LSU Laboratory Safety Accreditation

Office of Environmental, Health & Safety

December 2010

How to Prepare Your Lab for the Accreditation Audit

The Four Phases of Accreditation

1) The Quick Assessment Form, a one-page look at lab conditions.
2) The Pre-Audit Phase, collaborative discussions of what needs to be fixed.
3) Accreditation Audit, covers all areas of laboratory performance.
4) Notification, Celebration and Publication

The Quick Assessment Form

LSU Laboratory Quick Assessment Form

Date_____ Department_____

Auditor/s_____RAA_____ Building/Room _____

PI_____

	Y	N	N/A		Y	N	N/A
Employee training completed				Fire extinguisher inspected and not blocked			
EHS door postings present				Spill kits for acids/bases/ solvents avail.			
Radiation, Laser and Biological signs posted as needed				HF, Perchloric Acid or Picric Acid not used			
Emergency numbers posted				<5 gal. flammables outside flam. cabinets			
Chem. Inventory present in lab /available on system and used				No glass containers on floor			
Proper PPE used and dress requirements observed				All chemical containers identified and properly labeled			

The Pre-assessment Period

A collaborative effort

1. A review of QAF results between EHS and Lab personnel
2. Reviewing the audit components on the EHS Website.
3. What do we need to do?
4. Getting everyone involved
5. Scheduling the audit !

Audit Sections

A. Training
B. Hazard Communication
C. Protective Equipment
D. Fume Hoods and Glove boxes
E. Housekeeping
F. Emergency Response
G. Chemical Storage and Usage
H. Physical Hazards
I. Hazardous Waste
J. Biohazards

Section A

Laboratory

Training

Required Training
An overview

1) New Employee orientation and guidelines
2) Hazard communications training
3) Required PPE and dress requirement reviewed
4) Three required safety courses completed
5) Any standard procedures reviewed
6) Chemical inventory training complete

Section B

Hazard Communications

OSHA Hazard Communication Standard

- You have the right to know what you are working with

- Lab and Work Place Hazards should be communicated

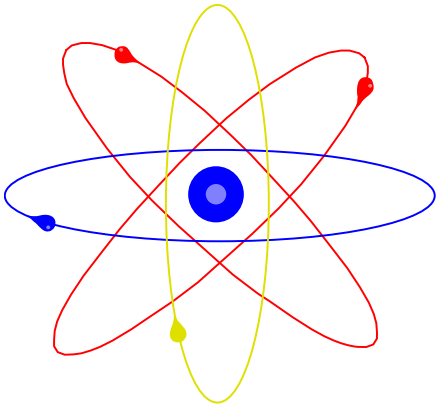
NOW WHERE DID I PUT THAT MSDS?

Do you communicate the hazards?

1. Are MSDS easily accessible?
2. Does the staff know what chemicals are in the lab.
3. Do they know how to use the inventory system.
4. Is necessary hazard warning signage present?

Labs that employ biohazards must post the biohazard rating for the lab. Contact the biosafety officer (Dr. Greg Hayes or Dr. Quinesha Morgan) at 8-4658.

BIOHAZARD



Radioisotope users must also place a radiation hazard sticker on the door sign. Call 8-2747 (Radiation Safety Office) to obtain the sticker.

LIFE SAFETY BOX

DO NOT TAMPER WITH THIS BOX
The Information It Contains May Save Your Life
Or the Lives Of Emergency Response Personnel.

ROOM ASSIGNED TO THIS BOX

Choppin 409

MAJOR CHEMICAL HAZARDS IN THIS ROOM ARE

THIS BOX CONTAINS:

1. Guide to Hazard Quantities
2. Hazardous Materials Inventory
3. Chemical Storage Map
4. Notification Sheet

EMERGENCY PHONE NUMBERS

- **Campus Police**
  - **578-3231**
  - **911 (Campus Land Line)**
- **EHS 578-5640**
- **Radiation Safety 578-2747**
- **Facility Services 578-2327**

