CHEMICAL SAFETY COMMITTEE
AGENDA
March 29, 2012
12:30 - 2:00 PM
Rudman Hall G79

1. Introduce Chemical Safety Committee Members, Staff, and Guests
2. Approve Last Committee Meeting Minutes
3. Chemical Inventory Updates (Ken Brown)
4. Hazardous Waste Updates (Marty McCrone)
5. Development of a Compliance and Risk Management Module for Faculty (Brad Manning)
6. US Chemical Safety Case Study of Texas Tech University Laboratory Explosion (Andy Glode)
7. Draft UNH Hazardous Materials Management Plan (Brad Manning)
8. Laboratory Safety Updates (Andy Glode)
9. New Business
10. Next Meeting (Date/Time)
11. Adjourn

The Chemical Safety Committee (CSC) was created to assure the safe acquisition, use and disposal of all hazardous chemicals at the University of New Hampshire (UNH). It is the responsibility of the CSC to establish appropriate health and safety policies in accordance with federal, state, and local regulations and guidelines that cover chemical safety and evaluate research being conducted at UNH for chemical safety considerations.

For more information about the UNH Chemical Safety Committee, please visit http://www.unh.edu/research/chemical-safety-committee-0
MINUTES
March 29, 2012
12:30 – 2:15 PM
Kingsbury Hall, W290

Voting Members Present

Andy Glode Office of Environmental Health and Safety
Scott Greenwood Environmental Research Group
Bill McDowell Natural Resources and the Environment
Lee Jahnke Biological Sciences
Janet Poff Molecular, Cellular and Biomedical Sciences
Cindi Rohwer Chemistry
Cheryl Whistler Molecular, Cellular and Biomedical Sciences, Committee Chair

Ex-Officio Voting Members Present

Brad Manning Office of Environmental Health and Safety

Ex-Officio Non-Voting Members Present

Marty McCrone Office of Environmental Health and Safety

Ex-Officio Non-Voting Members Absent

Julie Simpson Research Integrity Services
Victor Sosa Office of Sponsored Research

Voting Members Absent

Clyde Denis Molecular, Cellular and Biomedical Sciences
Thomas Harris Chemistry
Linda Kalnejais Earth Sciences
Sarah Kenick UNH Manchester
Xiaowei Teng Chemical Engineering
1. **Introduce CSC Members, Staff, and Guests**

Cheryl Whistler called the meeting to order at 12:45 PM. Chemical Safety Committee (CSC) members were introduced. Eight of the thirteen voting members were present. Therefore, the membership did constitute a quorum (>50%).

2. **Approve Last Committee Meeting Minutes**

Member Greenwood made a motion to accept the minutes; motion seconded by member Poff. The motion to accept the minutes was accepted unanimously.

3. **Chemical Inventory Updates**

Ken Brown provided a written update to the committee regarding chemical inventory initiatives; this update is attached. Member Glode read the updates and showed examples of the new scanning hardware to the committee.

4. **Hazardous Waste Updates**

Member McCrone updated the committee on recent waste cleanouts in Parsons. They managed an unknowns service in Parsons and finished cleanouts in the North wing. They are anticipating supporting the move-outs from the SE wing into the North wing. Member Rohwer mentioned the move into the North wing will occur in June and July.

Marty McCrone, Jeff Anderson, and Michele Arista from the Office of Environmental Heath and Safety toured campus hazardous waste Satellite Accumulation Areas (SAA) with representatives of Harriman and Associates, UNH FD&C, and Triumvirate Environmental. FD&C is acquiring proposals from vendors for alternative management of hazardous waste on campus as an alternative to the capitol expense of building a new hazardous waste Central Accumulation Area.

The NH Department of Environmental Services or EPA will likely perform a hazardous waste inspection at UNH in 2012. UNH is required to be inspected every five years and our last inspection was in 2007. Member McCrone has created new SAA postings which have been distributed to many laboratories, example postings were shared with the committee, see attached. Also, OEHS created a Safety Note which is distributed with chemical deliveries which notifies labs of the impending inspection, also attached. Member McDowell suggested that the message about the inspection should be distributed to department chairs or directly to faculty. Member Jahnke supported this comment and said that he could discuss it at his next faculty meeting. Several members agreed this was a good idea. Member McCrone agreed to forward information about the upcoming inspection to committee members.

