

REM NEWS

March 1999

Violation Uncovered During EPA and IDEM Chemical Waste Management Compliance Inspections

By: Paul Muraca

Purdue University generates more than 1000 kg (2,200 lbs) of hazardous waste per month. To manage this volume, Purdue operates a state- and federally-permitted Treatment, Storage and Disposal facility (TSD) known as the Laboratory Materials Storage Building (LMSB). Due to this waste generation volume and responsibility to manage a TSD facility, the University is subjected to annual site inspections from the Environmental Protection Agency (U.S. EPA) and the Indiana Department of Environmental Management (IDEM). The purpose of these inspections is to evaluate compliance with certain requirements of the Resource Conservation and Recovery Act (RCRA); specifically, those regulations and permit conditions related to the generation, treatment and storage of hazardous wastes.

This past September 9th and 10th, a representative from the US EPA inspected the University's waste management operations and procedures at the LMSB and at waste generation sites ("satellite waste accumu-

lation areas" – labs and shops) across campus. Although no violations were identified in campus laboratories, a violation was identified at the Physical Facilities Paint Shop. Specifically, the inspector found wastes stored in excess of the quantity and time restrictions for satellite waste accumulation areas. *See the article in this Newsletter titled "Hazardous Waste Accumulation in the Laboratory," for a more detailed discussion of waste storage requirements for satellite accumulation areas.*

Even though the Radiological and Environmental Management (REM) staff immediately abated and corrected the violation, this incident resulted in an enforcement action against the University. On November 10, 1998, the University received a Notice of Violation (NOV) from the US EPA identifying the violations and enforcement steps to be taken by the EPA against the University for failing to comply with the RCRA regulations. After providing the EPA with information describing the actions taken toward achieving and maintaining compliance, on December 17, 1998, the EPA determined that the Univer-

sity corrected the violations and returned to compliance.

Given this recent enforcement action, the REM department wishes to remind you of your responsibility for RCRA compliance for managing hazardous chemical wastes. Specifically, we request that you inspect those areas where waste is generated and/or stored for compliance with the following waste management criteria:

- *Ensure all waste containers are tightly capped and properly labeled.*
- *Submit frequent waste pickup requests to avoid storing large quantities of wastes.*
- *Ensure all waste storage containers are compatible with the waste constituents.*
- *Ensure all waste storage containers are not leaking and that the exteriors are free of contamination or spilled residues.*
- *Call 765-494-0121 for further waste management information or site-specific assistance.*

Abandoned Lab Chemicals

By: Ann Piechota

Faculty, post-docs and students seem to leave the University on a daily basis. All too often, our departing coworkers leave behind partially completed experiments, stock solutions, petri dishes and even body parts. Who gets stuck with cleanup? It falls on the shoulders of personnel remaining in the labs, building maintenance, building deputies, facility managers, facility services personnel and REM. And, because many of these materials are not clearly labeled, disposal can be very time consuming, costly and potentially risky.

What can be done to make things easier? If you work with chemicals, be sure all materials are labeled at all times. If you are planning to leave, sort through the materials you use. Those which will not be used by others in the lab should be sent to REM using the pickup request form in the "Hazardous Materials Guidelines." If you need assistance, call REM. Likewise, if you know of someone who is leaving, let us know. It is easier and cheaper to address hazardous materials issues before rather than after the generator leaves. Avoid the headaches. If you have any questions, call 765-494-0121.



What Is Lockout/Tagout?

By: Don Campbell

Lockout/Tagout is an OSHA-required (29 CFR 1910.147) safety program. It ensures that before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, start-up, or release of stored energy could occur and cause injury, the machine or equipment is isolated from the energy source and rendered inoperative.

Are Purdue employees affected by this lockout/tagout standard?

Indiana OSHA has an identical lockout/tagout (LO/TO) standard and Purdue employees are covered.

Does Purdue have a lockout/tagout program?

Yes. The program requires that energy control procedures be developed, documented (written), and used to control potentially hazardous energy sources, whenever workers perform activities covered by the LO/TO standard.

Is a written energy control procedure required for each of my machines or pieces of equipment?

If the information employees must know in order to control hazardous energy during service or maintenance is the same for various machines or equipment or if other means of logical grouping exists, then a single energy control procedure may be sufficient.

If there are other conditions, such as multiple energy sources, different connecting means, or a particular sequence that must be followed to shut down the machine or equipment, then separate energy control procedures must be written and used to protect employees.

Where can I see Purdue's program?

To see Purdue's written lockout/tagout program, visit REM's web site at <http://www.purdue.edu/REM>. Click on Guide to REM Services; click on General Safety and Ergonomics; then, click on Lockout/Tagout. To go directly to the lockout/tagout program, enter <http://www.purdue.edu/REM/safety/loktag.htm>

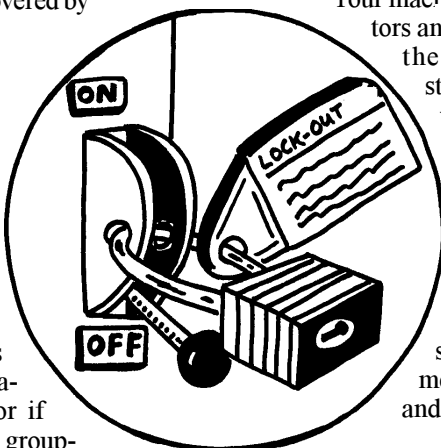
www.purdue.edu/REM/safety/loktag.htm in your browser's open page window.