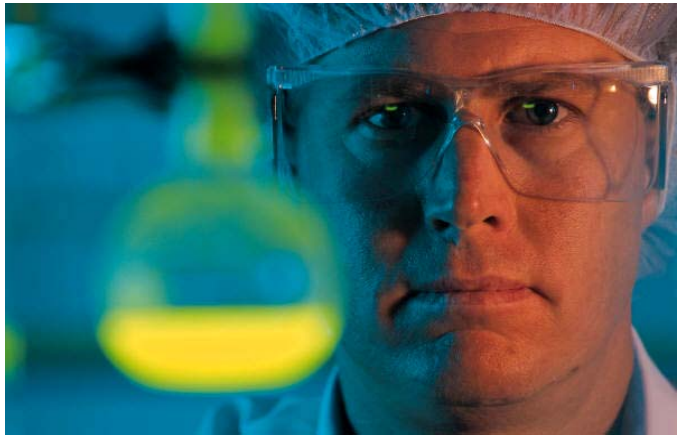
All refrigerators, ovens, and microwaves must have "LABORATORY USE ONLY" stickers attached. Household refrigerators should also have a "CAUTION DO NOT STORE FLAMMABLE SOLVENTS IN THIS BOX" sticker. The storage of flammable liquids in household refrigerators is prohibited.

Section C

Protective Equipment and Dress

Eye Protection

- Eye protection should be worn at all times in the lab
- Appropriate eye protection include safety glasses with side-splash protection, safety goggles or full face shield
- Prescription eyeglasses are not a substitute: safety glasses should be worn over eyeglasses



Protective Clothing

- Lab coats, gowns, or aprons are required at all times for lab work
- NO Protection if not Worn?

GLOVES

- Protection from direct skin contact
- Use for all procedures, cleaning of spills, and handling wastes
- Remember to remove your gloves **before answering phone**
- **Take your gloves and lab coat off when leaving the lab**

