



NORTH CAROLINA Office of
State Human Resources

OFFICE OF STATE HUMAN RESOURCES

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SUBJECT: Chemical Hygiene/Lab Safety Program

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RELATED LEGISLATION:

North Carolina Occupational Safety and Health Standards for General Industry, 29 CFR 1910.1450.
Other OSHA Standards may apply.

I. PROGRAM STATEMENT

The general intent of the chemical hygiene plan for [Agency/University] is to protect laboratory employees from health hazards associated with the use of hazardous chemicals in our laboratory and to assure that our laboratory employees are not exposed to substances in excess of the permissible exposure limits as defined by OSHA in 29 CFR 1910 Subpart Z.

The plan will be available to all employees for review and a copy will be located in the following areas:

This plan will be reviewed annually by _____ (insert name or position), and updated as necessary.
_____ (insert name) is designated as the Chemical Hygiene Officer (CHO). (See sections VI and VII for details.)

II. STANDARD OPERATING PROCEDURES to be followed in the laboratory relevant to safety and health when using chemicals.

(These are general procedures of laboratory operation which you likely already have in effect. Section E of Appendix A or 1910.1450 list the following conditions.)

- A. Accidents, spills;
- B. Avoidance of routine exposure;
- C. Choice of chemicals;
- D. Eating, drinking, smoking, etc.;
- E. Equipment and glassware;
- F. Exiting;
- G. Horseplay;
- H. Mouth suction;
- I. Personal apparel;
- J. Personal housekeeping;
- K. Personal protection;
- L. Planning;
- M. Unattended operations;
- N. Use of hood;
- O. Vigilance;
- P. Waste disposal and storage; and
- Q. Working alone.

(Section F of Appendix A of 1910.1450 includes additional safety recommendations.)

- A. Corrosive agents;
- B. Electrically powered laboratory apparatus;
- C. Fires, explosions;
- D. Low temperature procedures;
- E. Pressurized and vacuum operations;
- F. Compressed gases; and
- G. Chemical storage.

Attached to this plan, in Appendix ____, are the standard operating procedures in place at _____ (insert company name) for the safe handling of chemicals in our laboratory.

(Often this will be your laboratory safety manual which is already in place.)

(If you have the following programs, they can also be referenced.)

The written portion of the laser safety program is located in/at _____.

The written portion of the radiation safety program is located in/at _____.

The written portion of the biological safety program is located in/at _____.

III. CRITERIA FOR USE OF CONTROL MEASURES TO REDUCE EMPLOYEE EXPOSURE TO HAZARDOUS CHEMICALS

- A. The following operations shall be performed in LABORATORY FUME HOODS:

B. The following operations shall be performed in BIOLOGICAL SAFETY CABINETS:

C. The following operations shall be performed in GLOVE BOXES:

D. Respirators shall be used in accordance with the respiratory protection policy of _____ (insert company name), and with the OSHA respirator standard 29 CFR 1910.134. This policy and associated documentation is filed _____ (insert location) for employee review.

E. Appropriate protective apparel compatible with the required degree of protection for substances handled shall be used. _____ (insert name of position) will advise employees on glove, gown, eye protection, barrier creams, etc. use. Permeability charts are available _____ (insert location).

F. Employees will be instructed on the location and use of eye wash stations and safety showers. _____ (insert name of position) is responsible for this instruction.

G. Employees will be trained _____ (insert how often, example annually) on the use of fire extinguishers and other fire protection systems.

IV. MAINTENANCE OF FUME HOODS AND OTHER PROTECTIVE EQUIPMENT

a. FUME HOODS will be inspected every ____ months by _____ (insert name of position); adequacy of face velocity will be determined by _____ (insert method here); reports of hood inspections are filed _____ (insert location) for employee review.

