

**Environmental Health and Safety**

**At**

**The University of California**

**An Update**

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# **Environmental Health and Safety at the University of California**

## **Introduction**

### UC Campus and National Laboratory EHS Departments & Programs

The Environmental Health and Safety (EHS) programs at the University of California (UC) campuses, hospitals, DANR and national laboratories are a major effort, which includes over two thousand employees working in numerous disciplines. The largest EHS department located at the Los Alamos National Laboratory has in excess of one thousand personnel while the smallest department at UC Santa Cruz has only nine employees. Their programs and areas of responsibility vary by location. UC San Diego is the only totally centralized department with all EHS and Risk Management (RM) functions under one director. All the departments share most of the core elements and programs. The EHS function is unique because it interfaces on a daily basis with the entire campus community; faculty, staff, students, visitors and the surrounding communities. The mission of the EHS departments is to provide a safe, healthy and environmentally responsible place for people to work, learn, visit, and live. The EHS departments are the primary contact for local, state and federal agencies to inform the campus communities of regulatory requirements and to perform compliance functions related to EHS. Requests for EHS information, training, regulatory interpretation and applicability, approval of potentially hazardous procedures, resolution of safety problems, surveillance and monitoring are all functions handled by the EHS departments. EHS serves as the campus workplace safety consulting resource. They are working partners in campus advisory groups such as the Chemical Safety Committee, the Radiation Safety Committee, the Animal Use and Care Committee, the Biological Safety Committee, and numerous other administrative and research committees. The EHS departments must also interface with all campus departments to ensure their activities are successful. It is never an EHS decision to say yes or no to an activity, but it is always their responsibility to provide recommendations on how to safely accomplish any mission their campus or lab desires to undertake.

## **Core EHS Programs**

### Hazardous Material Management (Haz-Mat)

During the course of daily operations, UC facilities use many materials, some of which are considered or are classified as hazardous. Such materials include chemical reagents, solvents, fuels, paints, cleaners and other chemical products that are used in laboratory research, maintenance, and teaching. Additionally radioactive isotopes and biohazard materials are also used in laboratory research. The nuclear, biological, and chemical (NBC) safety programs address the use of these materials from the time they are delivered on campus until they are reduced to hazardous waste and transported off campus to a disposal site. Other areas included in this program are, medical waste, sharps

control, transgenic materials, non-ionizing radiation, lasers, underground storage of Haz-Mat, pesticides, fungicides and anything else that remotely deals with the acquisition, use, storage, transportation and disposal of Haz-Mat on campus. Each campus is also required to develop plans to handle Haz-Mat; these include a Haz-Mat Business and Management Plan, a Chemical Hygiene Plan, a Spill Prevention Plan and numerous other contingency plans.

Regulations for Haz-Mat have developed over time. It is regulated by numerous agencies whose jurisdiction and responsibility overlap. Federal agencies that regulate Haz-Mat are the Environmental Protection Agency (EPA), and the Occupational Safety and Health Administration (Fed/OSHA). At the state level, the California Occupational Safety and Health Administration (Cal/OSHA) and the Office of Emergency Services (OES) are the primary agencies. County and other local agencies also may have more specific regulations. The transportation of Haz-Mat is regulated by the Department of Transportation (DOT) at the federal level and the Department of Toxic Substance Control (DTSC) at the state level. They may also delegate this authority to county and local agencies. The Nuclear Regulatory Commission (NRC) regulates radioactive material at the federal level and the Radiological Health Branch of the Department of Health Services (DHS) at the state level. The Center for Disease Control (CDC) and the US Department of Agriculture (USDA) regulate biohazards and select agents.

### Employee & Worker Safety

This “work safe” program includes specific targeted areas aimed to reduce and eliminate hazards present in the work place. These deal primarily with maintenance, custodial and skilled trade employees. However, all employees to include part time student employees and contractors are covered under this umbrella. At the federal level Fed/OSHA is the regulating agency. The national labs as part of the federal Department of Energy (DOE) are subject to these federal standards. The campuses are regulated by Cal/OSHA as they are state agencies. Included in this program are:

- Lead and Asbestos Safety
- Employee Right to Know
- Hazardous Communication
- Injury and Illness Prevention Plans (IIPP)
- Blood Borne Pathogens (BBP)
- Machine Guarding
- Electrical Safety
- Hand & Machine Tool Safety
- Respiratory Protection
- Lockout & Tagout (LOTO)
- Confined Space

This list is only a sampling of the numerous Cal/OSHA required programs that encompass Employee Safety. Each program individually is a small piece of the big picture. When combined these programs create the safe, healthy and risk free environment that every worker deserves and takes for granted.