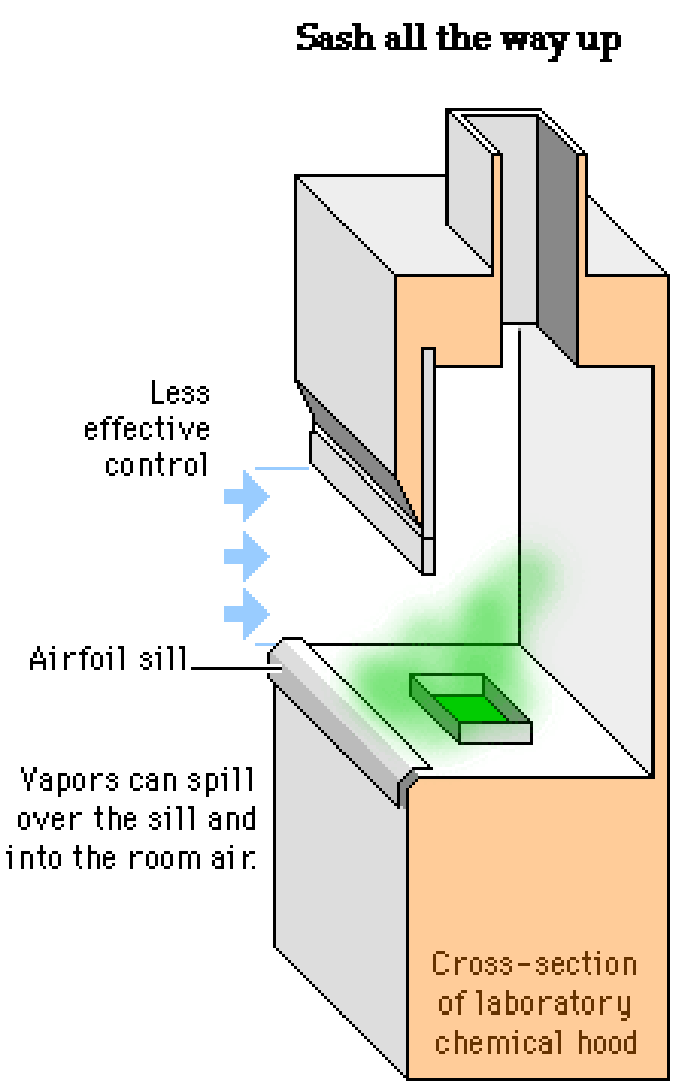
FOOT PROTECTION

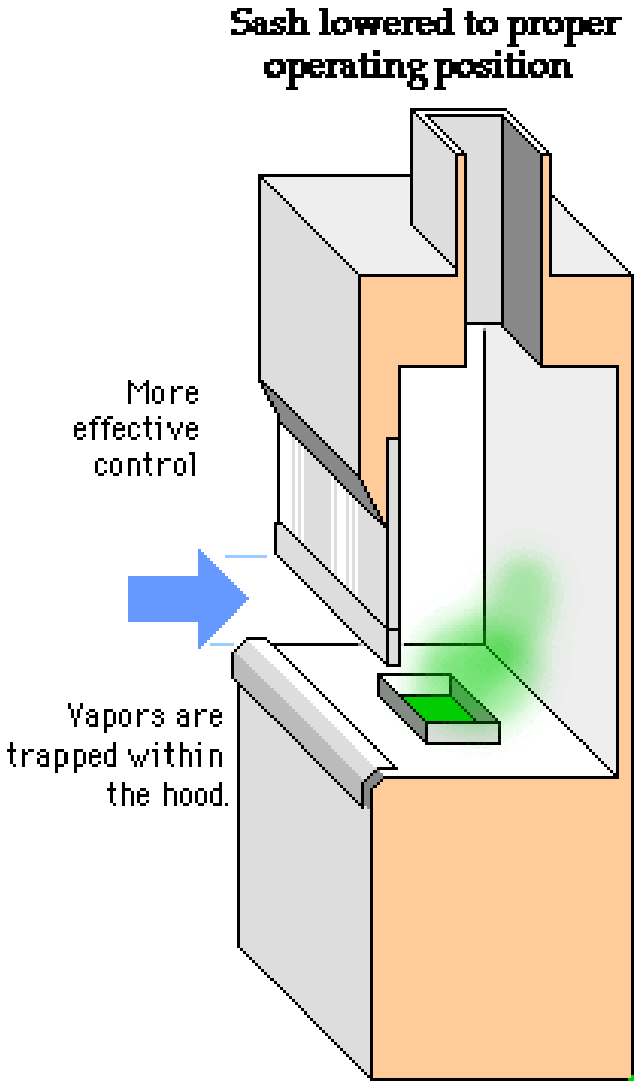
- Enclosed Shoes are Required
- No Flip Flops or Sandals

Section D

Fume Hoods and Glove Boxes

Improper Fume Hood Use





No Red Tags

Sufficient working space.

Not a storage spot

Sash in the correct position.

Do not block air flow with large equipment

Variacs and power strips not in hood.

Spark sources such as variacs and power strips must be stored outside of any fume hood where flammable solvents are employed.

Laboratory doors should be kept closed at all times to prevent the spread of flames should a fire occur. Doors with magnetic closure devices may be left open while the lab is occupied. Lab doors should remain closed when fume hoods are in operation in order to replicate the conditions under which the hood was certified.

Section E

House

Keeping

Housekeeping

- **A clean, well-maintained work area improves safety by preventing accidents.**
- **Enhances efficiency of work performed.**
- **Laboratory worker is responsible for**
  - **Cleanliness of personal workspace**
  - **Common areas of the laboratory**.

Sinks should be kept clean and free of glassware. Hand washing items such as soap and paper towels should be kept on hand.

Laboratory aisles should remain uncluttered from equipment storage etc.

Is there room to work SAFELY?

Section F

Emergency Response

The location of each safety shower and eye wash should be clearly posted. The area around showers and eye washes must be left unobstructed. Laboratory personnel should inspect eyewashes weekly.

All laboratories where flammables are stored or used should have a fire extinguisher.

DO NOT Block Access to Fire Extinguishers

Facility Services inspects extinguishers yearly to ensure that they are ready if needed.

