

# CHEMICAL HYGIENE PLAN FOR

Name of Laboratory\_\_\_\_\_

Building & Room

Number\_\_\_\_\_

Department or

Division\_\_\_\_\_

Principal Investigator or

Laboratory Manager\_\_\_\_\_

Person Responsible for

Chemical Hygiene

Plan\_\_\_\_\_

## CERTIFICATION OF ANNUAL REVIEW

This Chemical Hygiene Plan has been reviewed annually by:

---

Person Responsible for Chemical Hygiene Plan	Date	Date
--	------	------

Revised 11/30/06

### INDEX

Purpose of Chemical Hygiene Plan (1910.1450(e))  
Operating Procedures

Standard

Housekeeping

Criteria For Safety Measures

Chemical Inventory

Material Safety Data Sheets

Chemical Storage

Labeling

Engineering Controls

Contaminated Waste Removal/Disposal

Administrative Controls

Record Keeping

Personal Protective Equipment

Training

Chemicals Requiring Approval for Use

Medical Consultations and Examinations

Chemical Hygiene Plan Responsibilities

Provisions for Additional Employee Protection

Additional Safety Requirements Other Than Hazardous Chemicals

Glossary

Appendices

## **PURPOSE OF CHEMICAL HYGIENE PLAN (1910.1450(e))**

The development and implementation of a written Chemical Hygiene Plan (CHP) is the foundation of compliance required in OSHA's "Occupational Exposures to Hazardous Chemicals in Laboratories," published by Occupational Safety and Health Administration (OSHA) in the Federal Register, January 31, 1990, pages 3327-3335, which was incorporated in 29 CFR 1910. Additionally, these rules were adopted by the Tennessee Occupational Safety Administration (TOSHA). UTHSC shall be subject to any additional rules on this subject adopted by TOSHA at a subsequent time.

This rule and standard applies to all persons, including UTHSC

employees, students, and visitors authorized to be present at this particular location (laboratory). All persons subject to the CHP shall be informed of its location and availability, as well as of Material Safety Data Sheets (MSDS) and other pertinent reference materials relating to their health and safety while in this particular work area. Application of the CHP is in compliance with the UTHSC Administrative Manual, Laboratory Safety, Section 5.180, Safety and Health Policy, and Section 5.180, Safety and Health Procedures.

This plan shall be reviewed and evaluated for its effectiveness annually by the person responsible for this Chemical Hygiene Plan as well as the UTHSC Safety Affairs Department.

UTHSC is committed to providing a safe working environment and believes employees have a right to know about health hazards associated with their work so that employees can make knowledgeable decisions about any personal risks of employment. This Chemical Hygiene Plan includes policies, procedures, and responsibilities designed to develop in

employees an awareness of potentially hazardous chemicals in the workplace and to train employees in appropriate, safe working conditions.

It is important that employers assume responsibility for laboratory safety. All employees will have access to pertinent safety information through their supervisory staff. The people who work in any given laboratory are best able to detect potential hazards in either the facility or in work procedures. When safety concerns arise, employees are encouraged to contact their supervisor.

A laboratory safety training program is essential for the benefit and protection of all laboratory employees. All pertinent information will be provided to inform the employee on proper handling of hazardous and toxic chemicals.

(Date)

(Date)

## **UNIVERSAL PRECAUTIONS**

Because few laboratory chemicals are without hazards, general precautions for handling all laboratory chemicals should be adopted to include minimizing exposure and assuming that any mixture of hazardous chemicals is more toxic than the most toxic component.

The following procedures are used when working with chemicals:

1. Accidents and spills

a. Eye contact: promptly flush eyes with water for a prolonged period (15 minutes) and seek medical attention.

b. Ingestion: Each chemical affects the body differently. Consult MSDS &/or contact the Tennessee Poison Center at Vanderbilt University, telephone number 1-800-222-1222. ([www.mc.vanderbilt.edu/root/vumc.php?site=poisoncenter](http://www.mc.vanderbilt.edu/root/vumc.php?site=poisoncenter))

c. Skin contact: promptly flush the affected area with water and remove any contaminated clothing; use a safety shower when contact is extensive. If symptoms persist after flushing, seek medical attention.

d. Clean-up: promptly clean up spills, using appropriate personal protective equipment (PPE) and proper disposal. Clean-up should, in most cases, be performed by the staff technician.

