OVERVIEW: OSHA LABORATORY STANDARD

Read and familiarize yourself with the Lab Standard at

<http://www.osha.gov/pls/oshaweb/owadisp.show\_document?p\_table=STANDARDS&p\_id=10106>

CHM 605 revised 9/24/2012

Introduction

In 1990, the Occupational Safety and Health Administration (OSHA) issued a regulation entitled [*Occupational Exposure to Hazardous Chemicals in Laboratories*](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10106), otherwise known as the Laboratory Standard (Lab Standard), to address and standardize the legal requirements for training, information, and other safety program elements in laboratory workplaces.

The goal of the Lab Standard is to ensure that laboratory workers are informed about the hazards of chemicals in their workplace and are protected from chemical exposures exceeding allowable levels (e.g., exceeding [OSHA Permissible Exposure Limits](http://www.osha.gov/SLTC/pel/index.html)). This goal is achieved by establishing and using written safe work practices in the laboratories through the implementation of a Chemical Hygiene Plan (CHP) and the training and record-keeping which it is required to require. (Yes, the Lab Standard requires the creation of a CHP in a laboratory workplace, and it requires that the CHP contain certain elements and requirement.)

Description -- Lab Standard consists of

(a) Scope and application. (276 words) Who, where, what work… is subject to this rule.

(b) Definitions. (1000) Includes Laboratory use of hazardous chemicals

*….means handling or use of such chemicals in which all of the following conditions are met:*

*(i) Chemical manipulations are carried out on a "laboratory scale;"*

*(ii) Multiple chemical procedures or chemicals are used;*

*(iii) The procedures involved are not part of a production process, nor in any way simulate a production process; and*

*(iv) "Protective laboratory practices and equipment" are available and in common use to minimize the potential for employee exposure to hazardous chemicals.*

(c) Permissible Exposure Limits. (36) *“For laboratory uses of OSHA regulated substances, the employer shall assure that laboratory employees' exposures to such substances do not exceed the permissible exposure limits specified in 29 CFR part 1910, subpart Z.”* The PELs of about 500 chemicals are set by OSHA. The PEL is (supposedly) the concentration in inhaled air that the average, healthy worker may be exposed to daily for a lifetime of work without significant adverse health effects. PELs are usually expressed as an eight hour time weighted average concentration (TWA or 8h-TWA.). The “action level” for chemical having a PEL is quite often half the PEL.

(d) Employee Exposure Determination. (149) Requirements for assessing and monitoring exposures. Laboratory workers must be protected from exposure to chemicals/mixtures above PELs. In general exposures are kept far below the PELs simply by working in a hood and keeping all work at least 4” back from the face of the hood. Initial exposure monitoring is to be conducted, through air sampling, if there is reason to believe that exposures to a chemical/mixture having a monitoring requirement (see 1910.1001 – 1052) routinely exceed the action level, and if it is found to be so, then periodic monitoring must be conducted as described by the monitoring requirement for that chemical/mixture.

These chemicals/mixtures have individual OSHA rule sections and requirements for monitoring:

Asbestos

Coal tar pitch volatiles

4-Nitrobiphenyl

alpha-Naphthylamine

methyl chloromethyl ether

3,3'-Dichlorobenzidine (and its salts)

bis-Chloromethyl ether

beta-Naphthylamine

Benzidine

4-Aminodiphenyl

Ethyleneimine

beta-Propiolactone

2-Acetylaminofluorene

4-Dimethylaminoazo-benzene

N-Nitrosodimethylamine

Vinyl chloride

Inorganic arsenic

Lead

Chromium (VI)

Cadmium

Benzene

Coke oven emissions

Bloodborne pathogens

Cotton dust

1,2-dibromo-3-chloropropane

Acrylonitrile

Ethylene oxide

Formaldehyde

Methylenedianiline

1,3-Butadiene

Methylene Chloride

(e )Chemical Hygiene Plan. (401) Incredible number of requirements in 401 words. According to the Lab Standard, the CHP **must**

- be capable of protecting employees and keeping exposures below PELs.

- be readily available

- include each of the following elements, indicate specific measures to be taken to ensure laboratory employee protection:

Written SOPs.

Criteria for determining and implementing controls to reduce exposures. Engineering controls, administrative controls, PPE…

Requirement that protective equipment, including hoods, function correctly and are used properly.

Detailed provisions for training and information relevant to the workplace chemical hazards. (More detail at (f) below.)

Description of when supervisor “prior approval” is required for any procedure.

Provisions for medical consultation and exams. (More detail at (g) below.)

Purdue REM (Radiological and Environmental Management, the waste-n-safety compliance people) provides a model Chemical Hygiene Plan, a template which consists of most of what has to go into a CHP. The supervisor of every work area (this is the professor when the work is funded research) is responsible for ensuring that the work area specific CHP is truly work area specific and adequate to meet all the OSHA requirements.

Each laboratory work area must contain a copy of the written work-area-specific CHP for that area, customized for that work area in such a manner that it complies with the Lab Standard requirements.

(f) I[nformation and training](#Information_and_Training). (283) This section of the Lab Standard gives explicit descriptions of what must be included in the training and information provided, and when. CHM 605 will include a generic information and training about many of the hazards that many of you will encounter. The rest is up to your supervisor and what he/she provides and arrangements. You can, and should, make it your responsibility as well.

(g) [Medical consultations and exams](#Medical_Consultations_and_Examinations). (393) You are entitled to medical consultation and/or care in the event of exposure, or signs/symptoms of exposure, or **even reasonable suspicion of exposure.** At no cost, no loss of pay. From a licensed physician. And follow-ups.

(h) H[azard identification](#Hazard_Identification). (184) Requirements for labeling, safety data sheets, and hazards awareness training. Labels must be maintained, and (M)SDSs must be kept if received with incoming chemicals, must be created and sent with any chemicals sent off site.

(i) Use of respirators. (46) “*Where the use of respirators is necessary to maintain exposure below permissible exposure limits, the employer shall provide, at no cost to the employee, the proper respiratory equipment. Respirators shall be selected and used in accordance with the requirements of 29 CFR 1910.134.”*

There are a lot of requirements in 1910.134. You may **NOT** simply buy a respirator at the hardware store and bring it to the lab.

(j) Recordkeeping. (54) Vast and quite demanding for 54 words.

The Lab Standard makes requirements in the paragraphs (c) – (j). They do \*not\* include any mention of first aid kits, emergency evacuation plans, disciplinary procedures, or chemical inventories, although these are all sound ideas and are implemented in some CHPs.