Each lab should have a first aid kit that is properly stocked. It is up to laboratory workers to decide what items are or are not needed for the first aid kit.

A hydrofluoric acid treatment kit should be included if you use HF in your laboratory. Contact EHS for more information on HF kits.

All laboratories that employ hazardous chemicals must have a chemical spill kit that is capable of handling any spill in lab.

Laboratories that use large volumes of acids, caustics, or solvents may need to keep specialized spill control materials on hand.

An inexpensive spill kit can be made with kitty litter and other items such as gloves, safety glasses, a broom, and a dust pan. Kitty litter is an excellent all purpose absorbent and should be kept in labs where high volumes of solvents are stored.

Section G

Chemical Storage and Usage

Chemicals should be stored in compatible groups. Oxidizers should never be stored with flammables, acids should never be stored with bases, and toxics should be stored by themselves. Chemicals from different groups that are still compatible can be stored together.

Hazardous chemicals (particularly corrosives) should never be stored above the shoulder height of the shortest person in lab. When necessary, only non-hazardous chemicals should be stored on upper shelves.

Acids and bases must be stored separately in chemical resistant secondary containers to prevent the spread of corrosives should a spill occur.

All chemicals must be properly labeled as to the contents. Any labels that are illegible or have fallen off should be replaced.

Secondary chemicals containers should be labeled with the contents and the date on which the reagent was made. Labels that are loose or illegible should be replaced. All containers (including those that just hold water) must be labeled as to their contents.

Many chemicals such as anhydrous (diethyl) ether, tetrahydrofuran, and 1,4-dioxane readily form potentially explosive peroxides. These chemicals must be dated upon receipt and removed after the recommended period.

The most dangerous peroxide forming chemicals are potassium metal, isopropyl ether, sodium amide, and potassium amide. These chemicals must not be stored in lab for longer than three months.

Flammable liquids (NFPA flammability rating of 3 or 4) should be stored in a flammables cabinet. No more than two 60 gallon capacity cabinets are allowed per lab.

The allowable volume in lab is 20 gallons/100 sq feet for fire separated labs and 10 gallons/100 sq feet for non-fire separated labs. The maximum volume that may be stored in any lab is 120 gallons.

Up to 35 gallons of flammable liquids may be stored in the lab outside of the flammable cabinet.

Of the 35 gallons of flammables that are allowed to be stored outside of the flammable cabinet, 25 gallons must be stored in two gallon or smaller safety cans. The rest must be in five gallon or smaller containers.

Flammable liquids, other chemicals, and wastes must not be stored on the floor in glass containers due to the potential for breakage.