## Fire Safety, Prevention and Protection

Contained within most EHS departments are the campus fire marshals. Their function is to ensure that adequate fire protection and prevention plans are in place for each campus. They perform fire and building code plan reviews of all new construction and major remodeling projects. They conduct periodic fire code and usage inspections of all facilities, including housing units. In conjunction with the campus or local fire departments they conduct fire prevention training for all campus users from children in day care facilities to contractors operating on campus.

## Accident Reporting, Investigation and Notification Procedures

“An accident” is an unplanned event that results in injury, damage to property or environmental exposures. The EHS departments document these occurrences, track their findings and apply corrective actions to prevent future similar mishaps. When an accident does occur the EHS departments investigate to determine the root causes. This information is used for prevention and is also shared with the Risk Management department. The information is then used in the claims and the case management aspects of risk management. It is also used in programs to reduce worker’s compensation cost and rapidly return employees to work. The EHS department staff performs major investigations. Minor accidents are investigated by the supervisors, who have been trained by the EHS departments to perform these functions. Cal/OSHA logs are maintained to record these mishaps; annually these logs are totaled, displayed for all employees to see. Immediate notification to Cal/OSHA is required for selected serious accidents.

## Hazard Recognition and Control

The hazard recognition program involves the identification of hazards through employee reporting and EHS department surveys, audits and visits to the facilities. The campuses and labs all use some type of reporting system whereby individuals can report any hazard or potential problem without the risk of retaliation. These reports can be anonymous but are easier to follow up if a person can be contacted. They may be submitted by mail, telephone or sent electronically in most cases. The EHS departments have internal time lines to respond to and correct the hazards, most work on a seven day initial response and a thirty day follow up for corrective actions to be completed.

## Ergonomics

“Ergonomics” is a Greek word that means the laws of work. This discipline was once known as Human Factors Engineering, it started in the Aerospace Industry during the late 1940s. In general terms its function is to design or fit a person’s workplace to that person and not to force a person to try to fit into an existing workplace. Although there is no federal standard, Fed/OSHA utilizes the general duty clause to enforce these ideas. California is the only state that has a state standard on Workplace Ergonomics. This standard deals primarily with office and computer ergonomics but is applicable to all work sites. This is a significant effort for the EHS departments. The California standard requires specific actions if Repetitive Motion Injuries (RMIs) occur. The risk factors which cause these types of injuries are well known, this gives EHS staff the rare opportunity to recognize potential injury factors and correct them before the injury or accident occurs. Thus the major effort for this program is on prevention.

## Employee Safety Training

The safety-training program overlaps most of the other programs but constitutes another major effort for the EHS departments. The goal is to provide quality training and to ensure employees receive the appropriate training. Employee safety training includes many general and specific topics, most are required by a regulatory agency but some are utilized to cover a specific assignment or task. Examples of these are:

- New employee safety orientation
- Lab safety training
- Asbestos & Lead certification training
- Defensive driving class
- Hazardous communications training
- Disaster preparedness training
- Respiratory training and fitting
- Water and diving safety training

## Personal Protective Equipment (PPE) Program

The requirements for a PPE program are contained in both Fed/OSHA and Cal/OSHA regulations. In general they state that an employer must provide, at no cost to the employee, protective clothing and equipment to ensure employees are not exposed to any known hazard. The program applies to employees who work with or could potentially be exposed to any hazardous conditions. This could be a lab worker using chemicals who is provided aprons and glasses, a maintenance worker who operates power tools and is provided with eye and ear protection or a Haz-Mat responder who is provided with and trained to use full “Level A” protective suits and self-contained breathing apparatus. The program is time consuming and costly. In some cases the EHS department pays for the equipment, but in most cases the using department pays for and provides the items, which are recommended by EHS.

