close working relationship with the Associate Deans of Research in the colleges assigned to them.
Recommendations of 2009 Research Safety Work Group

- Make academic chain of command responsible for safety: starting with the PI or research supervisor and then, department heads, associate deans of research, and deans.
- Associate Deans of Research to assume the lead role in colleges for research safety programs
- Create collegiate safety committees
Why Training

- By far the most important aspect of safety
- Reduces injury/illness
- Increases awareness and efficiency
- Required for compliance but more so for your own safety

YOUR SAFETY IS OUR PRIORITY
The goal of the University of Minnesota's Research Safety Program is to assure that research is carried out in a way that:

- prevents accidents and minimizes exposure to hazardous agents and conditions;
- prevents degradation of the environment through responsible waste management and active waste reduction;
- conserves resources and minimizes losses;
- and achieves regulatory compliance.
Review of compliance basics

- Keep your fume hoods clean
- Use proper secondary containment for chemical waste storage
- All chemicals must be labeled appropriately
- Same for fridges and freezers where toxic/hazardous chemicals are stored
- Maintain an inventory of current chemicals in use
- Try to dispose of older chemicals as waste
Review of compliance basics

- Sharps and biohazard containers must be properly labeled with the biohazard symbol
- DO NOT recap sharps
- Call hazardous waste when sharps containers are \( \frac{3}{4} \) full, do not fill them all the way to the top
- Call hazardous waste if chemicals are unknown
Review of compliance basics

- Watch for proper lab attire
- No sandals
- Cover all exposed skin (hands/legs)
- Eye protection
- No gloves or lab coat in public spaces
- No food or drink in laboratories
- Identify safety equipment
- Flush eyewashes once a week and record
Review of compliance basics

Choose the right protective equipment for the job!!
Lab Safety Plan Update

Jennifer Borgert

PARTMENT OF ENVIRONMENTAL HEALTH & SAFETY

UNIVERSITY OF MINNESOTA
Lab Safety Plan

The Department of Environmental Health and Safety (EHS) ensures the safety of the University of Minnesota community. We work with our community members to prevent accidents, report unsafe conditions and protect the environment.

Services

Environmental Health and Safety provides consulting services, training and outreach for all University community members. We create and maintain policies and procedures that support the University of Minnesota's commitment to health and safety standards. Our primary goal is to prevent accidents and protect the environment.

Quick Answers

Main Office:
University of Minnesota
W-140 Boynton Health Services
410 Church Street SE
Minneapolis, MN 55455
Phone: (612) 626-6002
Fax: (612) 626-1949
Mailcode: 1174
email: dehs@umn.edu

Thompson Center:
University of Minnesota
501 - 23rd Avenue SE
Minneapolis, MN 55455
Phone: (612) 626-1504
Fax: (612) 626-1571
Mailcode: 2681
email: hazwaste@umn.edu

Resources

MSDSs
Forms
Manuals
Training

Downloadable Word Version of the Laboratory Safety Plan

Appendices

Laboratory Safety Plan

Health and Safety Resources

Controlled Substances

RSO Training

RSO Contact List

Laboratory Safety Forms

MSDSs

Creating a safe and healthy environment at the local, state and federal level.
LSP Update

- Updated template of the Lab safety plan will be available on the DEHS website
- Downloadable word version will be available
LSP Update

- HealthPartners Occupational and Environmental Medicine is the provider for occupational health services for University employees in the twin cities. Health Partners has 3 clinic locations around the Minneapolis and St.Paul campuses.

- The HealthPartners 24 hour CareLine phone service is available any time. The CareLine is staffed with registered nurses who can counsel employees on where to seek care in the event of an exposure. Call 612-339-3663 or 800-551-0859 (TTY 952-883-5474).
Training Reminder and Record keeping

Robin Tobias
Environmental Health & Safety
University of Minnesota
Overview of Training Responsibilities

- Training Options
- Recordkeeping
- Resources
- New Lab-Specific Training Document
Refresher Training: Options

- Host department wide sessions
  - Base content on results of lab audits
  - EHS staff may participate as topic speakers
  - Supplement with a.v. materials if desired.