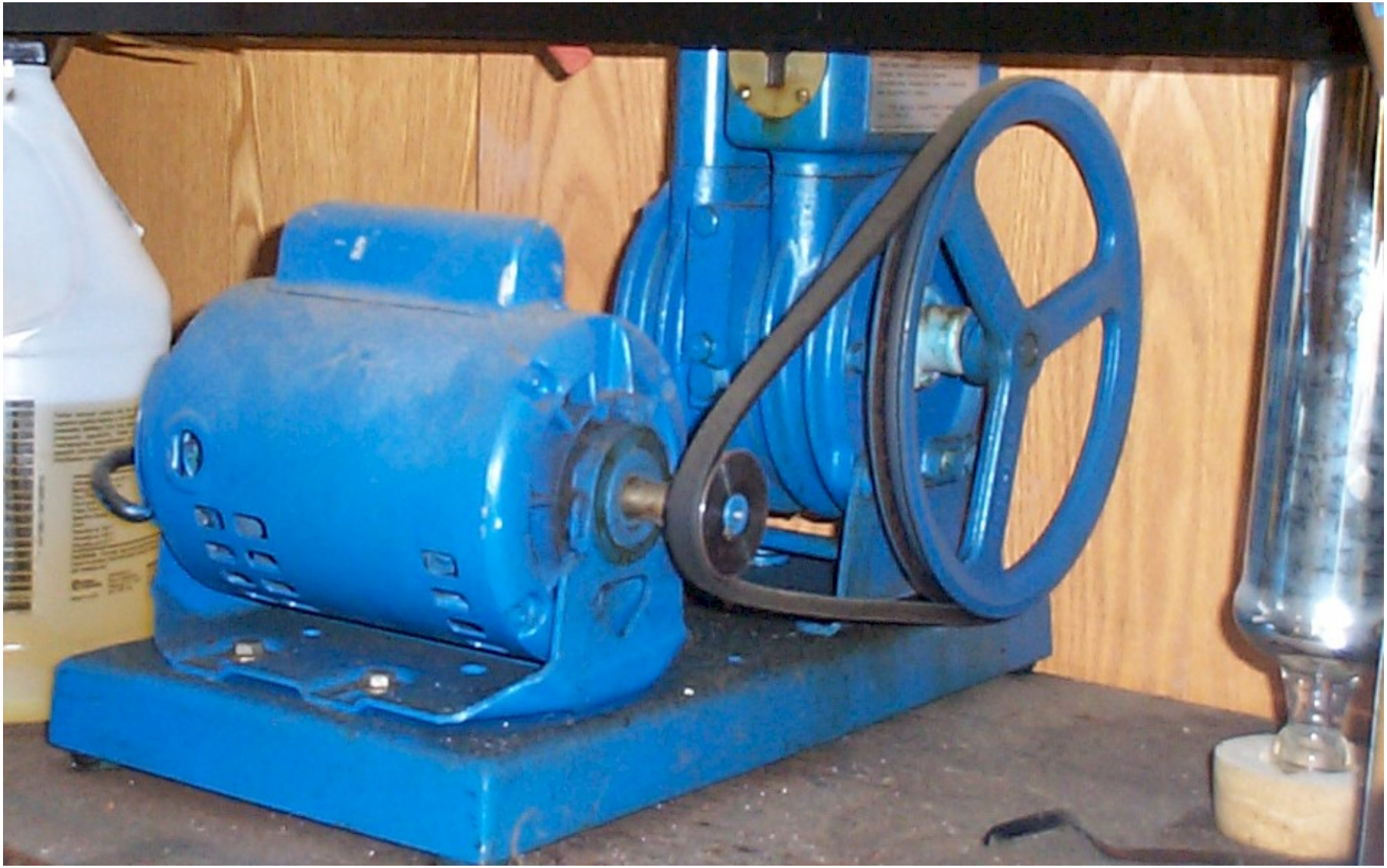
Flammable liquids that require refrigeration must be kept in either a flammable storage or an intrinsically safe refrigerator. They must <u>never</u> be stored in a household refrigerator due to the potential for explosions.

Gases such as carbon monoxide, chlorine, fluorine, phosgene, hydrogen fluoride, nitric oxide, sulfur dioxide, and hydrogen sulfide that have an NFPA health rating of 3 or 4 must be kept in a continuously ventilated mechanical enclosure such as a fume hood.

Food items should never be consumed in the lab due to the potential for contamination. Food consumption is permitted in locations that are segregated from the lab and designated as non-biological/non-chemical areas.