5. **Development of a Risk Management Module for Faculty**

Member Manning described ongoing discussions stemming from reorganization efforts within the Research Office for development of a Risk Management Module that could be developed to minimize impacts of increasing compliance requirement on faculty, staff, and students. The module would be an in-depth training system which would train staff and students in all of the areas of safety and compliance which they may require at UNH. The module would train
students and staff in topic areas required by the Institutional Biosafety Committee, the Radiation Safety Committee, Institutional Animal Use and Care Committee, the Laboratory Safety Program and others. By giving extensive training in all major areas of safety and compliance across-the-board, the burden of accommodating training schedules into research work is shifted away from lab managers and PIs. There would be no charge to the faculty for the training module.

Member Whistler asked how the system would prompt faculty members for information about their work. She has found out about regulatory requirements after submitting protocols for review, instead of knowing in advance that a particular technique or activity would result in additional compliance requirements. Member Manning responded that protocol review is a standard way of identifying regulatory requirements but that perhaps the system could be organized in such a way as to help faculty members to anticipate compliance requirements.

Member Rohwer responded that perhaps requirements could be more clearly discussed during new faculty orientation. Member Whistler stated that she did not attend an orientation because her start date did not correspond with an orientation date. Member Manning added that this could help make a stronger case for including the compliance module as a component to new faculty and staff orientation.

Member Manning asked whether he could proceed with planning and development of the Compliance Module within the Research Office with the blessing of the Chemical Safety Committee. Member agreed this was okay. Member Manning asked if there were any members opposed to the idea and there were no objections.

6. **US Chemical Safety Board Case Study of Texas Tech University Laboratory Explosion**

Member Glode described the recent Chemical Safety Board case study of the Texas Tech University laboratory explosion. The case study as well as videos were distributed to members for review. One of the main conclusions of the study was that policies and procedures related to protection of laboratory staff from physical hazards are often included in university safety plans or chemical hygiene plans. The OSHA Laboratory Standard was written with the purpose of protecting laboratory workers from chemical exposures and does not address physical hazards like explosion or fire hazards. UNH has experienced events in the past that have caused damage and injury as a result of physical hazards, and so it is incumbent upon us to follow recommendations in the report. To this end, OEHS has contacted the Chemistry Department to begin the process of evaluating the procedures and policies in place related to physical hazards. It is hoped that work done with the Chemistry Department will set a standard for review in other departments on campus.

Member Manning added that the CSB is recommending assessment down to the level of specific lab processes and procedures thus requiring very detailed review. The current UNH Laboratory Safety Plan does not include topics of particular concern to the CSB such as explosion hazards.

Several members agreed that the CSB video was an effective tool and should have a wider audience on campus. Member Rohwer suggested it could be included in the CHEM 800 or the 699 senior thesis course. Member Greenwood added that the video is a good tool to remind people about laboratory hazards and supported the idea of watching similar videos annually.
Member McDowell asked if OEHS could be proactive in minimizing hazards in labs by suggesting chemical substitutions or alternate procedures. Also, he asked if more can be done to notify faculty members about laboratory incidents. Member Whistler responded that OEHS does a good job of working collaboratively with PIs to achieve compliance. She thought that by getting more involved in recommending processes or reducing chemical usage, they may raise hackles and get less cooperation.

Member McCrone added that he does make an effort to maintain a cooperative relationship with faculty member and he does review generation with PIs in some cases depending on the circumstances. Also, there are several examples of OEHS providing support in order to minimize volume and toxicity of waste such as: mercury exchange and reduction projects, support of the NHVDL laboratory solvent still, support of the Chemistry Department micro-scale equipment.


Member Manning stated that concerns raised by Chemistry were addressed and resent to them. Member Rohwer reported that Chemistry has no more outstanding concerns and supports acceptance of the plan. Member Whistler made a motion to accept the plan, Cindi seconded the motion. Members voted unanimously to accept the plan.

