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## I. RULES AND REGULATIONS GOVERNING HEALTH AND SAFETY

### A. ***Occupational Exposure to Hazardous Chemicals in Laboratories Regulation***

The Federal Occupational Safety and Health Administration (OSHA) regulation entitled *Occupational Exposure to Hazardous Chemicals in Laboratories*, commonly called the "Lab Standard" or the "Chemical Hygiene Regulation" is codified at 29 CFR 1910.1450. In Oklahoma, this regulation has been adopted and is enforced by the Oklahoma Public Employee Occupational Safety and Health division of the Oklahoma Department of Labor (DOL).

#### 1. Scope and Applicability

- a. This regulation applies to all employees engaged in the laboratory use of hazardous chemicals.
- b. "Laboratory" is defined by OSHA as a facility where the "laboratory use of hazardous chemicals" occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.
- c. "Laboratory scale" means work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person. "Laboratory scale" excludes those workplaces whose function is to produce commercial quantities of materials.
- d. Laboratory uses of hazardous chemicals which provide no potential for employee exposure are excluded. Examples of such conditions might include:
  - (1) procedures using chemically-impregnated test media such as dip sticks and test strips, and/or
  - (2) commercially prepared kits such as those used in performing pregnancy tests in which all of the reagents needed to conduct the test are contained in the kit.

#### 2. Purpose

- a. The purpose of this regulation is to assure that laboratory employees' exposure to any regulated substance does not exceed OSHA permissible exposure limits (PELs) listed in 29 CFR 1910.1000.
- b. Air monitoring will be performed for those substances suspected to routinely exceed the listed action level, or in the absence of an action level, the PEL.

- (1) Initial monitoring is required to determine airborne concentrations.
- (2) Periodical monitoring is required if initial monitoring indicates elevated levels.
  - (a) Monitoring will occur when employees notify the Environmental Health and Safety Office (EHSO) of the following situations where exposures are suspected to exceed the PEL:
    - (3) where the employees are exhibiting signs and symptoms of overexposure,
    - (4) where large quantities of specific chemicals must be handled,
    - (5) when engineering control measures such as fume hoods are not available,
    - (6) where highly toxic materials are being used,
    - (7) when a spill has occurred, or
    - (8) whenever an employee suspects the airborne concentration to be above the PEL.
- c. Employees must be notified of exposures within 15 working days of receipt of laboratory results.

### 3. Chemical Hygiene Plan

Laboratory supervisors must develop and carry out the provisions of a written Chemical Hygiene Plan (CHP) for their laboratory. Supervisors may use this *OU Laboratory Safety Manual* as a guidance document for its preparation.

- a. The CHP must be:
  - (1) capable of protecting employees from health hazards in the laboratory, and
  - (2) capable of keeping exposures below PELs.
- b. The CHP should be readily available to employees.
- c. The CHP should indicate specific measures that will be taken to ensure laboratory employee protection and should include each of

the following elements:

- (1) standard operating procedures relevant to health and safety to be followed in the laboratory;
- (2) criteria utilized to determine and implement control measures to reduce employee exposure (the criteria used to determine whether exposure monitoring is indicated is provided in Section I.A.2.b. above);
- (3) a requirement that fume hoods and other protective equipment are functioning properly;
- (4) employee training provisions;
  - (a) Initial training and training prior to new exposures is required.
  - (b) Refresher training frequency is not specified, but since the *Oklahoma Hazard Communication Standard* requires annual refresher training, this may be performed together.
  - (c) The EHSO will provide initial and annual refresher training to laboratory personnel.
  - (d) Training contents must include:
    - i) applicable regulations,
    - ii) location of Chemical Hygiene Plan,
    - iii) OSHA PELs,
    - iv) signs or symptoms of exposure to hazardous materials used in the laboratory,
    - v) location of MSDSs,
    - vi) methods used for detection of presence or release of hazardous chemicals,
    - vii) physical and health hazards of chemicals in the work area,
    - viii) protective measures available to employees, and
    - ix) details of the written chemical hygiene plan.
- (5) designation of circumstances under which a particular laboratory operation, procedure, or activity requires prior approval from the laboratory supervisor before implementation;
- (6) medical examinations and consultations;

- (a) OU will provide all employees an opportunity to receive medical attention, including any follow-up examinations, under the following circumstances:
    - i) whenever an employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory, or
    - ii) where exposure monitoring reveals an exposure level routinely above the action level, if applicable.
  - (b) Whenever an event takes place in the work area such as a spill, leak, explosion or other occurrence resulting in the likelihood of a hazardous exposure, the affected employee will be provided an opportunity for a medical consultation. Such consultation will be for the purpose of determining the need for a medical examination.
  - (c) All medical examinations and consultations should be performed by or under the direct supervision of a licensed physician and should be provided without cost to the employee, without loss of pay, and at a reasonable time and place.
  - (d) Exposure records will be retained by the EHSO for 40 years. The University's designated occupational health service provider should retain medical records for 30 years.
  - (e) If an employee or their representative requests a copy of the employee's health record, OU must provide a copy within 15 days of the request, provide facilities to make copies at no cost, or to loan records so that copies can be made. Coordination of this may be arranged with the EHSO.
- (7) designation of a Chemical Hygiene Officer responsible for implementation of the CHP; and
  - (8) provisions for additional employee protection for work with particularly hazardous substances. These include "select carcinogens," reproductive toxins and substances which have a high degree of acute toxicity. Specific consideration should be given to the following provisions

which should be established where appropriate:

- (a) establishment of designated area,
  - (b) use of containment devices such as fume hoods or glove boxes,
  - (c) procedures for safe removal of contaminated waste, and decontamination procedures.
- d. The laboratory supervisor or department head should review and evaluate the effectiveness of the Chemical Hygiene Plan at least annually and update it as necessary. The EHSO will evaluate this *Laboratory Safety Manual* at least annually and will update it as necessary.
4. Hazard Identification
- a. Labels on incoming containers of hazardous chemicals should not be removed or defaced.
  - b. All containers in the laboratory must be properly labeled as required by the OU *Hazard Communication Policy and Program*.
  - c. MSDSs for hazardous chemicals used in the laboratory must be maintained and readily accessible to laboratory employees.
  - d. The following provisions should apply to chemical substances developed in the laboratory:
    - (1) If the composition of the chemical substance which is produced exclusively for the laboratory is known, a determination should be made as to whether the substance is a hazardous chemical. If the chemical is determined to be hazardous, the substance should be included in the CHP and appropriate training should be provided.
    - (2) If the chemical produced is a by-product whose composition is not known, it should be assumed that the substance is hazardous and the substance should be included in the CHP.
    - (3) If the chemical substance is produced for another user outside the laboratory, the laboratory should comply with the Oklahoma Hazard Communication Standard including the requirements for preparation of a MSDS and labeling.

## 5. Respirator Use

If, after reasonable engineering controls have been implemented, the use of respirators is still necessary to maintain exposure below PELs, the department should provide, at no cost to the employee the proper respiratory equipment. If respirators must be used, a written respirator program must be in place, the employee must have received a medical examination to ensure physical capability to wear the respirator, and documented respirator training and fit testing must occur on a regular basis. Departments are encouraged to consult with the EHSO prior to assigning respirators to laboratory employees.

## 6. Responsibilities

a. The Chemical Hygiene Officer is responsible for:

- (1) working with administrators and other employees to develop and implement appropriate chemical hygiene policies and practices,
- (2) monitoring procurement, use, and disposal practices of chemicals used in the laboratory,
- (3) ensuring that appropriate audits are maintained,
- (4) reviewing renovation and other major projects to ensure precautions and adequate facilities are provided,
- (5) maintaining current knowledge of the legal requirements concerning regulated substances, and
- (6) reviewing and implementing ways to improve the chemical hygiene program.

b. The supervisor of the department or other administrative unit is responsible for:

- (1) ensuring that workers know and follow the chemical hygiene rules,
- (2) ensuring that protective equipment is available and in working order,
- (3) ensuring that all containers in the work area are properly labeled,
- (4) ensuring that MSDSs are maintained for each hazardous substance in the laboratory and ensuring that they are readily accessible to laboratory employees,

- (5) ensuring that appropriate training has been provided to all employees,
  - (6) providing regular, formal chemical hygiene and housekeeping inspections including routine inspections of emergency equipment,
  - (7) knowing the current legal requirements concerning regulated substances,
  - (8) determining the required levels of protective apparel and equipment, and
  - (9) ensuring that facilities for use of any material being ordered are adequate.
- c. The laboratory worker is responsible for:
- (1) planning and conducting each operation in accordance with the institutional chemical hygiene procedures, and
  - (2) developing good personal chemical hygiene habits.

## 7. Recordkeeping

Records of any measurements taken to monitor employee exposures and any medical consultation and examinations including tests or written opinions required by this standard must be maintained for a minimum of 30 years. Laboratories may use Chapter XVII., "Air Monitoring Data" and Chapter XVIII., "Medical Monitoring Data" for recordkeeping of such documents.

Sources: OSHA *Occupational Exposure to Hazardous Chemicals in Laboratories* Standard (29 CFR 1910.1450)  
*Oklahoma Hazard Communication Standard*

## B. Other Regulations and Standards

A multitude of other Federal, State and local standards, regulations, and guidelines apply to the laboratory setting. Requirements of these standards and regulations have also been incorporated into this compliance document, including procedures to comply with regulations addressing hazardous waste management and air and water pollution prevention, packaging and shipping of infectious materials and medical waste, and biosafety guidelines. These standards, regulations, and guidelines include, but are not limited to, the following.

1. Oklahoma Department of Labor (DOL) *Oklahoma Hazard Communication Standard*
2. Oklahoma DOL/OSHA *Bloodborne Pathogens Standard*

3. Oklahoma DOL/OSHA *Formaldehyde* Standard
4. Environmental Protection Agency (EPA) Clean Air Act
5. EPA Clean Water Act
6. EPA Toxic Substance Control Act
7. EPA Resource Conservation and Recovery Act (RCRA)
8. EPA Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)
9. EPA Superfund Amendments and Authorizations Acts (SARA)
10. Oklahoma Department of Environmental Quality Solid Waste Regulations
11. National Fire Protection Association (NFPA)
12. American National Standards Institute (ANSI) Guidelines
13. Compressed Gas Association Guide
14. American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) Guidelines
15. The Centers for Disease Control and Prevention (CDC)/National Institutes of Health (NIH) *Biosafety in Microbiological and Biomedical Laboratories* Guidelines
16. NIH *Guidelines for Recombinant DNA Research*
17. Department of Transportation (DOT) Regulations for Transport of Infectious Materials and Medical Waste.