Can I see the OSHA Lockout/Tagout Standard?

Visit OSHA's LO/TO address at: http://www.osha-slc.gov/OshStd_data/1910_0147.html.

Do my employees need lockout/tagout training?

Yes, if they service or maintain machinery or equipment in which (1) they must either remove or bypass machine guards or other safety devices, resulting in exposure to hazards at the point of operation or; (2) the employee is required to place any part of his or her body in contact with the point of the operational machine or piece of equipment or; (3) the employee is required to place any part of his or her body into a danger zone associated with a machine or operating cycle.



Your machine or equipment operators and all other employees in the area need to be instructed to (1) recognize when the energy control procedure is being implemented (they see the locks and tags) and; (2) understand the purpose of the procedure and the importance of not attempting to start-up or use the equipment that has been locked and tagged out.

Where can my group and I receive training in lockout/tagout procedures?

For video/lecture/questions, including hands-on, contact REM at 494-3134 or dacampbell@physfac.purdue.edu. To receive LO/TO training by CD-ROM, contact Lisa Bittles, Building and Grounds Training Department at 494-1359 for scheduling.

Is there a charge for training?

No, your only cost is your employee's time spent in training.

How long is the training?

Video/hands-on training is 90 minutes. The CD-ROM training is 2.5 hours, which includes pre and post-training tests.

Hydrofluoric Acid Caused Fatal Accident In Australia

While sitting at a fume cupboard processing mineral samples, a laboratory technician knocked approximately 100 mls of hydrofluoric acid onto his thighs. Immediate 10% body burns ensued. Despite rapid flushing with water and emergency hospitalization, he died 15 days later.

Contributing Factors

- Corrosive and systemic poisoning properties of hydrofluoric acid following dermal exposures i.e., 2% body burns from 70% hydrofluoric acid may cause death.
- Failure to protect skin from exposure.
- Failure to restrain cups of hydrofluoric acid in secure holders.
- Failure to apply neutralizing cream (calcium gluconate gel).
- Poor work station design.

Recommendations on How to Work Safely with Hydrofluoric Acid:

- Ensure that work is carried out in accordance with the information provided on the Material Safety Data Sheet provided by the manufacturer/supplier.
- Plan work with the knowledge that exposure may cause permanent incapacity or death.
- Where practicable, substitute less dangerous substances.
- Alert workers to the lethal properties of hydrofluoric acid.
- Train workers in safe work procedures, personal protection and first aid/emergency procedures in accordance with the Material Safety Data Sheet.
- Ensure that safety showers, eye wash facilities and calcium gluconate gel are available wherever hydrofluoric acid is used.
- Laboratories should conform to established Laboratory Safety Guidelines.
- Persons should not work alone with hydrofluoric acid.

Source: WorkSafe Western Australia: Significant Incident Summary

Anthony Terry
Director, Occupational Health

As the Millennium Turns...Y2K and Lab Equipment

By: Carol Shelby

What Is It?

The Year 2000 (Y2K) problem is a result of computer program code "shorthand" – back in the '60s, when memory was limited, programmers only provided two digits for the year in date fields. When the year 2000 arrives, computerized equipment may fail, because the computer reads 1/1/00 as a date before 12/31/99. Experts now believe that the date related problems will even begin during 1999, since programmers also used 999 to denote "end of record" or "shut the program down."

How Will Y2K Affect Laboratories?

Aside from the obvious issues surrounding personal computers, there may be issues

with other scientific equipment. Computer chips that rely on a date for information may be imbedded in specialized lab equipment, such as control, monitoring, or other electronic devices.

What Is Being Done At Purdue?

Last year, Drs. Ford and Ringel issued a memo requesting Deans and Vice Presidents to establish a year 2000 (Y2K) users group. This group is responsible for investigating Y2K issues in each school and administrative unit. A listing of the members can be found on Purdue's Y2K web site at www.adpc.purdue.edu/Year2000/.

What Can You Do?

Survey the equipment in your lab.

Ask yourself and colleagues these questions:

1. Has a backup plan for potential failures been developed? (include scenarios where power or other utilities are lost for 24-48 hours)
2. Will personnel be available to monitor critical research over the turn of the millennium?