(Repeat the above for each additional major category of protective equipment, such as BIOLOGICAL SAFETY CABINET, VENTILATION OF STORAGE CABINETS, INTERLOCKS ON HIGH VOLTAGE EQUIPMENT, SAFETY SHOWERS, EYEWASH STATIONS, etc., indicating how often they are inspected, by whom, what is measured, and where the inspection records and checklists are filed).

V. EMPLOYEE INFORMATION AND TRAINING

- a. Each employee covered by the laboratory standard will be provided with information and training so that they are apprised of the hazards of chemicals present in their work area. This training will be given at the time of initial assignment and prior to new assignments involving different exposure situations. Refresher training will be given _____ (insert how often).
- b. The training/information session shall include:
- i. The contents of 29 CFR 1910.1450 and its appendices. These shall be available to employees at _____ (insert location).
 - ii. The availability and location of the written chemical hygiene plan.
 - iii. Information on OSHA permissible exposure limits (PELs) where they exist, and other recommended exposure limits.
 - iv. Signs and symptoms associated with exposure to hazardous chemical in laboratories.
 - v. Location of reference materials, including all MSDSs received, on the safe handling of chemicals in laboratories.
 - vi. Methods to detect the presence or release of chemicals (i.e. monitoring, odor thresholds, etc.).
 - vii. The physical and health hazards of chemicals in laboratory work areas.
 - viii. Measures to protect employees from these hazards, including:
 1. Standard operating procedures;
 2. Work practices;
 3. Emergency procedures;
 4. Personal protective equipment; and
 5. Details of the chemical hygiene plan.
- c. _____ (insert name of position) is responsible for conducting the training sessions which will consist of _____ (insert training methods, eg. Videotape, slide tape, lecture, etc.). An outline of the training program is in Appendix _____. (An outline is included in this packet, which can be modified for your use).
- d. Each employee will sign a form documenting that they have received training. (Sample for included in this packet. *Note that a signed form does not necessarily mean that person has understood and retained the training provided. An enforcement officer would determine training based on employee interviews, and employee knowledge.*)
- e. _____ (insert name of position) is responsible for developing standard operating procedures. _____ (insert name of position) is responsible for the portion of the training on standard operating procedures.

VI. PRIOR APPROVAL FOR SPECIFIC LABORATORY OPERATIONS

Certain laboratory procedures which present a serious chemical hazard require prior approval by _____ (insert name of position) before work can begin. For this facility, these procedures include:

- a. Work with select carcinogens;
- b. Work with reproductive hazards;

- c. Work with neurotoxins; and
- d. Work with acutely hazardous chemicals (Consider the 8 physical hazards as well as the health hazards in this determination).

These chemical include:

_____ (insert a list of the acutely hazardous chemicals, for example cyanide).

(If the laboratory does not utilize these classes of chemicals then include a sentence which states “Our laboratory does not at this time use any chemicals which are sufficiently hazardous to require prior approval before they are used.”)

VII. MEDICAL CONSULTATION AND EXAMINATION

_____ (insert company name) shall provide, to affected employees, medical attention including follow-up examinations which _____ (insert clinic or physician name) determines is necessary under the following circumstances:

- a. Whenever an employee develops signs and symptoms associated with a hazardous chemical to which they may be exposed, the employee shall be provided an opportunity to receive appropriate medical examination. The employee shall contact the Chemical Hygiene Officer to initiate the medical program; and/or
- b. Where exposure monitoring reveals an exposure level routinely above the OSHA action level (AL) (or in the absence of an action level), exposure above the OSHA permissible exposure level (PEL) for OSHA regulated substances for which there are medical monitoring and medical surveillance requirements, medical surveillance shall be established for that employee.

Currently our laboratory uses:

- i. _____ (e.g. Benzene)
- ii. _____ (e.g.. Formaldehyde)
- iii. _____ (list other substances covered)

All of which have a separate OSHA standard with medical surveillance requirements.

(If none of these substances are used, indicate that no substances for which OSHA has medical monitoring requirements are being used).

- c. 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, laboratory or custodial, shall be provided an opportunity for a medical consultation. This consultation is for the purpose of determining the need for a medical examination.

