

Procedure Subject: <i>Chemical Hygiene Plan</i>	Effective 1/1/09
Areas: Departments with Hazardous Chemicals	Reviewed/Revised: 3/22/2010

1.0 Purpose, Applicability, and Scope

- 1.1 Purpose (Include regulatory requirements) - To provide a framework for those individuals on campus who must draft a chemical hygiene plan, which provides written safety procedures for laboratory personnel that protects them from harmful chemical exposures.
- 1.2 Applicability – This shall apply to all students, staff and faculty on University of Tennessee Knoxville campus.
- 1.3 Scope – This procedure will meet the requirements of a chemical hygiene plan, as defined by the U.S. Occupational Safety and Health Act (OSHA) of 1970 and regulations of the U.S. Department of Labor including 29 CFR 1910.1450 "Occupational Exposure to Hazardous Chemicals in Laboratories" (the "Laboratory Standard").

2.0 Abbreviations, Acronyms, and Definitions

2.1 Abbreviations/Acronyms

CSO-Chemical Safety Officer
MSDS – Material Safety Data Sheet
NPDES – National Pollution Discharge Elimination Standard
PEL-Permissible Exposure Limits
PI-Principal Investigator
SOPs-Standard Operating Procedures

2.2 Definitions

Hazardous substance – Any substance that is capable of causing an acute or chronic health condition in humans or adversely impacting the environment. Substances that are considered physical hazards (flammable substances, explosives, shock sensitive, etc.) are included in the definition of a hazardous substance. The OSHA Hazard Communication Standard, 29 CFR 1910.1200 and the OSHA Chemical Hygiene Plan 29 CFR 1910.1450 are the two main standards that define a hazardous substance

Chemical User – Any department or group of university employees, staff, or students that handle hazardous substances on university property, or that work

offsite engaged in university-sponsored activities. Chemical Users can manage chemical inventories functionally either for a single lab, or for multiple related areas.

Permissible Exposure Limit (PEL)-An exposure limit that is published and enforced by OSHA as a legal standard. PEL may be either a time-weighted-average (TWA) exposure limit (8 hour), a 15-minute short term exposure limit (STEL), or a ceiling (C).

3.0 Roles and Responsibilities

a. Chemical Users shall:

- i. Read and understand the OSHA Chemical *Laboratory Standard* and UTK's Chemical Hygiene Plan.
- ii. Receive training at the time of their initial job assignment to a work area where hazardous chemicals are present, or prior to any assignments that involve any new exposure situations.
- iii. Be aware of the hazards of the chemicals they are working with and how to handle those chemicals in a safe manner.
- iv. Report any spills, accidents, or conditions that could lead to an accident involving hazardous chemicals to the PI or CSO.
- v. Understand and follow all SOPs and training received.
- vi. Understand all use of PPE and wear PPE when required.

b. Department heads who have chemical users under their control shall:

- i. Develop and enforce a chemical hygiene plan in cases where hazardous chemicals are used in the workplace. The chemical hygiene plan should cover specific measures that will be taken to ensure employee protection. The plan must be updated on an annual basis.
- ii. Appoint a Chemical Safety Officer (CSO).
- iii. Ensure that employees are trained to work safely with hazardous chemicals, respond appropriately when hazardous chemical spills occur, and report accidents associated with chemical exposure in the laboratory.
- iv. Seek ways to continually improve laboratory safety and chemical hygiene and work with EHS to ensure lab safety.
- v. Inform visitors that are required to perform work in the laboratory of potential chemical hazards.
- vi. Ensure that engineering controls (e.g., fume hoods, emergency showers and eyewashes) are operable and that personal protective equipment is available and used properly by laboratory staff working with hazardous chemicals.
- vii. Know and understand the requirements of the OSHA Laboratory Standard regulation (29CFR 1910.1450) and the UTK Chemical Hygiene Procedure.

Chemical Safety Officers shall:

- i. Be designated by the Department Head.
- ii. Know and understand the requirements of the OSHA Laboratory Standard regulation (29CFR 1910.1450) and the Chemical Hygiene Plan.
- iii. Participate in the investigation of serious accidents involving hazardous chemicals, acting as a liaison to EHS.
- iv. Assist PIs, as needed, with obtaining services or supplies and equipment for addressing chemical hygiene needs or correcting chemical hygiene issues.

c. EHS shall:

- i. Provide a format for developing a chemical hygiene plan.
- ii. Serve as a technical resource for questions and comments with writing a chemical hygiene plan.
- iii. Conduct annual safety inspections of the laboratories, and report their findings to the PI.
- iv. Test emergency equipment (i.e. fume hoods, eyewash stations) on an annual basis.
- v. Participate in investigation of serious accidents involving hazardous chemicals.
- vi. Act as a contact for Facility Services staff to address concerns regarding safety for work in the laboratory area.
- vii. Provide guidance regarding selection and use of personal protective equipment. When respirators are required, provide services to ensure personnel are provided the proper equipment, to ensure the equipment fits properly, and to ensure users receive the required training.
- viii. Provide safety training upon request.