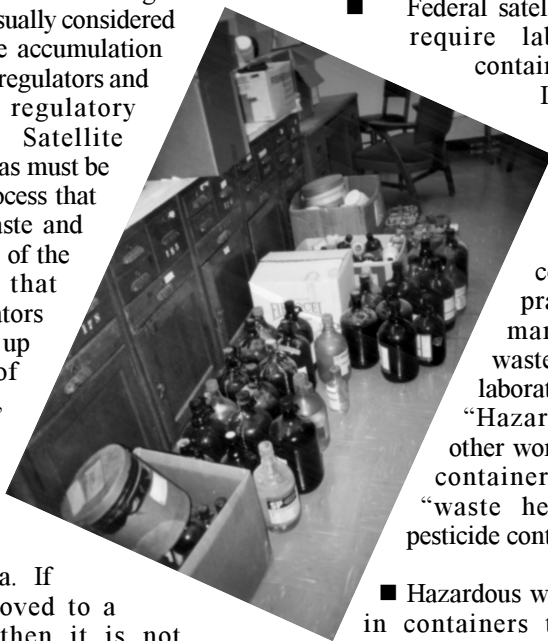
Who Can You Contact?

Contact your departmental or school representative. The Y2K web site is a great link to many other Y2K resources. Contact the vendors of your lab equipment to ensure that your equipment is Y2K compliant. Contact your departmental safety committee or safety chair for a review of the safety issues associated with Y2K. Planning is a key element of being prepared for whatever the new millennium may bring!

Hazardous Waste Accumulation in the Laboratory

By: US EPA

Storage requirements for hazardous waste are specified under Federal (RCRA) and state requirements. At a minimum, Purdue lab staff should be aware that hazardous waste accumulating in laboratories are usually considered to be in "satellite accumulation areas" by federal regulators and are subject to regulatory requirements. Satellite accumulation areas must be at or near the process that generates the waste and under the control of the operator of that process. Generators may accumulate up to 55 gallons of hazardous waste, or 1 quart of "acutely hazardous waste", at a satellite accumulation area. If the waste is moved to a nearby room, then it is not considered in satellite accumulation and is subject to more stringent requirements. Waste in satellite accumulation areas must be managed.



- All hazardous waste containers in the laboratory must be kept closed during storage except when it is necessary to add or remove waste. Evaporation of wastes in fume hoods is prohibited.
- Federal satellite area rules only require labels listing the container's contents, but Indiana requires that the contents, the hazard and the actual words, "Hazardous Waste," be on the container. Prudent practice would be to mark all hazardous waste containers in the laboratory with the words "Hazardous Waste" and other words that identify the container's contents (e.g., "waste hexane with trace pesticide contamination").
- Hazardous waste must be stored in containers that are in good condition and are compatible with the wastes they contain.

Safety Alert

By: John C. Angus
Case Western Reserve University
Cleveland

Please note that mixtures of sodium and carbon tetrachloride are extremely dangerous.

Explosion Hazard

A method for the synthesis of diamond by reaction of sodium with carbon tetrachloride by Ya-Dong Li and colleagues was described in *Science/Technology Concentrate* (C&EN, July 13, page 55). Readers of this article should be aware that mixtures of sodium and carbon tetrachloride are exceedingly dangerous. After standing for a short time, the reaction products are shock-sensitive and highly explosive. Details of this reaction and other references can be found in the third edition of the "Handbook of Reactive Chemical Hazards" by L. Bretherick. Any mixture of halogenated hydrocarbons and alkali metals should be treated with great caution.

Sharps Used at the University

By: Bob Golden



What Are Sharps?

Sharps are items that are capable of puncturing, cutting, or abrading the skin, i.e., broken plastic or broken glassware, glass or plastic pipettes, scalpels, razor blades, needles, hypodermic needles, etc...

How to Dispose of Sharps:

After use, sharps are either “clean” or “contaminated” (with biological material, chemical, or radioactive materials). To dispose of clean sharps and decontaminated chemical exposed sharps, place them in a rigid puncture proof container (cardboard box or plastic container) that is labeled “Sharps” and dispose via the regular trash (make arrangements with your Building Service personnel). Biological and Radioactive contaminated sharps must be decontaminated and disposed through special pickup by REM.

Clean and Contaminated Sharps

Uncontaminated Clean Sharps	Biological Contamination	Chemical Contamination	Radioactive Contamination
Step 1			
Deposit in rigid, puncture-proof container.	Deposit in Sharps container with Bio Symbol.	Decontaminate with suitable cleaning agent.	Deposit in rigid, puncture-proof container.
Step 2			
Label container “Sharps.”	Complete “Biomaterial Pickup and Treatment Certification” form. Indicate Waste Category 1 or 2.	Deposit in rigid, puncture-proof container.	Label container “Sharps” and affix “Radioactive” label. Complete Rad Waste pickup form.
Step 3			
Discard in solid waste trash container.	Dispose via REM Bio Wash Program.	Label container “Sharps” and discard in solid waste trash container.	Dispose of material via REM Radiological Waste Management Program.

If you are injured by a sharp:

- 1) Wash the area with soap and water
- 2) Contact your supervisor
- 3) Report to PUSH Urgent Care for medical care
- 4) Supervisor-contact REM, 41496.

The goal is to provide the safest workplace for all employees. If you have questions regarding biohazards, biological safety, or would like a copy of the complete Sharps procedure, contact rwgolden@physfac.purdue.edu