8. Laboratory Safety Audits Updates

Member Glode stated most recent safety audits have been performed in Gregg Hall. The next building to be inspected will be Kingsbury Hall. He mentioned that he identified many issues with hazardous waste management in Gregg Hall and put special emphasis on identification and correction of these issues as a result of the upcoming inspection. Member McCrone added that as a result of the inspection findings, he has increased his face time with lab occupants in Gregg to help resolve outstanding issues and he agrees that waste container management practices need to be improved. Member Rohwer added that reminding faculty of the importance of proper waste management is important.

Member Glode updated the committee on lab safety projects he has been working on since the last committee meeting. These projects included the following:

- Reviewing information regarding the UNH-M renovation project.
- Participating in Parsons Hall Resolution Group to help resolve outstanding issues with pass-through fume hoods and fume hood face velocity monitors.
- Continued engagement with Facilities Operations and Energy Office on fume hood repairs.
- Mitigation Fund projects:
  - Designed cylinder rack with Kevan Carpenter in Morse Hall and contracted fabrication with local metal fabricator.
  - Purchased flammable storage refrigerators for laboratories in Parsons and Gregg Hall.
  - Purchased flammable cabinet for NHVDL.
  - Purchased Teflon caps and tubing and a carbon filter to vent the HPLC waste in the Celentano waste in Kendall.
• Continued with purchase and distribution of self-contained eyewashes on campus including Rudman, NH Hall, and Chase Ocean Engineering.

9. New Business

Member Whistler asked about the purpose of the hazardous waste survey distributed some time ago. Member McCrone responded that the survey was related to the review coordinated by FD&C. The initial hazardous waste survey was the first round of review where proposals were provided by Veolia and Clean Harbors Environmental Services. Due to the total possible project cost, FD&C is required to get another proposal, so recently they reviewed campus waste management with Triumvirate Environmental. The goal of the review is to evaluate if hazardous waste management can be done with more on-site service and achieve savings resulting from less capital investment in campus infrastructure.

Member Manning added that OEHS is organizing dates for fire extinguisher training. The training would be performed by Tri-State Fire Protection Services and would include live use fire extinguishers. He mentioned OEHS will reach out to committee members and departments who may be interested in participating in the training. Members Rohwer and Whistler mentioned that this training could be integrated into the TA orientation courses.

10. Next Meeting

The next meeting will be May 17 at 12:30–2:00 PM in Rudman G79.

11. Adjourn

The committee meeting was adjourned at 2:15 PM.
Chemical Inventory Updates from Ken Brown:

• To date in 2012, we have completed scanning Kendall and Parsons. New signs have not been printed for either building yet.

• OEHS has hired two new students to assist with scanning, however they each can only work 12 hours a week, and they are being shared by three staff members. It is expected that they will work full time during the summer on the chemical inventory. We are hoping to get additional help. Ideally, we can complete the entire campus before school starts in the fall.

• Depending on the amount of student help available, it may be possible to report on scanning results for individual labs or PIs, but I cannot guarantee it.

Chemical verifications have historically been performed using hand-held PDAs. However, the technology is old, and the operating systems cannot be updated. This created a chronic situation when we scanned because we couldn’t tell if the container information was ever entered into UNHCEMS in the first place (some people mistakenly believe that the barcodes we apply act in the same way as UPC codes, but they don’t).

OEHS has hopefully solved this problem. We have purchased new scanners and had-held devices, and also contracted with Research Computing to design a new UNHCEMS application that provides visual and audible alerts if a barcode is not in the system. Going forward, this should provide more accurate chemical inventories.

That being said, in less than two completed buildings we found 118 containers that had been received in labs that weren’t barcoded. This meant that we had to take the time to barcode them, write down the chemical information, and enter it into UNHCEMS upon returning to the office. There were also containers that had been barcoded, but the information had not been entered, which prompted our solution above.

We have 15 more buildings containing labs to cover, in addition to farms and facilities service buildings.
HAZARDOUS WASTE ACCUMULATION REQUIREMENTS

- Do you know your responsibilities for proper handling of hazardous waste?
- Please review the following requirements to ensure that you comply with environmental regulations.

TRAINING:
- Hazardous waste handlers must receive hazardous waste training. Penalty for non-compliance is $1,000 per area.