**IN ANY CASE WHERE THERE IS QUESTION AS HOW TO SAFELY CLEAN-UP SPILLS, CONTACT THE DEPARTMENTAL SAFETY OFFICER IMMEDIATELY! IN ANY CASE WHERE THERE ARE SEVERE HEALTH HAZARDS DUE TO THE SPILL, CONTACT THE DEPARTMENTAL SAFETY OFFICER, WHO WILL IN TURN CONTACT THE UTHSC OFFICE OF SAFETY AFFAIRS AT 8-6114.**

e. Medical attention should be obtained following body contact with hazardous chemicals. (See Appendix A.)

2. Avoid unnecessary exposure to chemicals.

a. Do not smell or taste chemicals. Apparatus that can discharge toxic vapors (vacuum pumps, distillation columns, etc.) should be vented into local exhaust devices (chemical fume hoods).

b. Visually inspect gloves and test glove boxes before use.

c. Do not allow release of toxic substances in cold rooms and warm rooms, since these have contained recirculated atmospheres.

d. Use only those chemicals for which the quality of the available ventilation system is appropriate.

e. Never eat, drink, smoke, chew gum, or apply cosmetics or lip balm in areas where laboratory chemicals are present. Wash hands before conducting these activities outside the lab.

f. Storing, handling, or consuming food or beverages in chemical

laboratory storage areas, refrigerators, glassware, or utensils that are also used for laboratory operation is prohibited.

g. Handle and store laboratory glassware with care to avoid damage; do not use damaged glassware. Use extra care with Dewar flasks and other evacuated glass

apparatus; shield or wrap them to contain chemicals and fragments should implosion occur. Use equipment only for its designed purpose.

h. Wash areas of exposed skin thoroughly before leaving the laboratory.

i. Horseplay or disorderly conduct in the laboratory is prohibited.

j. Do not use mouth suction for pipetting or starting a siphon.

k. Confine long hair and loose clothing.

l. Wear shoes at all times in the laboratory, but do not wear sandals, open-toed, or perforated shoes. Where necessary, special boots or shoes may be required.

m. Keep the work area clean and uncluttered, with chemicals and equipment properly labeled and stored; clean up the work area on completion of an operation or at the end of each day.

n. Ensure that appropriate eye protection, where necessary, is worn by all persons, including visitors, in areas where chemicals are stored or handled.

o. Wear appropriate gloves when the potential for contact with toxic materials exists; inspect the gloves before each use, wash them before removal, and replace them periodically.

p. Use appropriate respiratory equipment when air contaminant

concentrations are not sufficiently restricted by engineering controls. Inspect the respirator before each use. The use of respirators requires special evaluation and training before they are used.

q. Use any other protective and emergency apparel and equipment as appropriate.

r. Avoid use of contact lenses in the laboratory; if

they are used, inform supervisor so special precautions can be taken.

s. Remove laboratory coats immediately upon contamination.

t. Seek information and advice about hazards, plan appropriate

protective procedures, and plan positioning of equipment before beginning any new operation.

u. Leave lights on, place an appropriate sign on the door, and provide for containment of toxic substances in the event of failure of a utility service (such as cooling water) in an unattended operation.

v. Use a chemical fume hood for operations that might result in release of toxic chemical vapors or dust. As a rule of thumb, use a hood or other local ventilation device when working with any appreciably volatile substance with a TLV of less than 50 ppm.

Confirm adequate hood performance before use: keep hood positioned at the proper level at all times except when adjustments within the hood are being made. Keep materials

stored in hoods to a minimum, and do not allow materials to block vents or air flow.

Leave the hood "on" when it is not in active use if toxic substances are stored in it or if it is uncertain whether adequate general laboratory ventilation will be maintained when it is "off".

w. Keep all oxidizing agents stored at least 10 feet away from solvents.

x. All chemicals should be stored in secure containers within

(preferably) enclosed cabinets. If enclosed cabinets are not available, open shelving should have minimum 6" guards built across the front of the shelving to prevent containers from falling off of the shelves.