## Emergency Management

Every campus and lab has an emergency management organization; some are a one-person operation while others are more extensive. Most of these people work in the EHS department but some are in the Police or Fire departments. The planning is a cooperative effort with many departments including many off campus emergency organizations, through mutual aid agreements. In addition, with the community “right to know” laws, all concerned or interested community groups must be involved in planning and preparedness. Preparedness involves training and practice drills, both actual hands on and table top exercises. The EHS departments participate extensively in these activities and if or when an actual emergency occurs they will respond. The trained experts in nuclear, biological and chemical (NBC) response are all part of the EHS departments and part of the emergency response teams on their campuses.

## Athletic, Recreational and Field Safety

Off site safety is a relatively new area in which the EHS departments are becoming involved. OSHA law applies to all work sites even if an employee is in Japan collecting samples inside of a volcano; employees are still protected by OSHA and Worker’s Compensation laws. The employer must provide the same level of protection as when they are working on campus. EHS also looks at the area of employee athletics and recreation. Most campuses have some type of recreation center or gym that allows employees to utilize the facilities. The university is responsible for their safety and health at these facilities even if they are not in a paid status. Also if a department has an off campus activity and the employees are in a paid status the university is responsible. The EHS departments are now looking at these activities. A special field safety workgroup has been appointed and is expected to produce a final work product in 2005.

## Environmental & Occupational Health Programs

Occupational health programs deal with employees who are in a position where they may become exposed to hazardous agents or situations that could produce a chronic or acute illness or disease. These employees are given a base line physical or performance test to establish their conditions at time of hire. The employee is then given periodic (normally annual) similar physicals or performance tests to document any changes and allow the employer to take immediate action. Examples of these programs are:

- Audiometric (hearing) test for workers in high noise areas
- Respirator physicals for workers who are required to wear breathing protection
- Lead & Asbestos worker physicals
- Haz-Mat worker and responder physicals
- Vision examinations for laser workers
- US Coast Guard Boat Captain physical and drug program
- Diver physicals

## Anti-Terrorism & Homeland Security

After “9-11” Anti-Terrorism programs has moved to the forefront of many organizations. The EHS directors took on this responsibility as the logical focal point to coordinate the campus wide efforts. The degree of involvement is varied from campus to campus. UCSF’s Chancellor appointed a group to conduct a through survey and detailed vulnerability assessment with follow-up action that included the hiring of a senior person to coordinate the effort. This person will work closely with the EHS director. Other campus efforts were somewhat less extensive, but all did some type of vulnerability assessment and implemented corrective measures. The EHS directors convened a system wide group to discuss these issues and share successes. This effort continues with periodic conference calls. UCOP has now taken over this effort and is coordinating this effort system wide. EHS is the logical place for this activity to be centered because the departments deal, on a daily basis, with items and activities that attract the terrorist to our campuses.

## Safety Advisor, Coordinator Program

Considering the span of control of the EHS departments it is impossible for their employees to be at every activity and observe everything that goes on. To add more eyes and ears to the departments, all have initiated some type of collateral duty safety officer program. EHS departments utilize additional employees assigned to another department, whose primary function is not safety and are not compensated by the EHS department. The EHS departments provide training and equipment for these people to perform their safety functions. They are usually a part of a safety committee or other safety group that meets on a regular basis. The EHS departments provide the organization and expertise to these groups. On at least two campuses this has developed into full time safety personnel outside of the EHS department who deal specifically with their own department’s EHS needs.

## Long Range, Master and Facilities Planning

The campus EHS departments must be involved in all aspects of campus planning. Most have a representative on the Master Planning Committees and are involved in other long and short-range campus planning efforts. This proactive approach has been shown to be most effective because it is much easier and more cost effective to design-in and plan for safety related items than it is to add them after the project is underway or completed.

## Industrial Hygiene Programs

Fed/OSHA and Cal/OSHA both require that all emergency or protective equipment be properly maintained and periodically inspected. The individual or Personal Protective Equipment (PPE) issued is inspected and maintained by the user. Fixed or installed emergency equipment is normally inspected by the EHS department and maintained by the facilities department. The most common type of fixed emergency equipment includes emergency eyewashes; emergency showers and laboratory fume hoods. The larger campuses and labs have over one thousand of these items in their programs. Other industrial hygiene programs include, but are not limited to, indoor air quality, laboratory ventilation, mold recognition, lead and asbestos testing.

