Spotlight on Lab Safety

Lab safety appears to be a topic that raises questions, as well as eyebrows. Since exposure to hazardous chemicals in a laboratory is a strong possibility and the potential for overexposure or injury exists, it is essential that your laboratory safety process be well organized and executed.

The Occupational Safety and Health Administration has a standard which covers laboratory safety. This standard is known as, "Occupational Exposure to Chemicals in Laboratories," 29 CFR 1910.1450.

The keys to compliance with this OSHA Lab Safety standard are:

1. Development and implementation of a Chemical Hygiene Plan (CHP).
2. Development and maintenance of a Chemical Inventory List.
3. Maintain Material Safety Data Sheets/Safety Data Sheet for each chemical in the laboratory.
4. Written Standard Operating Procedures (SOPs) for the laboratory.
5. Written Training Program for laboratory employees.
6. Medical Consultation.
7. Labeling.

The Chemical Hygiene Plan (CHP)

The Chemical Hygiene Plan should include standard operating procedures (SOPs) to ensure the safety of lab workers. The SOPs should contain detailed protocols and procedures for conducting experiments. Additionally, there should be a chemical Hygiene Officer (CHO) assigned who is responsible for implementing and enforcing the CHP. Criteria need to be developed for determining control measures to reduce exposure to hazardous chemicals including engineering controls, personal protective equipment and hygiene practices. The CHP should include a provision to ensure that fume hoods and other protective equipment are functioning properly and that specific measures are in place to ensure proper and adequate performance of this equipment. Last but not least, there should be written documentation for emergency evacuation and response, maintenance of materials safety data sheets (MSDS)/safety data sheets (SDS), and laboratory standard operating procedures.

Chemical Inventory List

A chemical inventory list should be developed as a check and balance system. It should be used to verify current inventory and also serves as a tool to verify that all the necessary MSDSs/SDSs are on file.

Material Safety Data Sheets (MSDS)

A master library of MSDSs/SDSs should be maintained for each regulated chemical in the lab. The master library should be in a location that can be readily accessed during any period of occupancy in the lab. It is equally as important that personnel know the location of the master library and how to read an MSDS/SDS.

Written Standard Operating Procedures

The CHO will be responsible for training staff on all the SOPs which pertain to the chemicals and procedures used in the laboratory. Work with particularly hazardous or unique chemicals requires special provisions for additional SOPs. In this case, the CHO must write SOPs that describe the work to be conducted and the safety measures to be taken by the employee. Procedures and written safety precautions included in the laboratory notebooks may serve as laboratory-specific SOPs. Keep these individual SOPs in the laboratory and train employees on their contents.

Written Training Program and Documentation of Training

A written training program should be developed, and as a minimum, including the following:

- Review of the hazards of the chemicals associated with the laboratory and methods that may be used to detect the presence or release of a hazardous chemical (such as monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);
- The physical and health hazards of chemicals in the work area and the measures employees can take to protect themselves from these hazards. These measures should specify procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used.

Employees should be trained on the applicable details of the employer's written chemical Hygiene Plan, know where the plan is kept and have access to it. They should also know the location of and have access to the Material Safety Data Sheets/Safety Data Sheets for the chemicals that they use or may come in contact with.

Medical Consultation

The employer should provide all employees who work with hazardous chemicals an opportunity to receive medical attention, including any follow-up examinations which the examining physician determines to be necessary, under the following circumstances:

1. Whenever an employee develops signs or symptoms of overexposure;
2. Where exposure monitoring reveals an exposure level routinely above the action level;
3. Whenever an event such as a spill, leak or similar release occurs which would result in the likelihood of a hazardous exposure.

All medical exams should be done by licensed physicians and at no cost to the employee. The employer must provide all pertinent chemical information to the physician.

Labeling

Employers should ensure that the labels on incoming containers are not removed or defaced. If chemicals are transferred to another container, the new container should be labeled accordingly unless the chemical is to be used by only one person, be in that person's completely control and only be a one-shift supply.