- PIs may hold small group or lab sessions on a regular basis to fulfill requirements

- Direct staff to online training for new or recurring training (must be supplemented by supervisor)

- As a last resort, use EHS web-based initial-training modules
Record keeping

To check departmental records of training, go to http://www.umreports.umn.edu/
- Log in, go to HR Reports, then to Training History
- choose your college/admin unit;
- check “all reports” and completed training
- May download results to an Excel Spreadsheet and sort for “EHxxxx” courses

To check individual’s training status, go to http://www.umreports.umn.edu/
- Log in, go to HR Reports, then to Training History
- choose ‘Type and Emplid’ and enter number;
- check “completed”,
- Status date vs. course start date
Record Keeping: in PeopleSoft

- Contact Carolie Carlson
  carls139@umn.edu
  612-626-1349

- Services
  - set up courses (for larger groups)
  - register attendees
Record keeping: self reporting

- Appropriate for small group sessions (lab-specific topics)
- To self-report training in PeopleSoft
  - Go to Human Resources Self Service
    http://hrss.umn.edu/
  - Click ‘Training Registration/History’
  - Click ‘Personal Training Record’
  - Click ‘Self-Reported Training’ to enter new info
Training Resources

- Expansion of available training tools
  - Topic specific PowerPoint presentations
  - Simplifying the DEHS Training Website
- Training Examples
  - PowerPoint example for RSOs
  - Attend other Department’s trainings
- SOP Examples
- Lab Specific Training Document
Lab Specific Training Document

- Serves as a guide PIs and Lab Managers as to the content they should be covering
- Serves as documentation
- Can be used for annual training and new hires

Lab Specific Training Log
Lab Wars

- Watch the movie and write down as many safety violations as you can find
  - http://www.esdi.us/research/lab-safety/
Quiz

Monika Vadali
What’s wrong with this picture?

- Equipment left unattended in hallway
- Safety equipment used as door stop
What’s wrong with this picture?

- Consumables stored with chemicals
What’s wrong with this picture?

- HINT: Biosafety Cabinet. Note: Bunsen Burner on right.

- An open flame device, such as a standard Bunsen burner, is used in a manner that may potentially result in fire and/or decrease the capture efficiency of a recirculation biosafety cabinet.
What’s wrong with this picture?

- Flammable liquids not stored in closed containers
What’s wrong with this picture?

- Incompatible gases (propane and oxygen) in cylinders are not STORED at least 20 feet apart.
What’s wrong with this picture?

- Exit corridors must be free of obstructions
What’s wrong with this picture?

- Electric panel and breaker boxes must be easily accessible
What’s wrong with this picture?

- Portable fire extinguisher has to be securely installed on the wall, in the bracket supplied by the manufacturer.
What’s wrong with this picture?

- Cylinders not properly secured to a non mobile source
- Fire extinguisher not visible or easily accessible
- Door that should be closed is open
Flammable liquids like Acetone that require refrigeration must be stored in a flammable liquids refrigerator or freezer with specific design requirements.
Chemical Waste and Security Update

Andy Phelan, Gene Christenson, Brian Brosnan
Hazardous Waste Update

- Dale Cardwell, operations manager, retired in July and we are going leaner
  - Let us know if you see gaps
- No HW lab inspections this year, as Chemical Security inventory required focus
- Will begin programming our online request form in January
- Andy Phelan is retiring in January – it’s been a privilege working with RSOs
## Autoclave Indicator Tape

<table>
<thead>
<tr>
<th><strong>Use</strong></th>
<th><strong>Lead</strong></th>
<th><strong>HW ?</strong></th>
<th><strong>Management</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Integral chemical system indicates [color change or text appearing] that specific external temps are reached in autoclave process.</td>
<td>Older tapes have a lot of lead. Newer 3M tapes manage lead to allow solid waste disposal.</td>
<td>Tape alone, unless known to be non-lead, is D008 HW. Optimized amount of tape combined with bag/wrap is non-HW.</td>
<td>Tape alone: If Pb is present or Pb concentration is unknown, collect for HW management. Non-lead tape manage with solid waste. Bag/wrap with tape: manage with solid waste.</td>
</tr>
</tbody>
</table>

*Environmental Health & Safety*
Non-Lead Autoclave Indicator Tape available at UStores:

Fisher Scientific

- Lead and Latex Free ¾”  
  Part Number: 235-6244
- 500L x 0.5 in. W; 6 rolls/box  
  Part Number: 1599912A
- 500L x 0.75 in. W; 4 rolls/box  
  Part Number: 1599934A
- 500L x 1 in. W; 3 rolls/box  
  Part Number: 15999100A
- 60 yd. L x 0.5 in. W  
  Part Number: 1599912B
- 60 yd. L x 0.75 in. W  
  Part Number: 1599934B
- 60 yd. L x 1 in. W  
  Part Number: 15999100B
Chemical Security

- Dept of Homeland Security requires monitoring of “Chemicals of Interest” and reporting if exceed thresholds.
- As reports of exceedances must be made within 60 days, we can require regular inventory updates or create a baseline and monitor purchases.
- We chose the latter as less time and effort by labs, but we need to address workarounds.
Chemical Security

- We have (almost) completed the baseline inventory: thanks to the RSOs for prodding your research groups
- We are now monitoring purchases through EFS for purchases through U Stores front end and will soon be approving such purchases
- We will be directing our major vendors to accept orders only through EFS/U Stores
No COI Purchases with P-Cards!

- We have the full support of the VP Research
  - See Memo from VP Mulcahy
- Posters and memo will be mailed to all those who use P-cards for chemicals and to all labs which presently have COIs
- Please help us get the message out
- http://www.dehs.umn.edu/envircomp.htm
<table>
<thead>
<tr>
<th>Solids and Liquids</th>
<th>Solids and Liquids</th>
<th>Gas Cylinders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum (powder)</td>
<td>Nitrocellulose</td>
<td>Arsenic</td>
</tr>
<tr>
<td>Ammonium nitrate, (with 0.2% combustible)</td>
<td>Nitroglycerine</td>
<td>Boron tribromide (if in cylinder)</td>
</tr>
<tr>
<td>Ammonium nitrate, solid (23% Nitrogen)</td>
<td>Nitromannite</td>
<td>Boron trichloride</td>
</tr>
<tr>
<td>Ammonium perchlorate</td>
<td>Nitromethane</td>
<td>Boron trifluoride (conc. of at least 26.87%)</td>
</tr>
<tr>
<td>Ammonium picrate</td>
<td>Nitrorestance</td>
<td>Bromine chloride</td>
</tr>
<tr>
<td>Arsenic trichloride</td>
<td>Nitrotoluol</td>
<td>Bromine trifluoride (if in cylinder)</td>
</tr>
<tr>
<td>Barium oxide</td>
<td>Nitrotoluene</td>
<td>Carbonyl fluoride</td>
</tr>
<tr>
<td>Bis(2-chloroethylthio)methane</td>
<td>O-O-Diethyl S-5-</td>
<td>Carbonyl sulfide</td>
</tr>
<tr>
<td>1,4-Bis(2-chloroethylthio) n-butane</td>
<td>(2-diethylamino)ethylphosphorothioate</td>
<td>Chlorine (conc. of at least 0.77%)</td>
</tr>
<tr>
<td>1,5-Bis(2-chloroethylthio) n-pentane</td>
<td>Octoilte</td>
<td>Chlorine trifluoride</td>
</tr>
<tr>
<td>1,3-Bis(2-chloroethylthio) n-propane</td>
<td>Octene</td>
<td>Cyanogen</td>
</tr>
<tr>
<td>Bis(3-chloroethyliothio)methanethiol</td>
<td>O-Mustard (T)</td>
<td>Cyanogen chloride</td>
</tr>
<tr>
<td>Boron tribromide (conc. of at least 12.67%)</td>
<td>Pentolite</td>
<td>Diborane</td>
</tr>
<tr>
<td>Bromine trifluoride</td>