CONTAINER MANAGEMENT:
- Must be in good condition and non-leaking. Penalty for non-compliance is $1,000 per container.
- Container is compatible with the waste stored in it (i.e. glass for acids.) Penalty assessed is $1,000 per container.
- Separate incompatible materials by using secondary containment trays. Penalty assessed is $1,000 per area.

CONTAINER LABELING:
- All containers must be labeled with a University of New Hampshire hazardous waste label.
- Hazardous waste labels must be clearly visible and legible. Penalty assessed is $100 per container.

Each hazardous waste label must contain the following information:
- The words “Hazardous Waste.”
- All hazardous constituents (no abbreviations or chemical formulas.)
- The generator, building, and laboratory information on the label.
- Penalty assessed for improper labeling is $1,000 per area.

CONTAINER CLOSURE:
- Hazardous waste containers must be closed at all times, except when immediately adding or removing waste. Penalty assessed is $1,000 per area.

STORAGE:
- All hazardous waste containers must be stored within a designated secondary containment tray. Penalty assessed for an area with an active sink or floor drain is $2,000 per area.
- Containers must be stored on an impervious surface. Penalty assessed for storage on other surfaces is $1,000 per area.
- Hazard communication door signage must be posted.

HAZARDOUS WASTE DISPOSAL PROCEDURES:
- Please notify Marty McCrone (Marty.McCrone@unh.edu) at 862-3526 or Jeff Anderson (Jeff.Anderson@unh.edu) at 862-0683 for container pick up. You may also submit a “Hazardous Waste Pick Up Form” on CEMS as well.
## INCOMPATIBLE MATERIALS

### Appendix V to Part 265—Examples of Potentially Incompatible Waste

Many hazardous wastes, when mixed with other waste or materials at a hazardous waste facility, can produce effects which are harmful to human health and the environment, such as (1) heat or pressure, (2) fire or explosion, (3) violent reaction, (4) toxic dusts, mists, fumes, or gases, or (5) flammable fumes or gases.

Below are examples of potentially incompatible wastes, waste components, and materials, along with the harmful consequences which result from mixing materials in one group with materials in another group. The list is intended as a guide to owners or operators of treatment, storage, and disposal facilities, and to enforcement and permit granting officials, to indicate the need for special precautions when managing these potentially incompatible waste materials or components. This list is not intended to be exhaustive. An owner or operator must, as the regulations require, adequately analyze his wastes so that he can avoid creating uncontrolled substances or reactions of the type listed below, whether they are listed below or not.

It is possible for potentially incompatible wastes to be mixed in a way that precludes a reaction (e.g., adding acid to water rather than water to acid) or that neutralizes them (e.g., a strong acid mixed with a strong base), or that controls substances produced (e.g., by generating flammable gases in a closed tank equipped so that ignition cannot occur, and burning the gases in an incinerator).

In the lists below, the mixing of a Group A material with a Group B material may have the potential consequence as noted.

<table>
<thead>
<tr>
<th>Group 1-A</th>
<th>Group 1-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetylene sludge</td>
<td>Acid sludge</td>
</tr>
<tr>
<td>Alkaline caustic liquids</td>
<td>Acid and water</td>
</tr>
<tr>
<td>Alkaline cleaner</td>
<td>Battery acid</td>
</tr>
<tr>
<td>Alkaline corrosive liquids</td>
<td>Chemical cleaners</td>
</tr>
<tr>
<td>Alkaline corrosive battery fluid</td>
<td>Electrolyte, acid</td>
</tr>
<tr>
<td>Caustic wastewater</td>
<td>Etching acid liquid or solvent</td>
</tr>
<tr>
<td>Lime sludge and other corrosive alkalies</td>
<td></td>
</tr>
<tr>
<td>Lime wastewater</td>
<td>Pickling liquor and other corrosive acids</td>
</tr>
<tr>
<td>Lime and water</td>
<td>Spent acid</td>
</tr>
<tr>
<td>Spent caustic</td>
<td>Spent mixed acid</td>
</tr>
<tr>
<td></td>
<td>Spent sulfuric acid</td>
</tr>
</tbody>
</table>