Section H

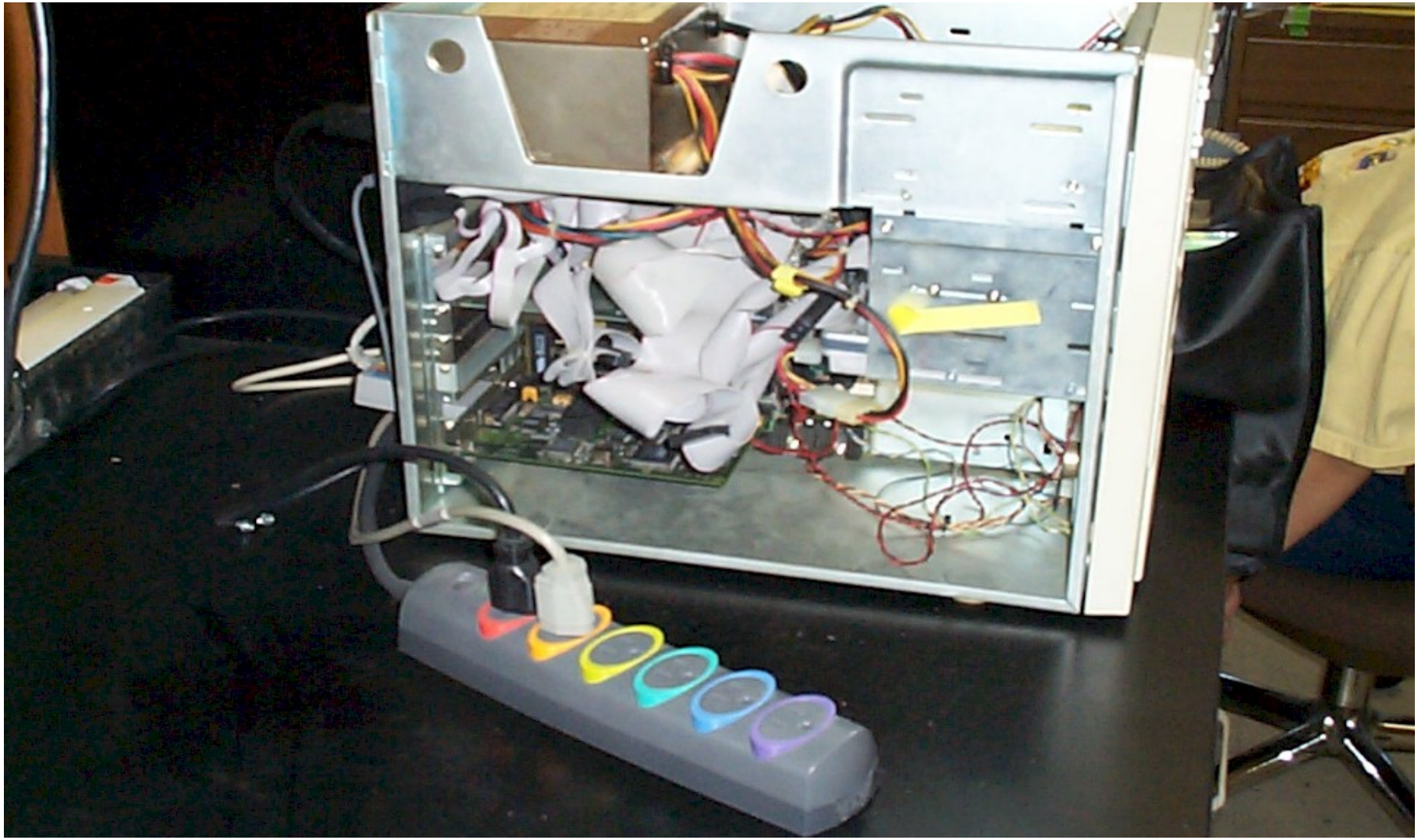
Physical Hazards



The belts and pulleys on all mechanical equipment must be guarded to prevent injuries.

All laboratory equipment must be properly grounded. Two-prong (ungrounded) adapters should never be used.

All laboratory power cords should be doubly insulated. Cords that are frayed or have exposed wiring should be replaced immediately.



In the lab, UL 1449 rated power strips (surge suppressed) are permitted for use with computers and computerized equipment only. Check for a UL sticker on the bottom of the strip.

Non-UL rated outlet boxes are not permitted in the lab. When additional outlets are required, they should be installed by Facility Services. Extension cords are allowed for *temporary* use only.

Gas cylinders must be securely anchored individually. They should also have a status label that indicates if the cylinder is full, empty, or in use. The practice of using a single chain to anchor several cylinders is dangerous and unacceptable.

Excess cylinders should be stored in an approved storage area outside of the lab. Flammable gases must be stored at least 20 feet away from oxygen and oxidizing gases. (Oxygen 20 feet from combustibles or seperated by 5 foot high wall.)