y. Keep all flammable solvents stored separately from acids, each stored in authorized, appropriate storage cabinets. Keep all large quantity containers of chemicals within the appropriate storage cabinets, **ONLY REMOVING AMOUNT NEEDED FOR SPECIFIC EXPERIMENT, IMMEDIATELY RETURNING LARGE STORAGE CONTAINER BACK TO THE APPROPRIATE STORAGE CABINET.**

z. All chemicals should be regularly monitored to ensure effective shelf life status and continuing safety measures (e.g. picric acid containers kept appropriately moist). **IMMEDIATELY REQUEST DISPOSAL OF EXPIRED SUBSTANCES.**

aa. If questionable hazardous conditions are found, **IMMEDIATELY NOTIFY SUPERVISOR AND THE DEPARTMENTAL SAFETY OFFICER BEFORE ATTEMPTING TO REMEDY THE PROBLEM.**

bb. Properly label all chemicals being disposed of, providing detailed listing of all agents within the containers. **DO NOT MIX QUESTIONABLE AGENTS.**

cc. A "Departmental Order Request Form" (see Appendix B) should be submitted to the departmental purchasing agent on all chemical orders, whether orders are being made by the telephone or typed purchase requisitions. **A COPY OF ALL CHEMICAL**

PURCHASE REQ'S (OR DEPARTMENTAL ORDER REQUEST FORMS IN THE CASE OF TELEPHONE ORDERS) IS TO BE PROVIDED TO THE DEPARTMENTAL SAFETY OFFICER. (This enables the Departmental Safety Officer to

be aware of all chemicals entering the department so proper handling, monitoring, recordkeeping and training can be accomplished in compliance with regulatory requirements and UTHSC policies)

dd. Maintain a currently updated Material Safety Data Sheet (MSDS) manual within each laboratory area. Review the appropriate MSDS sheets in regard to any questions regarding how to safety handle, store or dispose of chemicals.

ee. Be aware of unsafe conditions and see that they are corrected when detected.

ff. No children or pets are allowed in laboratories.

## **HOUSEKEEPING**

Floors are cleaned regularly by housekeeping. All employees of the housekeeping department are formally trained in the risks associated with working in the laboratory. Information concerning specific risk in individual laboratories will be posted at the entrance to the laboratory, as well as relayed by a representative of the laboratory to the UTHSC Housekeeping Department, at 8-5661.

The housekeeping supervisor conducts a quarterly inspection of the lab areas to assess whether:

1. Stairwells and hallways are free of obstruction
  
2. Waste is deposited in appropriate receptacles and properly removed from the laboratory; i.e, bio-contaminated waste materials are placed in red bags, autoclaved waste materials are placed in orange bags
  
3. Chemical spills are cleaned according to established protocol.
  
4. Proper storage is accomplished to minimize clutter.
  
5. HOUSEKEEPING PERSONNEL ARE NOT TO CLEAN COUNTER TOPS. It is the responsibility of the assigned technical personnel to clean all countertops and upper surfaces within their laboratory area.
  
6. HOUSEKEEPING PERSONNEL ARE NOT TO CLEAN UP ANY TYPE OF SPILL UNTIL APPROVAL AND INSTRUCTIONS ARE OBTAINED FROM THE ASSIGNED TECHNICAL STAFF OF THE AREA. If technical personnel are not available, contact the Departmental Safety Officer for instructions.

## **CRITERIA FOR SAFETY MEASURES**

### ***CHEMICAL INVENTORY***

Chemical inventory should be maintained on a current basis and a copy of the inventory provided to the Departmental Chemical Hygiene Officer on an annual basis. THE DEPARTMENTAL SAFETY OFFICER WILL PROVIDE UPDATES TO THE CHEMICAL INVENTORY TO THE UTHSC OFFICE OF SAFETY AFFAIRS ON AN ANNUAL BASIS. THE CHEMICAL INVENTORY IS DUE DEC. 1 OF EACH YEAR.

A chemical inventory is performed quarterly, listing all the hazardous chemicals in the laboratory. Chemicals listed are those classified as hazardous by the Department of Transportation (DOT), the Environmental Protection Agency (EPA), or displaying a 2 or greater number in any section of the National Fire Protection Association (NFPA) diamond. DOT and EPA classifications are in Appendices C & D.

Chemicals are listed alphabetically by section according to the most commonly used name (e.g., bleach). A catalog number may be required by some manufacturers for MSDS. The average quantity in storage on a monthly basis, as well as the physical state (e.g., solid, liquid, gas), is included. The NEPA hazard classification, if known, is listed along with the manufacturer's

name and complete address. A comment section is provided to further identify the chemical's location (e.g., under the sink, third shelf in the safety cabinet, etc.) A chemical inventory form is provided in Appendix E.