- d. All medical examinations and consultations are provided for by _____ (insert physician's name) or at _____ (insert clinic/hospital name). All aspects of these examinations are provided by a licensed physician, or supervised by a licensed physician. These examinations are provided without cost to the employee, without loss of pay, and at a reasonable time and place.
- e. The _____ (insert name of position, e.g. Chemical Hygiene Officer) will provide the following information to the physician:
- i. Identity of the hazardous chemical to which the employee may have been exposed;
 - ii. A description of the conditions of the exposure including exposure date if available; and
 - iii. A description of signs and symptoms of the exposure that the employee is experiencing (if any).
- f. The written opinion that the company receives from the physician shall include:
- i. Recommendations for future medical follow-up;
 - ii. Results of examination and associated tests;
 - iii. Any medical condition revealed which may place the employee at increased risk as the result of a chemical exposure; and
 - iv. A statement that the employee has been informed by the physician of the results of the examination/consultation and told of any medical conditions that may require additional examination or treatment.
- g. The material returned to _____ (insert company name) by the physician shall not include specific findings and diagnosis which are unrelated to occupational exposure.

VIII. RESPONSIBILITIES UNDER THE CHEMICAL HYGIENE PLAN

_____ (insert name of position or individual) is designated as the chemical hygiene officer (CHO) for _____ (insert company name). *The qualifications for this individual are important. This person should have a background in both chemistry and safety).*

A chemical hygiene committee shall be formed. The membership list and minutes of the meetings are filed in/at _____ (insert location) for employee review.

(You may wish, at this point, to follow the categories in Appendix A of the Lab Standard 1910.1450 and assign some chemical hygiene duties to all staff. The categories used in this appendix are:

Chief Executive Officer;
Department Supervisor;
Chemical Hygiene Officer;
Laboratory Supervisor;
Project Director; and
Laboratory Worker.

(You may wish to designate your existing safety committee or a sub group of that committee as your chemical hygiene committee.)

IX. ADDITIONAL PROTECTION FOR WORK WITH SELECT CARCINOGENS, REPRODUCTIVE TOXINS, AND CHEMICALS WITH HIGH ACUTE TOXICITY

When any of these chemicals are used, the following provision shall be employed where appropriate:

- i. Establishment of a designated area;
- ii. Use of containment devices such as fume hoods or glove boxes;
- iii. Procedures for safe removal of contaminated waste;
- iv. Decontamination procedures.

(Appendix A of the standard has detailed programs for working with these chemicals. If you are using them, refer to Appendix A as a guide for your detailed procedures.)

[Note that according to the standard, a SELECT CARCINOGEN means any substance which meets one of the following criteria: (i) it is regulated by OSHA as a carcinogen; or (ii) it is listed under the category, "known to be carcinogens", in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (latest edition); or (iii) it is listed under Group 1 ("carcinogenic to humans") by the International Agency for Research on Cancer Monographs (IARC)(latest editions); or (iv) it is listed in either Group 2A or 2B by IARC or under the category, "reasonably anticipated to be carcinogens" by NTP, ...]

Appendix ____ to this plan includes the special procedures used in this laboratory for the use of these chemicals.

X. EMERGENCY RESPONSE

[There are two additional OSHA standards which interface with the Chemical Hygiene Plan; 1910.38 Employee Emergency Plans and Fire Prevention Plans, and 1910.120(p) and (q) Hazardous Waste Operations and Emergency Response (developed in response to SARA Title III). Please review these two standards and develop appropriate emergency procedures for your facility if your facility is covered by one of these standards.]

Appendix ___ is our company's emergency action plan under 1910.38.

Appendix ___ is our company's emergency response plan under 1910.120.

LABORATORY STANDARD TRAINING

- I. Occupational exposure to hazardous chemicals in laboratories standard (29 CFR 1910.1450):
 - A. Content of the standard and appendices;
 - B. Location and explanation of the chemical hygiene plan;
 - C. Location of reference materials and material safety data sheets (MSDS); and
 - D. Details of access to medical consultation and management system.