NO Cylinder Storage by Exit

Section I

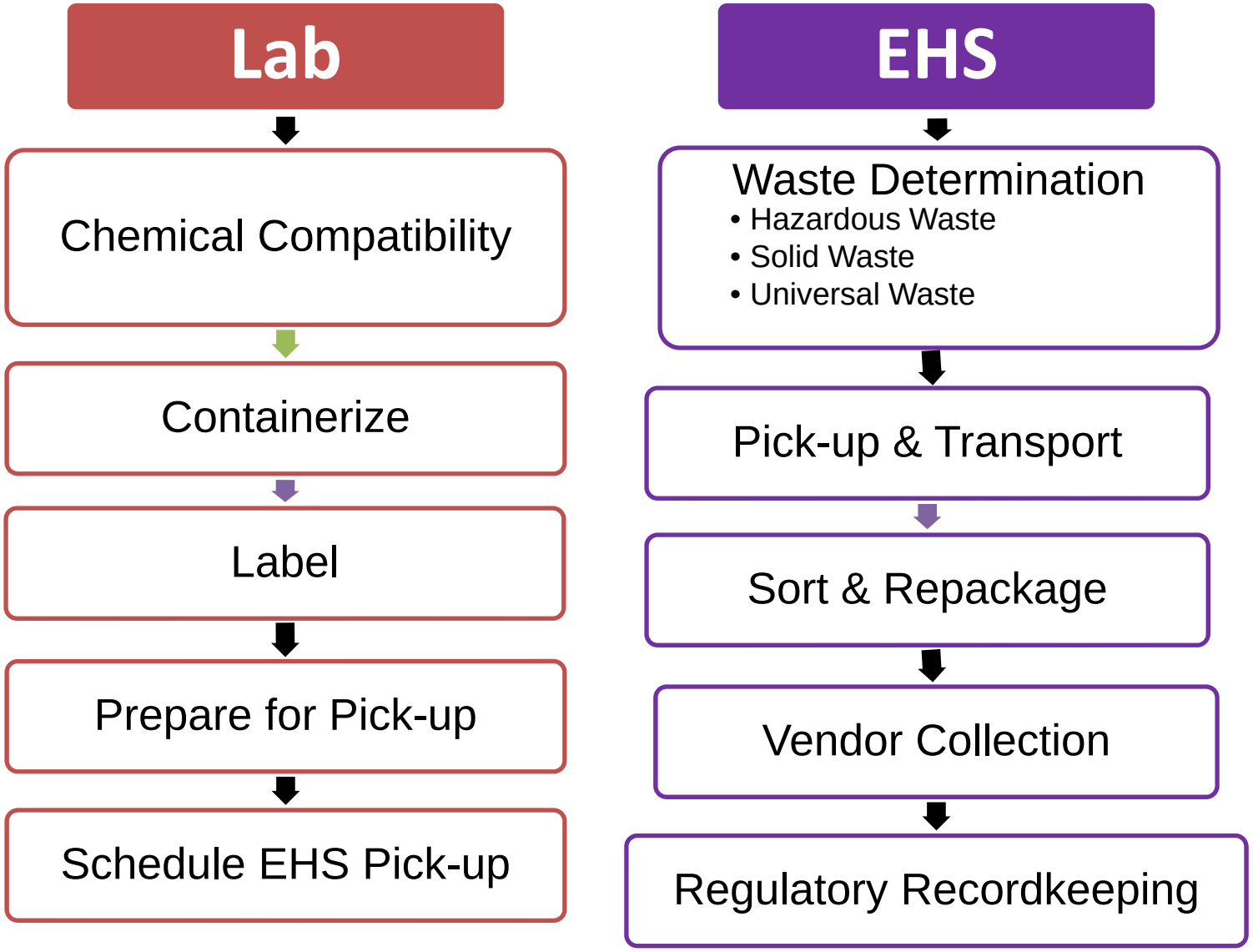
Hazardous Waste

Waste containers must be labeled as "HAZARDOUS WASTE". Waste containers must remain closed at all times except when waste is being added. Finally, hazardous waste must be placed in an appropriate container and stored in a manner that is compatible with other wastes.