<td>PETN</td>
<td>Dichlorosilane</td>
</tr>
<tr>
<td>2-Chloroethyldichloro-methylsulfide</td>
<td>Phosphorus oxochloride (conc. of at least 80%)</td>
<td>Dinitrogen tetroxide</td>
</tr>
<tr>
<td>Chlorosarín</td>
<td>Phosphorus trichloride (conc. of at least 3.48%)</td>
<td>Fluorine</td>
</tr>
<tr>
<td>Chloroserman</td>
<td>Picric Acid (aka Trinitrophenol)</td>
<td>Germane</td>
</tr>
<tr>
<td>DE</td>
<td>Picric</td>
<td>Germanium tetrafluoride</td>
</tr>
<tr>
<td>Diazodinitrophenol</td>
<td>Potassium perchlorate</td>
<td>Hexaethyl tetraphosphate mixtures</td>
</tr>
<tr>
<td>Diethyl methylphosphonite</td>
<td>Potassium nitrate</td>
<td>Hexafluorocarbene</td>
</tr>
<tr>
<td>Diethylmethylglycol dinitrate</td>
<td>Potassium permanganate</td>
<td>Hydrogen bromide (anhydrous)</td>
</tr>
<tr>
<td>DINGU</td>
<td>Propylphosphonothioic dichloride</td>
<td>(conc. of at least 16.67%)</td>
</tr>
<tr>
<td>Dinitropheol</td>
<td>Propylphosphonyl difluoride</td>
<td>Hydrogen chloride (anhydrous)</td>
</tr>
<tr>
<td>Dinitrosorcinol</td>
<td>QL</td>
<td>Hydrogen cyanide</td>
</tr>
<tr>
<td>Dipicryl sulfide</td>
<td>RDX</td>
<td>Hydrogen fluoride (anhydrous)</td>
</tr>
<tr>
<td>Dipicrylamine (or) Hexyl</td>
<td>RDX and HMX mixtures</td>
<td>Hydrogen iodide, anhydrous</td>
</tr>
<tr>
<td>Ethyl phosphonyl difluoride</td>
<td>Sarin</td>
<td>Hydrogen selenide</td>
</tr>
<tr>
<td>Ethylmethylamine</td>
<td>Ethylphosphonothioic dichloride</td>
<td>Hydrogen sulfide (conc. of at least 23.73%)</td>
</tr>
<tr>
<td>Guanyl nitrosamine, guanylidene hydrazine</td>
<td>Isopropylphosphonothioic dichloride</td>
<td>Methyl mercaptan</td>
</tr>
<tr>
<td>Hexaethylbenzene</td>
<td>Isopropylphosphonyl difluoride</td>
<td>Methylchlorosilane</td>
</tr>
<tr>
<td>Hexolite</td>
<td>Lead azide</td>
<td>Nitric oxide</td>
</tr>
<tr>
<td>HMX</td>
<td>Lead styphnate</td>
<td>Nitrogen trioxide</td>
</tr>
<tr>
<td>HN (nitrogen mustard-1)</td>
<td>Lewkite 1</td>
<td>Nitroyl chloride</td>
</tr>
<tr>
<td>HN2 (nitrogen mustard-2)</td>
<td>Lewkite 1</td>
<td>Oxygen difluoride</td>
</tr>
<tr>
<td>HN3 (nitrogen mustard-3)</td>
<td>Lewkite 1</td>
<td>Perchloryl fluoride</td>
</tr>
<tr>
<td>Hydrogen peroxide (concentration of at least 35%)</td>
<td>Lewkite 1</td>
<td>Phosgene</td>
</tr>
<tr>
<td>Isopropylphosphonothioic dichloride</td>
<td>Lewkite 1</td>
<td>Phosphine</td>
</tr>
<tr>
<td>Isopropylphosphonyl difluoride</td>
<td>Lewkite 1</td>
<td>Phosphorus trichloride (if in cylinder)</td>
</tr>
<tr>
<td>Lead azide</td>
<td>Lewkite 1</td>
<td>Selenium hexafluoride</td>
</tr>
<tr>
<td>Lewkite 1</td>
<td>Lewkite 1</td>
<td>Silicon tetrafluoride</td>
</tr>
<tr>
<td>Lewkite 1</td>
<td>Lewkite 1</td>
<td>Stilbene</td>
</tr>
<tr>
<td>Lewkite 1</td>
<td>Lewkite 1</td>
<td>Sulfur dioxide (anhydrous) (conc. of at least 84%)</td>
</tr>
<tr>
<td>Lewkite 1</td>
<td>Lewkite 1</td>
<td>Sulfur tetrafluoride</td>
</tr>
</tbody>
</table>