- II. Physical Hazards:
 - A. Combustible liquids;
 - B. Compressed gas;
 - C. Explosive;
 - D. Flammable;
 - E. Organic peroxide;
 - F. Pyrophoric;
 - G. Unstable (reactive); and
 - H. Water reactive.

- III. Health Hazards:
 - A. Local
 - a. Irritants, and
 - b. Corrosives.

 - B. Systemic:
 1. Toxics:
 - a. Acute/Chronic;
 - b. Nervous System Effects;
 - c. Respiratory System Effects; and
 - d. Reproductive System Effects.
 2. Sensitizers; and
 3. Carcinogens.

- IV. Route of Exposure:
 - A. Inhalation;
 - B. Skin Absorption; and
 - C. Ingestion.

- V. Amount of Absorption:
 - A. Gases/Vapors;
 - B. Particulates:
 1. Dust
 2. Mist
 3. Fume

- VI. Dose:
 - A. Work Practices;

- B. Personal Hygiene;
 - C. Weight;
 - D. Personal Protective Equipment; and
 - E. Environmental Controls.
- VII. Duration of Exposure
- VIII. Exposure Limits Including PELs:
- A. Definition;
 - B. Established by:
 - 1. Chemical Similarity;
 - 2. Animal Studies; and
 - 3. Human Studies.
- IX. Air Sampling
- A. Required by OSHA;
 - B. Employee Reports of Illness;
 - C. Confined Space Work; and
 - D. Other.
- X. Response:
- A. Age;
 - B. Gender;
 - C. Body Size;
 - D. Health Status;
 - E. Personal Habits; and
 - F. Other Exposures.
- XI. Employee Concerns:
- A. Symptoms Limited/Many Causes;
 - B. Documentation;
 - C. Referral; and
 - D. Refusal to Work.
- XII. Company Specific Standard Operating Procedures

Laboratory Rules Summary
1910.1450

All laboratories where there is the potential for employee exposure to a hazardous chemical are covered.

Exposure monitoring must be conducted to assure compliance with OSHA Permissible Exposure Limits (PELs).

The employer must notify the employee to air sampling results within 15 days of receipt of results.

A written Chemical Hygiene Plan must be developed and implemented and shall include:

Methods used to keep exposure below the PELs;
Standard Operating Procedures (SOPs) for health and safety;
Control measures and protective equipment;
Fume hood inspection and maintenance;
Medical consultation and exams;
Designating a Chemical Hygiene Officer and/or committee;
Employee notification and training; and
Additional employee protection measures.

Employee Information and Training – Information and training must be provided to employees ensuring them of:

Hazards present in their work area;
The contents of the standard;
The Chemical Hygiene Plan;
PELs for materials in the lab;
Reference materials on chemical safety;
MSDS location and availability;
Protective measures; and
Signs and symptoms of chemical exposure.

Medical Surveillance – Medical consultation and exams must be provided:

Whenever an employee displays signs and/or symptoms of chemical exposure;
When exposure monitoring exceeds an action level or PEL that requires medical surveillance; and
Following a spill or leak or other emergency.

Hazard Identification – With respect to labels and MSDSs:

Incoming labels must not be removed or defaced;
MSDSs received with incoming shipments must be maintained and accessible;
Employer must determine if a material produced in the laboratory is hazardous; and
Material produced in the lab and shipped must meet the Hazard Communication Standard for MSDS and labeling.

Respirators – When respirator protection is required, the OSHA respirator standard (29 CFR 1910.134) must be followed.

Recordkeeping – All exposure monitoring and medical surveillance data must be maintained in accordance with the OSHA standard for recordkeeping (29 CFR 1910.1020).

TRAINING DOCUMENTATION

TOPIC: _____
(Attach outline of material covered)

DATE: _____

NAME _____

DEPARTMENT _____