

Chapter 13

Chemical Hygiene Plan

13-1. General

a. The Chemical Hygiene Plan (CHP) establishes the minimum regulatory requirements for safe use of hazardous chemicals in the laboratory. Chemical exposure shall be minimized through the use of engineering controls, work practices, and protective equipment and clothing.

b. This CHP applies to all chemical laboratories within CASCOTM to include Quartermaster, Ordnance, and Transportation School, and all tenant activities assigned to Fort Lee.

c. Minimize all chemical exposures. Because few laboratory chemicals are without hazards, general precautions for handling all laboratory chemicals should be adopted, rather than specific guidelines for particular chemicals. Skin contact with chemicals should be avoided as a cardinal rule.

d. Do not underestimate the risk. Even for substances of no known significant hazard, exposure should be minimized; for work with substances that present special hazards, special precautions should be taken. One should assume that any mixture will be more toxic than its most toxic component and that all substances of unknown toxicity are toxic.

e. Provide adequate ventilation. The best way to prevent exposure to airborne substances is to prevent their escape into the working atmosphere by use of hoods and other ventilation devices.

f. Laboratory personnel shall not be exposed to airborne concentrations that exceed the more stringent of either the Permissible Exposure Limit (PEL) or Threshold Limit Value (TLV) for a specific compound or mixture IAW AR 40-5. A list of PELs and TLVs is found in 29 CFR part 1910-1000, subpart Z.

13-2. Responsibilities

a. Activities/directorates with laboratories will appoint a Chemical Hygiene Officer (CHO).

b. CHO will:

(1) Develop a CHP and implement guidance for handling hazardous chemicals in the laboratory IAW 29 CFR 1910.1450. Program will be reviewed by the Installation Safety Office and Preventive Medicine Service prior to approval.

(2) Review the CHP at least annually and revise the document as necessary to reflect current regulatory practice.

(3) Review SOPs for all laboratory operations using hazardous chemicals.

(4) Conduct pre-operational surveys of all new laboratory operations using hazardous chemicals.

(5) Request annual surveys from Preventive Medicine Service.

(6) Maintain an inventory of chemicals routinely used in the laboratory and of chemicals that are stored. The inventories should reflect quantity estimates and location of storage. The Installation Safety Office will annually request an up-to-date Chemical Inventory Log.

(7) Provide training to all employees on the hazards associated with the laboratory operations and maintain records of such training.

(8) Maintain Safety Data Sheets (SDSs) for all chemicals on the chemical inventory. The SDSs should be available so employees have easy access to them.

c. Environmental Management Office will:

(1) Provide guidance on hazardous waste handling and disposal.

(2) Conduct inspections of all laboratories where hazardous waste is generated or stored.

(3) Review plans and specifications for construction to ensure environmental regulatory requirements are met and pollution abatement measures are included.

d. Preventive Medicine Service will:

(1) Review CHP and SOP for all laboratory operations using hazardous chemicals.

(2) Review plans and specifications for all laboratory construction to ensure industrial hygiene requirements are met.

(3) Conduct annual industrial hygiene surveys in laboratories where hazardous chemicals are used IAW AR 40-5 and TB Med 503.

(4) Maintain the Health Hazard Information Module (HHIM) data base for all laboratories IAW AR 40-5 and TB Med 503.

(5) Conduct air sampling of laboratory operations where there is a reasonable probability that employee exposure exceeds the action level for a chemical IAW 29 CFR 1910.1045 and AR 40-5.

(6) Conduct pre-placement, pre-assignment, and periodic job-related medical surveillance for military and Civilian employees potentially exposed to hazardous chemicals IAW AR 40-5.

e. Installation Safety Office will conduct periodic safety inspections of all laboratories.

f. Supervisors will:

(1) Ensure an SOP is prepared for all laboratory operations using hazardous chemicals.

(2) Ensure laboratory personnel receive job-related medical surveillance as identified by the Preventive Medicine Service.

(3) Ensure personnel working with hazardous chemicals are trained on the health and safety aspects of their jobs.

(4) Ensure personnel have received hazard communication training IAW 29 CFR 1910.1200.

(5) Ensure personnel are provided and have received adequate training in the use of personal protective equipment necessary for the operations.

(6) Perform daily inspections of laboratory operations using hazardous chemicals to ensure compliance with the SOP, the CHP, and applicable regulations.

(7) Ensure hazardous waste handlers receive annual hazardous waste training.

g. Laboratory personnel will:

(1) Plan and conduct laboratory operations using hazardous chemicals in accordance with procedures found in the SOP, the CHP, and applicable regulations.

(2) Report hazardous conditions, exposure, or abnormal circumstances associated with an operation to their supervisor.

(3) Report for any job-related medical surveillance examinations.