Inventories are to be computerized whenever possible to provide the capability of sorting according to manufacturer or location. A complete chemical inventory is located in the office of the person responsible for this Chemical Hygiene Plan, as well as in the local fire department and State Department of Labor (TOSHA). A copy of the latest chemical inventories received will be

maintained in the office of Safety Affairs.

(NOTE: When chemical inventories are current, it serves

the purpose of keeping tighter control over chemicals kept within lab areas prevents excessive stock-piling of chemicals; thereby, greatly reducing the hazards involved, as well as significantly saving money by keeping only truly needed chemicals on hand. This also automatically reduces the amount of chemicals being disposed of, which provides additional savings.)

## *MATERIAL SAFETY DATA SHEETS*

Upon completion of the chemical inventory, Material Safety Data Sheets (MSDS) must be obtained for all chemicals listed on the inventory. MSDS may be obtained electronically or by written request to the manufacturer. A sample letter is in Appendix F.

Individualized MSDS manuals will be provided to each designated laboratory section, with the MASTER MSDS LIBRARY maintained by the Departmental Safety Officer.

The MSDS manuals will be kept in a 3-ring binder in each laboratory section. The MSDS are to be kept in alphabetical order along with a current chemical inventory listing placed in the front of each manual.

When a new chemical is introduced to the laboratory, IMMEDIATELY NOTIFY THE DEPARTMENTAL SAFETY OFFICER so proper training can be accomplished prior to the use of the chemical. At that point, the Departmental Safety Officer will determine if any special PPE or procedures are required.

The MSDS for each chemical is located in the office of the person responsible for this Chemical Hygiene Plan. An example of a MSDS is in Appendix G.

## *CHEMICAL STORAGE*

Storage of laboratory chemicals presents an ongoing safety problem. Some storage charts assume an unlimited amount of cabinets. **CHEMICALS CAN BE STORED ONLY IN APPROPRIATE CATEGORIES! SPECIAL ATTENTION MUST BE PAID TO ENSURE OXIDIZING AND OTHER REACTIVE CHEMICALS ARE NOT STORED CLOSE TO INTERACTIVE AGENTS!**

All flammable cabinets are to be individually vented to allow proper vapor dissipation.

Chemical storage quantities are kept as small as practical. Storage on bench tops and in hoods may cause potential exposure to fire and spills. Ventilated cabinets and specially monitored refrigerators are used for chemical storage only. No food is permitted in these refrigerators. Safety cans with a spring loaded spout are used for transporting flammable liquids.

Toxic chemicals, including carcinogens, are stored in ventilated storage areas in unbreakable chemical resistant secondary containers. These containers are labeled "CAUTION: HIGH CHRONIC TOXICITY OR CANCER-SUSPECT AGENT." A separate inventory list of carcinogens and suspected carcinogens is maintained by the Chemical Hygiene Officer according to federal and state regulations.

Cylinders of compressed gases are to be strapped or chained to a wall or bench top and are capped.

#### ***LABELING***

29 CFR 1910.1450 contains specific hazardous material container labeling requirements. Labels must be provided on all containers of hazardous chemicals that are shipped and used in the workplace. Labels must not be removed or defaced.

#### ***SHIPPING CHEMICALS***

Chemical manufacturers, importers, and distributors are subject to regulations requiring that each container of hazardous chemicals shipped is labeled, tagged, or marked with the following information:

1. Identity of the hazardous chemical
2. Appropriate hazard warnings
3. Name and address of the chemical company (i.e. manufacturer).

### *CHEMICALS IN THE LABORATORY*

#### STORAGE

Each hazardous chemical transferred from its original container into another container for storage must also be labeled. These workplace labels must contain:

1. Identity of the hazardous chemical
2. Route of entry (e.g., eyes, nose, mouth, skin)
3. Health hazard
4. Physical hazard
5. Target organ affected. (HMIG Target Organ Labels may be used when the manufacturer labels do not sufficiently cover necessary details.)

An example of a computer-generated label is shown below:

XXX LABORATORY

## ACETIC ACID

Route of Entry: Eyes, Skin, Nose

Health Hazard: Poison

Physical Hazard: Corrosive

Target Organs: Skin and Lungs

## USE

Any quantity of hazardous chemicals transferred from a storage container to any vessel (such as a flask) for use in the laboratory must be labeled to identify the contents of the vessel.