Chemicals in RED are the ones mostly likely to be ordered.
Biosafety Update

Betty Kupskay
DEHS Website - Biosafety

- Biosafety Manual
- Answers to Frequently Asked Questions
- Biosafety Lab Visits
- Fact Sheets
- Waste Handling Information
- Training
- Blood Borne Pathogens
- Shipping Biological Material
- Biosafety Resource Links

http://www.dehs.umn.edu/bio.htm
Biosafety Manual

Includes*:

- Autoclave Safety & Effectiveness
- Biological Safety Cabinets
- Biological Toxins
- Decontamination & Disinfectants
- Risk Assessment
- Select Agents
- Sharps Usage
- Standard Operating Procedures (SOPs)

* Not an exhaustive list
Researchers working with human blood or body fluids, or other infectious agents must:

- follow the university’s **Exposure Control Plan**
  http://www.dehs.umn.edu/PDFs/exposecontrol-plan.pdf

- complete **Bloodborne and Other Pathogens Training**
  online  http://www.dehs.umn.edu/bio_pracprin_blood_bpt.htm
Institutional Biosafety Committee (IBC)

Researchers working with:

- Recombinant DNA, Artificial Gene Transfer
- Infectious Agents (bacteria, viruses, fungi, prions, etc.)
- Biologically Derived Toxins
- Select Agents
  - must register with the CDC (contact DEHS)
Biosafety Tips – IBC applications

- Use SOP template for work with infectious agents at http://www.dehs.umn.edu/PDFs/writingSOP.pdf

- Biosafety Officer available for SOP consult

- Ensure that all information in SOP matches info on Decontamination & Biowaste Templates

- 1:9 (v/v) solution of household bleach = 10% bleach

- Contact time is 30 minutes for bleach/ethanol
Biosafety Tips – IBC applications

- A BSC is NOT the same as a Laminar Flow Hood, or Tissue Culture Hood

- Biological toxin work must be done in a BSC (fume hood may be in special circumstances after risk assessment)

- Unfixed cell sorting of BSL2 agents must be done in a BSL2 facility (e.g. 2-419 MTRF, 1340 Mayo)
Institutional Animal Care & Use Committee (IACUC)

- Reviews all projects involving animals
- Ensures that experiments are justified by their benefits & minimize any animal pain or suffering
- Includes research teaching & display of UM-owned animals
- Must have IACUC approval before research animals may be ordered
Biosafety Laboratory Visits

- Self-inspection form to be completed by PI/lab manager before inspection
- All lab personnel to sign off on self-inspection
- Annual visit by DEHS Biosafety Specialist
- DEHS Biosafety Specialist will review SOPs prior to visit
Biosafety Training

- Biological & Infectious Waste
- Decontamination
- Biological Toxins
- Biological Safety Cabinets or Fume Hoods - Which one to Use?

Available in-person for groups of 15 or more
Biosafety Unit - DEHS

- Betty Kupskay, Biosafety Officer

- Biosafety Specialists:
  - Claire Kari
  - Xiaohong Chen
  - Robin Tobias

Call us at (612) 626-6002
Radiation Safety Update

Brian Vetter
Radiation Safety Services

- Training
  - online at www.dehs.umn.edu
  - In-person refresher training
- Emergency Response
- Materials Management
  - Transfers
  - Orders
  - Waste
- Licensing & Safety
  - Permits
  - Audits/Record Keeping
  - Dosimetry
  - Informational Literature
Radiation Safety Services

- Training
  - online at [www.dehs.umn.edu](http://www.dehs.umn.edu)
  - In-person refresher training
- Emergency Response
  - Call 6-6002, DEHS during regular business hours
  - Call 911, UMPD dispatch after hours, weekends & holidays
  - “*Put it away when you are done with it.*”

Properly sealing and storing items, including stock material, working solutions, supplies and waste products will minimize chances of creating an even bigger mess when outside forces come calling.
Radiation Safety Services

- Training
  - online at www.dehs.umn.edu
  - In-person refresher training
- Emergency Response
- Materials Management
  - Transfers
    - Lab Move Procedure: Time tested, efficient and effective
  - Orders
  - Waste
- Licensing & Safety
  - Permits
  - Audits/Record Keeping
  - Dosimetry
  - Informational Literature – Regulatory Guides, Right-to-know info., etc.