(4) Manage laboratory waste in accordance with applicable environmental regulations.

h. Acutely toxic compounds, carcinogens and reproductive toxins shall be handled using the special procedures found in appendix A of 29 CFR Part 1910.1450.

13-3. Inventories

a. Inventories shall be available for each room where chemicals are stored or handled. The inventory shall be maintained by the room custodian and list the chemical name, quantity, container type, storage code, date received and expiration date, if applicable.

b. Inventories shall be available, kept current, and provided to the Installation Safety Office and Preventive Medicine Service.

c. Copies of the inventories for a single laboratory building shall be maintained in a central location(s) accessible to firefighters or other response personnel in the event of an emergency.

d. SDS for each chemical on the inventory must be available for workers in the laboratory.

13-4. Personal protective equipment (PPE)

The following PPE shall be available in each laboratory. Follow OSHA standards on use of all personal protective equipment.

a. Protective apparel compatible with the required degree of protection for substances being handled.

b. An easily accessible drench-type safety shower and eyewash. Design and installation shall comply with the latest edition of ANSI/ISEA Standard Z358.1 - 2009.

c. A fire extinguisher.

d. Respiratory protection, fire alarm, and telephone for emergency use should be available. Selection and use of respirators shall be IAW AR 11-34, TB MED 502, and this regulation.

e. Other items designated by the laboratory supervisor.

13-5. Air monitoring

Air monitoring shall be conducted when there is a reasonable probability that employee exposure exceeds the action level for a chemical IAW 29 CFR 1910.1045 and AR 40-5.

13-6. Information and training

a. Personnel shall be provided with information and training to ensure they are apprised of chemical hazards in the laboratory. The following health and safety information shall be provided:

(1) Contents of the OSHA Laboratory Standard and its appendixes.

(2) Location and availability of the Chemical Hygiene Plan.

(3) PELs for OSHA regulated substances.

(4) Signs and symptoms associated with exposure to hazardous chemicals used in the laboratory.

(5) Location and availability of reference material including SDSs.

b. Personnel handling hazardous chemicals shall be trained. Training shall include the following:

- (1) Details of the Chemical Hygiene Plan.
- (2) Methods and observations that may be used to detect the presence of hazardous chemicals.
- (3) Physical and health hazards of chemicals used in the laboratory.
- (4) Measures personnel can take to protect themselves from these hazards including use of engineering controls, work practices, and personal protective equipment.

13-7. Hazard communication

Training in hazard communication shall be conducted in accordance with the Installation Hazard Communication Program.

13-8. Medical program

a. Regular medical surveillance shall be established to the extent required by regulations. Consult the Preventive Medicine Services.

b. *Routine surveillance.* Anyone whose work involves regular and frequent handling of toxicologically significant quantities of a chemical should consult the Preventive Medicine Services to determine on an individual basis whether a regular schedule of medical surveillance is necessary.

c. For emergencies, call 911.

13-9. Spills and accidents

a. A written emergency action plan shall be established and communicated to all personnel. It should include procedures for ventilation failure, evacuation, medical care, reporting, and drills.

b. There shall be an alarm system to alert people in all parts of the facility including isolation areas.

c. A spill control policy shall be developed and should include consideration of prevention, containment, cleanup, and reporting. Refer to the internal SOP.

d. All accidents or near accidents shall be reported to the Installation Safety Office and carefully analyzed with the results distributed to all who might benefit.

13-10. Waste disposal program

a. Laboratory wastes shall be handled and disposed of in accordance with applicable federal, state and local environmental regulations and policies.

b. Chemicals shall be handled and stored in such a way that their identity is retained from initial receipt or production to use or ultimate destruction whenever feasible. When chemicals are combined and become part of a laboratory waste mixture, a record of all chemicals in the mixture shall be maintained.

c. SDSs will be maintained on all chemical wastes and provided to the Property Disposal Officer or Environmental Management Office when turned in.

13-11. Emergencies

a. Laboratory buildings shall have a written emergency action plan that includes the following elements:

(1) *Evacuation procedures.* Primary and alternate routes shall be established as necessary and communicated to personnel. Outside assembly areas shall be designated.

(2) *Shutdown procedures.* Instructions for shutting down equipment or apparatus in the event of an emergency shall be documented in SOPs.

(3) *Return procedures.* Procedures shall be developed to ensure personnel do not re-enter the laboratory before the emergency is over.

b. *Fires.*

(1) Laboratory personnel shall not attempt to extinguish large fires. The following steps should be taken:

(a) Confine the fire by closing the hood sash or laboratory doors and fire doors as appropriate.

(b) Immediately evacuate the fire area and call 911.

(2) Incipient stage fires may be extinguished by designated laboratory personnel trained in the use of portable fire extinguishers IAW 29 CFR 1910.157. At least two personnel shall be available when the fire is extinguished. The following steps should be taken:

(a) Alert other personnel and have them notify Fire and Emergency Services.