### *ENGINEERING CONTROLS*

All chemical fume hoods are inspected annually and certified by Physical Plant Engineering. Any hood not passing inspection is taken out of service immediately and not used until the hood has passed inspection. It is the responsibility of the employer to purchase the parts and to replace the unit in a timely fashion so as not to endanger the health and well-being of an employee or place the facility at risk.

Eyewash fountains are inspected every 3 months and records maintained by the Office of Safety Affairs.

Safety showers are inspected, tested, and flushed annually and records maintained by the Office of Safety Affairs.

Fire extinguishers are inspected monthly by the Office of Safety Affairs.

All chemical stockrooms/storerooms are adequate and well ventilated.

Ventilated storage cabinets for chemicals are provided as needed and have a separate exhaust duct.

Exhaust air from glove boxes and isolation rooms is passed through scrubbers or other treatment before being released into the regular exhaust system.

Cold rooms and warm rooms have provisions for rapid escape and also for escape in the event of electrical failure.

Air flow through the laboratory should be relatively uniform and exhausted to the exterior of the building. Quality and quantity of ventilation are monitored and records maintained by Plant Engineering.

All chemical hygiene-related equipment is periodically reviewed and modified if inadequate.

*CONTAMINATED WASTE REMOVAL/DISPOSAL*

To assure that no harm to people, other organisms, and the environment will result from the improper disposal of waste laboratory chemicals, the waste disposal program,(a copy of which is maintained in each laboratory area) specifies how waste is to be collected, segregated, stored, and transported and includes consideration of what materials can be incinerated. All disposal is done in accordance with the Tennessee Department of Environment and Conservation, Division of Solid Waste Management (TDEC). The Master Waste Disposal Program is to be maintained by the Departmental Safety Officer and re-evaluated on an annual basis.

## ADMINISTRATIVE CONTROLS

The Principal Investigator or Laboratory Manager is responsible for the safe operation of the area. All activities and procedures require approval by the person responsible for the Chemical Hygiene Plan and the Departmental Safety Officer before implementation. Environmental monitoring is required in

all laboratories for the following chemicals stored and/or used in the lab:

### 29 CFR 1910 Subpart Z

- 1910.1001 Asbestos, tremolite, anthophyllite, and actinolite
- 1910.1002 Coal tar pitch volatiles
- 1910.1003 4-Nitrobiphenyl
- 1910.1004 alpha-Naphthylamine
- 1910.1005 [Reserved]

1910.1006 Methyl chloromethyl ether

1910.1007 3,3'-Dichlorobenzidine (and its salts)

1910.1008 bis-Chloromethyl ether

1910.1009 beta-Naphthylamine

1910.1010 Benzidine

1910.1011 4-Aminodiphenyl

1910.1012 Ethyleneamine

1910.1013 beta-Propiolactone

1910.1014 2-Acetylaminofluorene

1910.1015 4-Dimethylaminoazobenzene

1910.1016 N-Nitrosodimethylamine

1910.1017 Vinyl chloride

1910.1018 Inorganic arsenic

1910.1025 Lead

1910.1028 Benzene

1910.1029 Coke oven emissions

1910.1043 Cotton dust

1910.1044 1,2-dibromo-3-chloropropane

1910.1045 Acrylonitrile

1910.1047 Ethylene oxide

1910.1048 Formaldehyde

1910.1101 Asbestos

All spills are contained according to EPA, TDEC, and OSHA guidelines, and appropriate spill kits are used. Upon request, the Safety Office will assist the laboratory in determining and obtaining the appropriate materials.

Assessment of significant risk of all operations is made by the Principal Investigator, Laboratory Manager or the person responsible for the Chemical Hygiene Plan. Chemical hygiene and safety policies will be established for each task performed and engineering controls or personal protective equipment assigned.

#### *RECORD KEEPING*

The UTHSC Occupational Health Coordinator has established and maintains an accurate record for each employee of environmental monitoring, medical consultations, and examinations, including tests or written opinions required.

Accident records are written and retained by the Departmental Safety Officer with a copy maintained in the individual's personnel file.

Inventory and usage records for high-risk substances are retained by each Principal Investigator and/or Laboratory Manager, as well as the Departmental Safety Officer, with a copy to the Office of Safety Affairs.

