

TerranearPMC Safety Share

Week of June 2, 2014 – OSHA's Chemical Hygiene Plan

When the Occupational Safety and Health (OSH) Act was passed by Congress and then signed by President Nixon in 1970, the law of the land was established which required employers to have all recognized hazards within their work environment properly controlled.

Initially, analytical laboratories, with all the hazardous chemicals handled on a daily basis, were not addressed through the OSH Act, as the newly established government agency, OSHA, believed that persons who worked in a laboratory setting held degrees of higher learning, including masters and doctorates. Therefore, such people had to be quite knowledgeable of their workplace hazards, so establishing safety and health protocol for such learned people would not be necessary. After all, these people were the ultimate subject-matter experts when it came to the dangers of chemicals. So what regulations would be necessary to make these professionals even more knowledgeable when it came to chemical safety?

It took about two decades for OSHA to recognize how wrong they were, as data for serious injuries and even fatalities in laboratory settings began mounting. It turns out that human beings, regardless of the amount of education we have, are quite susceptible to workplace hazards, and our level of schooling is no guarantee of our safety in the presence of workplace exposures.

So in 1990, OSHA established the Chemical Hygiene Plan and is now presented as the regulation, 29 CFR 1910.1450. It requires facilities engaged in the use of chemicals in a laboratory to develop and implement a written chemical hygiene plan (CHP). OSHA requires these facilities to develop procedures, while having proper equipment and PPE for all affected workers, including establishing appropriate work practices, training, and policies to help protect employees from the health hazards presented by hazardous chemicals used in their work environment.

The CHP has eight mandatory elements, which are:

1. Describe standard operating procedures.
2. Define criteria for implementation of control measures, which means deciding how the employer is going to protect employees. There is a general priority of protecting employees. The three-tier system: engineering controls, administrative controls, and PPE.
3. Define (and document) procedures to maintain proper functioning of chemical fume hoods and protective equipment. This includes procedures such as checking the flow rate of hoods and verifying that equipment is working properly.
4. Provide employee information and training.
5. Provide criteria for prior approval. Where you have processes or procedures where employees have to get prior approval (e.g., working alone) criteria allow employers to make arrangements for protection.
6. Provide criteria for medical consultation and examination.
7. Designate persons responsible for implementation of the CHP. Employers must designate responsibilities to a variety of people both in and out of lab, including the chemical hygiene officer (CHO) and others. The highest up person should sign the plan, saying that he/she has authorized the plan.
8. Provide employee protection from particularly hazardous substances. Inventory chemicals and decide what in this category—for example, carcinogens and extremely reactive materials.



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The written CHP must be easily accessible (similar to Safety Data Sheets in the Hazard Communication Standard). It needs to be designed to protect employees from health exposures associated with hazardous chemicals in their specific laboratories. The plan can be maintained and available electronically as long as employees know how to access it.

As one would expect, 29 CFR 1910.1450 requires every employer that has the responsibility to operate and maintain a laboratory must comply with some very specific tasks. These include:

- Develop and implement a written CHP
- Inventory all hazardous chemicals and ensure each has a safety data sheet (SDS)
- Ensure that labels on incoming containers of hazardous chemicals are not removed or defaced
- Maintain any SDSs that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible to laboratory employees
- Train employees on physical and health hazards and protective measures
- Provide medical monitoring for employees (under certain circumstances)

The CHP also establishes specific responsibilities for persons that work in a laboratory as well. They are:

- Follow all procedures and policies relating to chemicals and follow appropriate laboratory procedures and rules as outlined in the CHP
- Refrain from operations without proper instruction and/or authorization
- Seek out and request information
- Wear appropriate PPE
- Report accidents and near-misses immediately, even minor injuries or exposures

The CHP establishes a new position, referred to as the Chemical Hygiene Officer or CHO, and is tasked with the overall responsibility for maintaining and establishing compliance with the CHP while providing technical guidance. Additional responsibilities of the CHO include:

- Updates the CHP, chemical and SDS inventories
- Provide training to all laboratory personnel
- Ensures that laboratory employees follow SOPs
- Ensures that safety equipment and engineering controls are utilized
- Ensures that personal protective equipment is utilized
- Conducts and documents inspections
- Assists in development of procedures for new or particularly hazardous operations
- Accident investigation and corrective action
- Maintains records

It is interesting to note that at first, OSHA did not see a need to protect workers in a laboratory setting, and then after looking at the evidence, there was a change in their understanding. As the theory of *human performance improvement* acknowledges and expounds, we are human and as such, we will make mistakes; no matter how educated or smart we are. If there is anything we, as humans need to understand, whether we operate a forklift or experiment with new chemical compounds, we are susceptible to workplace hazards and if we do not work within the guidelines and regulations that have been proven to protect us, surely we, as well as our families and friends will experience the consequences; some of which may be unforgiving.

A cynical young person is almost the saddest sight to see, because it means that he or she has gone from knowing nothing to believing nothing. Maya Angelou (4/4/1928-5/28/2014)