4.0 Procedure

A chemical hygiene plan should contain the following elements:

- 1) Standard Operation Procedures (SOPs) are a set of instructions detailing uniform procedures that are carried out routinely, and safety precautions that must be taken when performing these procedures. SOPs are a requirement of the OSHA laboratory standard. Chemical hygiene plans cannot address all of the procedures for specific hazardous chemicals, but the procedures can be used when working with all hazardous chemicals in the lab. A copy of the SOPs must be in the laboratory and readily available to all employees. All employees must read these practices before performing any work in the laboratory. SOPs for procedures involving particularly hazardous chemicals (i.e. hydrofluoric acid, ethyl ether, allyl alcohol, lithium metal, etc.) should be developed for those particular chemicals.
- 2) General Rules of the Laboratory. All employees need to be aware of:

- Chemical Hazards, as determined by the MSDS or other sources
 - Protective equipment, if applicable, that is required when working with a particular chemical
 - Location and proper use of safety equipment.
 - Location and proper method to store chemicals when not in use.
 - Personal hygiene practices: These include such things as: wear safety glasses at all times in the lab; don't mouth pipette; wash hands before leaving the lab; do not eat or drink in lab; all employees should wear long sleeves and pants; long hair should be pinned back
 - Proper methods for transporting and disposing of chemicals on campus.
 - Procedures for emergencies, which includes: evacuation routes, spill cleanup procedures and proper waste disposal.
 - Stress that no one should work alone in a laboratory, and other safety measures.
 - Any other safety information that is specific to the laboratory should be included.
- 3) Control measures that will be implemented to reduce employee exposure to hazardous chemicals, and measures that will be taken to ensure the equipment is functioning properly and to ensure proper performance. This would include such items as personal protective equipment, fume hoods, respirators, safety showers, eyewash stations, etc.
- 4) Any employee training that is required.

Employees must be provided training at the time of their initial employment in a work area where hazardous chemicals are present, and prior to assignments involving new exposure situations.

Employees must be informed of:

- The Occupational Exposures to Hazardous Chemicals in Laboratories (29 CFR 1910.1450 Lab Standard)
- The location and accessibility of the Chemical Hygiene Plan, as well as the details of the chemical hygiene plan.
- Physical and health hazards of chemicals in the work area.
- Specific measures employees can protect themselves from chemical exposure (i.e. personal protective equipment, emergency procedures).
- The PELs for OSHA regulated substances (if they exist) or recommended exposure limits for the chemicals they will be using in the lab.
- Signs and symptoms associated with exposure to hazardous chemicals in the lab
- Location and availability of MSDS and other reference material.
- Hazardous waste management and waste minimization

- 5) Circumstances that require prior approval before implementation. This would be implemented when:
- There is a new procedure, process or test
 - There is a change or substitution of any chemicals used in a procedures
 - There is a substantial change in the amount of chemicals used.
 - There is a failure of safety equipment
- 6) Provisions for Medical exams and surveillance
- Medical exams and monitoring should be provided any time an employee exhibits any signs and symptoms of chemical exposure, they are exposed above the PEL, when an event takes place (i.e. spill, fire) which could result in an exposure, or when an employee wears a respirator.
 - Medical exams must be conducted by a licensed physician or under his/her supervision.
 - Employer must provide the following information to the physician
 - Identity of the hazardous chemicals to which the employee was exposed
 - Description of conditions under which exposure occurred
 - Description of signs and symptoms of exposure
 - MSDS or other information about the hazardous substance, if possible.
 - All incidents of exposure must be investigated by EHS and documented.
- 7) Provisions for additional protection for employees working with highly hazardous materials including:
- i. Allergens
 - ii. Reproductive Toxins
 - iii. Chemicals of moderate and high chronic toxicity, including carcinogens
 - iv. Chemicals of high acute toxicity
 - v. Highly chronic and acutely toxic chemicals used in animal experimentation.
- 8) Emergency Preparedness

All employees must know what specific action they will take in the event of the accidental release of any hazardous substances involved. They must know the location and how to operate all safety equipment including fire blankets, eye washes, safety showers, spill carts and spill control materials. They must also be familiar with the location of the nearest fire alarm and telephone, and know what telephone numbers and emergency contacts to call in the event of an emergency. This information must be detailed in the chemical hygiene plan.

- 9) Specific considerations must be given to the following provisions in the chemical hygiene plan when appropriate:

- Establishing a designated area
- Use of containment devices (i.e. fume hoods, etc..)
- Waste Disposal
- Decontamination

In addition, the chemical hygiene plan should include a statement saying that all necessary precautions taken and contained within the Chemical Hygiene Plan are compatible with current knowledge and regulations.

5.0 Recordkeeping

Starting in 2008 the University's central archived chemical inventories shall be kept for at least 30 years. These records may be kept in electronic or hard copy form.

Material safety data sheets must be kept indefinitely.

Medical records and records of exposure must be maintained for the duration of the employment plus 30 years.

Training records are kept for at least 3 years after an employee or student leaves UTK.

6.0 Attachments- None

7.0 Associated Standards

The following regulations and agencies require a chemical inventory directly or indirectly

- A. OSHA Hazard Communication Program (29 CFR 1910.1200)
- B. OSHA General Industry Standard ((29 CFR 1910).
- C. OSHA Chemical Hygiene Plan
- D. OSHA's Occupational Exposure to Hazardous Chemicals in Laboratories (29 CFR 1910.1450)