Environmental monitoring records are maintained by the Departmental Safety Officer and the Office of Safety Affairs.

Medical consultation records are maintained by the Departmental Safety Officer, with copies maintained in the individual's personnel file and with the Occupational Health Coordinator.

Training attendance records are maintained by the Departmental Safety Officer, with an annual report provided to the Office of Safety Affairs.

**EXCEPTION:**

When there is not a specified Departmental Safety Officer, full responsibility for all training and record-keeping becomes the responsibility of the Principal Investigators and Laboratory Managers.

All records are kept, transferred, and made available in accordance with 29 CFR 1910.20.

*PERSONAL PROTECTIVE EQUIPMENT*

Employees are required to wear gloves when the employee has the potential for direct skin contact with blood, hazardous chemicals, and infectious materials.

Lab coats are to be worn in the laboratory area and are to be buttoned to protect the employee's clothing. Lab coats are provided by the department.

In areas where chemical splashes are great (e.g., histology), an impervious apron appropriate for the task is worn.

All soiled personal protective equipment (lab coats) is removed immediately upon leaving the work area (or as soon as possible) and placed in an appropriate laundry hamper and laundered on site or by an outside contract service.

Masks and eye protection or chin-length face shields are worn to prevent splashes or sprays of blood, infectious materials, or hazardous chemicals if there is a potential for eye, nose, or mouth contamination. This equipment is provided to applicable employees at no cost.

Where the use of respirators is necessary to maintain exposure below permissible exposure limits, the employer provides, at no cost to the employee, the proper respiratory equipment.

The respirators shall be selected and used in accordance with the requirements of 29 DFR 1910.134. Training and fit testing are required for the use of the respirators and is performed by the Occupational Health Coordinator.

## ***TRAINING***

Training is a necessary and important part of the Chemical Hygiene Plan. All employees are trained at the time of the employee's initial assignment to a work area where hazardous chemicals are present and before assignments involving new exposure situations. Refresher information and retraining

sessions are held periodically - no less than annually. Training is conducted by the employee's immediate supervisor who was appropriately trained for this task by the person responsible for the Chemical Hygiene Plan. All training is documented in writing by attendance records or through reports generated from completion of UTHSC online safety training modules.

Before in-house training can begin, a lesson plan outlines the expectations of the program and the timeframe for the learning outcome. The lesson plan includes.

### **I. OBJECTIVES**

Upon completion of a laboratory employee's training plan, the employee will be able to:

- A. Locate the potentially hazardous chemicals in the workplace.
- B. Recognize the chemical labeling and its meaning.
- C. Locate the MSDS book in the workplace.
- D. Locate the health hazard, physical hazard, environmental protection, and special protection sections of the MSDS and explain their use.
- E. Identify the person responsible for the Chemical Hygiene Plan by name and title.
- F. Discuss the major components of the facility's standard labeling system.
- G. Identify the appropriate protective clothing for the area and demonstrate its use.
- H. Demonstrate emergency procedures in the event of a hazardous chemical spill.
- I. Describe the lab's area and employee monitoring protocol.

## II. ACTIVITY PLAN

### A. A list of training materials and instructions.

1. Videotape, on-line modules, others
2. Equipment instructions
3. Handouts

### B. Topics to be covered.

1. Content of the lab standard
2. Location of the CHP
3. Identification of hazardous chemicals
  - a. Location of chemical inventory
  - b. Location of MSDS
    - i. Obtaining a copy
  - c. Labeling information
    - i. Hazard warnings

- ii. Carcinogen warnings
  - iii. Location in workplace
  
- 4. Procedures for handling hazardous chemicals
  - a. Work practices.
  - b. Proper moving, storing, and use.
  - c. PEL for specific chemicals used by the employee.
  - d. Characteristics of chemicals used by the employee.
  - e. Environmental monitoring required.
  - f. Signs and symptoms of exposure.
  - g. Location of Target Organ Poster (Appendix G).
    - h. Protective equipment used to protect from overexposure.
  - i. Conditions to avoid
  
- 5. Environmental protection
  - a. Emergency procedures
  - b. Spill containment
  - c. Medical consultation procedures
  
- 6. Documentation of initial and annual training

### III SUMMARY

- A. Restate the objectives.
- B. Restate the main points.
- C. Answer any questions to clear up misunderstandings.