Storage Containers Requirements

- **Waste Containers must be in Good Shape.**
- **Waste containers shall be closed at all times unless waste is being added to or removed.**
- **Containers must be compatible with Waste.**
- **No funnels without tight-seal lids in containers**
- **Do Not overfill containers.**
- **Use Secondary Containment**
- **Containers need to be labeled.**

Responsibility Summary



Example Violation

Open Container and Unknown Material.

1. Open Funnel
2. Contents not labeled
3. No secondary containment
4. Unknown

Example Violation

Waste Bottle with Funnel

in Sink

“Where else can organic material go?”

Example Violation

If a bottle is rusty, dusty, or crusty, an inspector can call it is Hazardous Waste and cite the lab.

Example Violation

Labeled, but the Inspector might cite the lab because the label is

1. **Not visible**
2. **Not readable**
3. **Two Different labels**

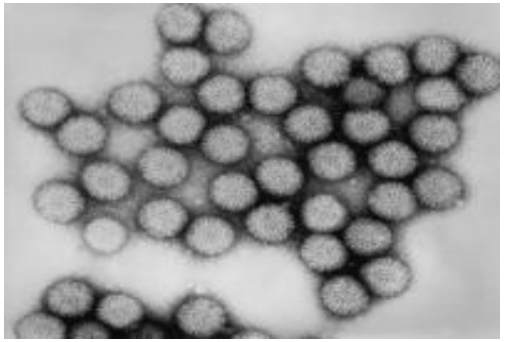
How to get rid of “unwanted” chemicals

- **If the container is in good shape:**
  - **Unused portions of reagent chemicals or unopened reagent containers can be redistributed or recycled by EHS.**
  - **The original unmarked label must be on the container. No waste labeling should be present.**
  - **EHS will make the waste determination as needed.**

Section J

Requirements for BSL-1 Laboratories

Basics of Biosafety



- Controlling exposures relies on:
  - Application of standard (universal) precautions
  - Use of engineering controls to minimize risk
  - Consistent application of work practice controls
  - Medical management of exposures

Work Practices

- No eating, drinking, smoking, storage of food or drinks, application of cosmetics or handling of contact lenses in lab
- Procedures involving potentially infectious materials done in ways that minimize splashing or the production of droplets
- PPE is removed and replaced when contaminated, and removed before exiting the lab

Cleaning and disinfection of work surfaces should be done after completion of each procedure and at the end of each work day.

Chemical agents effective against most pathogens: iodophors, phenolics, alcohol, diluted bleach (10% v/v).

Working with Biologicals

- Always handle a microbial culture as if it is an infectious material, or pathogen.
- Know your protocol / execute meticulously
  - Plan your need for protective equipment
- Know your materials and potential hazards
- Wear personnel protective equipment
- Whenever possible, use a biosafety cabinet
- Be alert for hazards, maintain concentration
- Wash your hands before leaving the laboratory.

Is the lab working with

- Biological Agents

  or

- Recombinant DNA

  or

- Biological Toxins ?

The Lab may need to be registered as a BSL.

Contact the Biological Safety Manager at 8-4658 for more information.

LSU Laboratory Safety Accreditation Audit Form

Audit Date				**Department**	
Auditor/s				**Building/Room**	
PI					

A. Training	**Y**	**N**	**n/a**	**Comments**
PI or designee provides lab-specific training to new employees and current staff as new hazardous substances or safety procedures are introduced:				
Hazardous Communications training complete				
Laboratory Safety presentation reviewed				
Required video training complete (3)				
PPE for laboratory reviewed				
Dress Requirements for lab reviewed				
Safe use of lab equipment, e.g autoclaves,centrifuges,glove boxes, hoods demonstrated				
Have personnel required to move, disconnect, and connect compressed gas cylinders been formally trained to do so? (Compressed Gas Association requirement.)				

Now that you have completed all of that work,

Your lab is ready!

Call Us When You Are Ready!

578-5640