(b) Extinguish the fire by directing the discharge at the base of the flames.

(c) If the fire cannot be controlled, evacuate the area and implement the guidance in paragraph b(1) above.

c. *Ventilation failure.*

(1) Operations shall be terminated in a safe manner in the event of a low flow condition or complete ventilation failure.

(2) Personnel shall not re-enter the laboratory until ventilation has been restored for at least 30 minutes.

(3) In cases where the operation could not be terminated and there is a reasonable probability that the laboratory atmosphere is unsafe, air monitoring may be necessary before re-entry.

13-12. Records

a. Accident reports will be sent to the Installation Safety Office.

b. Inventory and usage records for high-risk substances will be maintained by the using section.

c. Medical records will be retained by Preventive Medicine Service in accordance with the requirements of state and federal regulations.

13-13. Signs and labels

Prominent signs and labels will be posted.

a. Telephone numbers of emergency personnel/facilities, supervisors, and laboratory workers.

b. Labels showing contents of containers, including waste receptacles, and associated hazards.

c. Location signs for safety showers, eyewash stations, other safety and first aid equipment, exits, and areas where food and beverage consumption and storage are permitted.

d. Warnings at areas or equipment where special or unusual hazards exist.

13-14. Basic rules and procedures

In addition to the procedures mentioned above, laboratory workers will also follow the rules listed below.

a. *Accidents and spills.*

(1) *Eye Contact.* Promptly flush eyes with water for 15 minutes and seek medical attention.

(2) *Ingestion.* Encourage the victim to drink large amounts of water.

(3) *Skin Contact*. Promptly flush the affected area with water and remove any contaminated clothing. If symptoms persist after washing, seek medical attention.

(4) *Clean-up*. Promptly clean up spills, using appropriate protective apparel and equipment and proper disposal.

b. *Avoidance of routine exposure*. Develop and encourage safe habits and avoid unnecessary exposure to chemicals by any route.

(1) Do not smell or taste chemicals. Use a vent apparatus, such as vacuum pumps, distillation columns, etc., to discharge toxic chemicals into local exhaust devices.

(2) Inspect gloves and test boxes before use.

(3) Do not allow release of toxic substances in cold rooms and warm rooms since these have contained re-circulated atmospheres.

c. *Choice of chemicals*. Use only those chemicals for which the quality of the available ventilation system is appropriate.

d. *Eating, smoking; etc.* Avoid eating, drinking, smoking, gum chewing, or application of cosmetics in areas where laboratory chemicals are present. Wash hands before conducting these activities. Avoid storage, handling, or consumption of food or beverages in storage areas, refrigerators, glassware, or utensils that are also used for laboratory operations.

e. *Equipment and glassware*. Handle and store laboratory glassware with care to avoid damage and do not use damaged glassware. Use extra care with Dewar flasks and other evacuated glass apparatus and shield or wrap them to contain chemicals and fragments should implosion occur. Use equipment only for its designed purpose.

f. *Exiting*. Wash areas of exposed skin well before leaving the laboratory.

g. *Horseplay*. Avoid practical jokes or other behavior that might confuse, startle, or distract another worker.

h. *Mouth suction*. Do not use mouth suction for pipetting or starting a siphon.

i. *Personal apparel*. Confine long hair and loose clothing. Wear shoes at all times in laboratory but do not wear sandals, perforated shoes, or sneakers.

j. *Housekeeping*. Keep the work area clean and uncluttered, with chemicals and equipment being properly labeled and stored. Clean up the work area on completion of an operation or at the end of each day.

k. *Personal protection*. Assure that appropriate eye protection is worn by all persons, including visitors, where chemicals are stored or handled. 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. Use appropriate respiratory equipment when air contaminant concentrations are not sufficiently restricted by engineering controls, inspecting the respirator before use. Use any other protective and emergency apparel and equipment as appropriate. Avoid use of contact lenses in the laboratory unless necessary; if they are used, inform supervisor so special precautions can be taken. Remove laboratory coats immediately on significant contamination.

l. *Planning*. Seek information and advice about hazards, plan appropriate protective procedures, and plan positioning of equipment before beginning any new operation.

m. *Unattended operations*. 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, to an unattended operation.

n. *Use of hood*. Use the hood for operations which might result in release of toxic chemical vapors or dust.

o. *Vigilance*. Be alert to unsafe conditions and see that they are corrected when detected.

p. *Waste disposal*. Assure that the plan for each laboratory operation includes plans and training for waste disposal.

q. *Working alone*. Avoid working alone in a building; do not work alone in a laboratory if the procedures being conducted are hazardous.

13-15. Safety recommendations

The above rules do not include those that are directed primarily toward prevention of physical injury rather than toxic exposure. However, failure of precautions against injury will often have the secondary effect of causing toxic exposures.