### **CHEMICALS REQUIRING APPROVAL FOR USE**

There are certain chemicals used that due to their particular hazardous nature require an evaluation of the proposed protective procedures before any activity involving handling of the

chemical is commenced. If you plan to work with any of the chemicals appearing on the attached listing, you must complete the Permission for Chemical Use form and submit to the person

responsible for the Chemical Hygiene Plan for review. The proposed procedure for safely handling the substance will be evaluated by the person responsible for the Chemical Hygiene Plan and a recommendation for approval or rejection by the Departmental Chairman will be drafted. In no circumstance can work with the chemical be started prior to granting of approval.

### **EXAMPLE ONLY - (ACUTELY HAZARDOUS CHEMICALS)**

The listing provided below is to provide an idea of the types of materials that should be considered as an acute hazard and would warrant approval before use. The person responsible for the Chemical Hygiene Plan should review the chemical inventory listing and designate the acutely hazardous materials actually present. The listing should be reviewed as necessary to keep it up-to-date.

**Toxic Gases**

Carbon monoxide

Arsine

Fluorine

Hydrogen cyanide

Hydrogen selenide

Phosphine

**Acutely Toxic Compounds**

Dioxin

Ricin

Plutonium

Cyanide Compounds

Pesticides

**Shock Sensitive Compounds**

Picramide

**Nitro Compounds**

Nitroglycerin

Benzoyl peroxide

Acetyl peroxide

Benzotrichloride

**Highly Corrosive Compounds**

Picric acid

Benzenesulfonic acid

Chloride

Hydrofluoric acid

Methanoic acid

Ethanoyl chloride

**Extremely Flammable Compounds**

Carbonyl sulphide

Carbon monoxide

Ethylene oxide

Arsine

Di-n-propylamine

#### *MEDICAL CONSULTATIONS AND EXAMINATIONS*

All employees needing medical attention shall report to University Health Services, located at 910 Madison Avenue, Suite 922, telephone 448-5630.

All medical examinations and consultations are performed by or under the direct supervision of a licensed physician without cost to the employee, without loss of pay, and at a reasonable time and place. A board-certified physician in occupational medicine is used whenever possible.

The employee is sent for medical evaluation:

1. Whenever signs and symptoms associated with a hazardous chemical develop.
2. When environmental monitoring reveals an exposure level routinely above the action level.
3. Whenever an event takes place in the work area such as spill, leak, or explosion resulting in hazardous chemical exposure.

The laboratory provides the following information to the physician:

1. Identify of the hazardous chemical(s) to which the employee may have been exposed.
2. A description of the conditions under which the exposure occurred- including quantitative exposure data (if available)
3. A description of the signs and symptoms of exposure
4. A copy of the MSDS for the chemical(s) involved.

University Health Services provides a written opinion to the employee, supervisor and Safety Officer that will not reveal specific finding of diagnosis unrelated to the exposure but will include:

1. Any recommendation for further medical follow-up
2. Results of the medical examination and any associated tests
3. Any medical conditions that may be revealed in the course of the examination that may place the employee at increased risk as a result of exposure to a hazardous chemical found in the workplace.

4. A statement by the physician that the employee has been informed of the consultation/examination results and any medical condition that may require further examination or treatment.

#### *CHEMICAL HYGIENE PLAN RESPONSIBILITIES*

The chemical hygiene responsibilities for a specific laboratory rest with the person who is appointed by the Principal Investigator or the Laboratory Manager and receives backing from the department chairman. This person must:

- Work with administrators and other employees to develop and implement appropriate chemical hygiene policies and practices.
- Certify the performance of protective equipment
- Monitor procurement, use, and disposal of chemicals used in the lab
- See that appropriate audits are maintained
- Help project directors develop precautions and adequate facilities
- Know the current legal requirements concerning regulated substances
- Seek ways to improve the chemical hygiene program.

The immediate supervisor has overall responsibility to:

- Ensure that workers know and follow the chemical hygiene rules,
- that protective equipment is available and in working order, and that
- appropriate training has been provided
- Provide regular, formal chemical hygiene and housekeeping inspections
- including routine inspections of emergency equipment
- Know the current legal requirements concerning regulated substances
- Determine the required levels of protective apparel and equipment
- Ensure that facilities and training for use of any material being ordered are adequate.

The laboratory employee is responsible for:

- Planning and conducting each operation in accordance with the institutional chemical hygiene procedures.
- Developing good personal chemical hygiene habits.