**Potential consequences:** Heat generation; violent reaction.

<table>
<thead>
<tr>
<th>Group 2-A</th>
<th>Group 2-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>Any waste in Group 1-A or 1-B</td>
</tr>
<tr>
<td>Beryllium</td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td></td>
</tr>
<tr>
<td>Lithium</td>
<td></td>
</tr>
<tr>
<td>Magnesium</td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
<td></td>
</tr>
<tr>
<td>Sodium</td>
<td></td>
</tr>
<tr>
<td>Zinc powder</td>
<td></td>
</tr>
<tr>
<td>Other reactive metals and metal hydrides</td>
<td></td>
</tr>
</tbody>
</table>

**Potential consequences:** Fire or explosion; generation of flammable hydrogen gas.
# INCOMPATIBLE MATERIALS

<table>
<thead>
<tr>
<th>Group 3-A</th>
<th>Group 3-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohols</td>
<td>Any concentrated waste in Groups 1-A or 1-B</td>
</tr>
<tr>
<td>Water</td>
<td>Calcium</td>
</tr>
<tr>
<td></td>
<td>Lithium</td>
</tr>
<tr>
<td></td>
<td>Metal hydrides</td>
</tr>
<tr>
<td></td>
<td>Potassium</td>
</tr>
<tr>
<td></td>
<td>$\text{SO}_2\text{Cl}_2$, $\text{SOCl}_2$, $\text{PCl}_3$, $\text{CH}_3\text{SiCl}_3$</td>
</tr>
<tr>
<td></td>
<td>Other water-reactive waste</td>
</tr>
</tbody>
</table>

Potential consequences: Fire, explosion, or heat generation; generation of flammable or toxic gases.

<table>
<thead>
<tr>
<th>Group 4-A</th>
<th>Group 4-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohols</td>
<td>Concentrated Group 1-A or 1-B wastes</td>
</tr>
<tr>
<td>Aldehydes</td>
<td>Group 2-A wastes</td>
</tr>
<tr>
<td>Halogenated hydrocarbons</td>
<td></td>
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<tr>
<td>Nitrated hydrocarbons</td>
<td></td>
</tr>
<tr>
<td>Unsaturated hydrocarbons</td>
<td></td>
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<tr>
<td>Other reactive organic compounds and solvents</td>
<td></td>
</tr>
</tbody>
</table>

Potential consequences: Fire, explosion, or violent reaction.

<table>
<thead>
<tr>
<th>Group 5-A</th>
<th>Group 5-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spent cyanide and sulfide solutions</td>
<td>Group 1-B wastes</td>
</tr>
</tbody>
</table>

Potential consequences: Generation of toxic hydrogen cyanide or hydrogen sulfide gas.

<table>
<thead>
<tr>
<th>Group 6-A</th>
<th>Group 6-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorates</td>
<td>Acetic acid and other organic acids</td>
</tr>
<tr>
<td>Chlorine</td>
<td>Concentrated mineral acids</td>
</tr>
<tr>
<td>Chlorites</td>
<td>Group 2-A wastes</td>
</tr>
<tr>
<td>Chromic acid</td>
<td>Group 4-A wastes</td>
</tr>
<tr>
<td>Hyphochlorites</td>
<td>Other flammable and combustible wastes</td>
</tr>
<tr>
<td>Nitrates</td>
<td></td>
</tr>
<tr>
<td>Nitric acid, fuming</td>
<td></td>
</tr>
<tr>
<td>Perchlorates</td>
<td></td>
</tr>
<tr>
<td>Permanganates</td>
<td></td>
</tr>
<tr>
<td>Peroxides</td>
<td></td>
</tr>
<tr>
<td>Other strong oxidizers</td>
<td></td>
</tr>
</tbody>
</table>

Potential consequences: Fire, explosion, or violent reaction.
The fine for non-compliance with any of these is $1000-$2000.

Label waste containers with full chemical names of all constituents.

Hazardous waste handlers must take haz. waste training in Blackboard.

Store containers in secondary containment with compatible materials.

Keep hazardous waste containers closed at all times.

It is very likely the State of NH Department of Environmental Services will perform Inspectors are coming in 2012!