In order to assure compliance with the University of Tennessee Safety Policies, the UT Memphis Safety Officer has the authority to initiate action to close down a laboratory if they are not meeting the requirements of the UT Memphis Chemical Hygiene Plan.

#### *PROVISIONS FOR ADDITIONAL EMPLOYEE PROTECTION*

RESERVED

#### **ADDITIONAL SAFETY REQUIREMENTS OTHER THAN FOR HAZARDOUS CHEMICALS**

1. Dispose of glass and sharp objects in authorized safety disposal containers.

2. Dispose of all biologically contaminated waste in biohazard (red) bags.
3. Non-contaminated waste is to be disposed of in regular trash, NOT IN BIO-BAGS. Placing routine items in biological bags cost the department needlessly.
4. Corridors are to remain unobstructed at all times. All carts or other mandatory objects placed within authorized hallways should be placed on the same side of the halls, allow smooth flow of traffic in and out of the laboratory area.
5. NEVER obstruct exits, fire extinguishers, firehouses, gas valves, etc.
6. Doors into laboratory areas are to remain shut at all times unless held open by Fire Marshall approved magnetic door openers. NEVER PROP DOORS WITH UNAUTHORIZED OBJECTS (e.g. rubber or wooden door stops)!
7. Make sure equipment is properly grounded and that the wiring of all equipment is in good condition. If cracks in insulation or exposure of the wiring are noticed, IMMEDIATELY UNPLUG THE EQUIPMENT AND NOTIFY YOUR IMMEDIATE SUPERVISOR and DEPARTMENTAL SAFETY OFFICER.
8. In any case of exhaust failure, IMMEDIATELY NOTIFY YOUR IMMEDIATE SUPERVISOR and DEPARTMENTAL SAFETY OFFICER. If personnel are in danger of contamination by toxic or infectious agents, IMMEDIATELY REMOVE ALL PERSONNEL FROM THE AREA, CLOSING OFF THE AREA UNTIL THE PROBLEM HAS BEEN PROPERLY RESOLVED.
9. Chemical Storage Cabinets are to be placed at least six feet away from laboratory exits.

## ***GLOSSARY***

The following terms are used as part of the Chemical Hygiene Program:

**ACUTE**            An adverse effect with symptoms of high severity coming quickly to a crisis.

**CARCINOGEN**    A substance capable of causing cancer.

**CHEMICAL AGENTS** A wide variety of fluids that have a high potential for body entry by various means. Some are more toxic than others and require special measures of control for safety and environmental reasons.

**CHRONIC** Adverse effects with symptoms that develop slowly over long period of time or that frequently recur.

**COMBUSTIBLE** Able to catch on fire and burn.

**DOT** Department of Transportation

**EPA** Environmental Protection Agency

**FLAMMABLE** Capable of being easily ignited and of burning with extreme rapidity.

**INFECTIOUS AGENTS** Sources that cause infections either by inhalation, ingestion, or direct contact with the host material.

**LC 50** The concentration of a substance in air that causes death in 50% of the animal exposed by inhalation. A measure of acute toxicity.

**LD 50** Dose that causes death in 50% of the animals exposed by swallowing a substance. A measure of acute toxicity.

**MSDS** Material Safety Data Sheet

**MUTAGEN** Capable of changing cells in such a way that future cell generations are affected. Mutagenic substances are usually considered suspect carcinogens.

**OSHA** Occupational Safety and Health Administration, the regulatory branch of the Department of Labor concerned with employee safety and health.

**PEL** Permissible Exposure Limit. This is the legally allowed concentration in the workplace that is considered a safe level of exposure for an 8-hour shift, 40 hours per week.

**pH** A measure of how acidic or caustic a substance is on a scale of 1 to 14. A pH of less than 7 is acidic; and a pH greater than 7 is basic.

**PHYSICAL AGENTS** Workplace sources recognized for their potential effects on the body. Heat exposure or excessive noise levels are examples of this risk group.

**SENSITIZERS** Agents to repeated exposure over time creating an allergic reaction at some point in time.

STERILITY Changes made in male or female reproductive systems resulting in inability to reproduce.

TERATOGEN substance that causes a deformity in newborns if a significant exposure exists during pregnancy.

TLV Threshold Limit Value. The amount of exposure allowable for an employee in an 8-hour day.

#### *APPENDICES*

IN DEVELOPMENT