## Petroleum Storage Systems

During the past ten years or so a major effort was undertaken to replace all old underground storage tanks (UST) and to determine if tanks; both aboveground petroleum storage tanks (AGPST) and UST were leaking or secure. Suspect tanks were removed and the surrounding areas properly remediated. This effort is 90% complete with tanks being replaced and piping systems being upgraded to prevent leaks or spills. The EHS departments continue to be involved in this with the required monitoring, leak testing and annual inspections.

## Facility Inspection Programs

The EHS departments conduct periodic surveys and inspections of campus facilities. The frequency of these inspections depends upon the hazards present in the facility. Haz-Mat storage facilities are inspected weekly, NBC labs are inspected monthly, and Day Care centers are inspected at least annually. The other buildings are visited on a reoccurring basis. These surveys are normally combined with other inspection such as fire prevention or facility department visits.

## Lab Animal Usage and Safety

The EHS departments are also involved in the care and safety of animals used for research on the campuses and labs. The EHS departments have representatives on the animal usage committees, they inspect facilities and they provide medical monitoring to potentially exposed employees.

## Pesticides, Fungicides, Insecticides Program

These toxin control programs again are regulatory directed. The California Pesticide Containment & Prevention Act is the primary legislation. EHS deals with all aspects of these products from acquiring them through proper usage and disposal. Specific training for workers and applicators is normally handled by the EHS departments, also monitoring of the storage facilities and the application phase is an EHS responsibility.

## Outside Audits, Inspections, Surveys

EHS department programs, policies and procedures are continually subject to inspection by outside regulatory agencies. The list of Federal, State and Local agencies is extensive; such as OSHA, EPA, USDA, CDC, NRC, ACE, DFG, DTSC, etc. Additionally the EHS departments conduct internal audits of their programs and on occasion other UC units will perform courtesy peer audits. Recently at the request of the UCD EHS department the UCSF EHS department performed a peer audit.

## Clean Air, Clean Water Act Compliance

A big part of the environmental area of EHS involves ensuring compliance with all clean air and clean water regulations. All devices with the potential of polluting either of these areas are monitored. Most stacks and chimneys have some type of monitoring devices to detect out-put pollutants and these are checked on a regular basis. All water and sewage flow off campus is also monitored. Permits are required for new or upgraded existing facilities to include storm water and rain runoff. The treatment of products that exceed standards is undertaken on most campuses. These programs are the primary responsibility of the EHS departments, with key cooperation from the facilities department and other users on campus. Spill prevention plans are included in this area. It is much easier and more cost effective to prevent the spill or release than it is to clean up afterwards.

## Risk Management

“Risk” is defined as the probability of an event occurring combined with the potential severity if the event occurs. These two areas are also known as loss prevention and loss control. Traditional Risk Management (RM) programs deal with the loss control side of this equation. The university purchases insurance to lessen the impact of a large dollar loss, contracts are written to keep claims against the university to a minimum, and injury cases are managed to help keep the dollars spent to a minimum. While the RM department deals with the loss control aspects, traditionally the EHS departments handle the loss prevention side trying to prevent accidents before they occur. When these two are separate units communications can be difficult, however this is becoming better at most campuses. UCSD plus some Cal State University sites have combined these two organizations under one director.

## Super Fund Sites

Super Fund sites are old hazardous material dumps or contaminated sites that have been reported to and recognized by the EPA. The CERCLA law of 1980 and SARA amendments of 1986 provided funding for the cleanup of these sites. Some of the campuses and lab have these sites. The EHS departments track the cleanup progress at these sites and monitor the sites. The state also has a similar organization DTSC to use additional state funding for some site cleanup. The funding for these sites is very slow in maturing. Since the initial legislation in 1980 over half the Superfund money spent has been used for litigation related activity and not for actual cleanup.

## Non Hazardous (Solid Waste) Program

The Federal Solid Waste Disposal Act and the State Integrated Waste Management Act govern the handling of non hazardous waste; this includes household garbage, paper, and anything else not classified as Haz-Mat. These products go to an on or off campus landfill. The EHS departments monitor the handling of this material for worker safety and to minimize the quantity of waste by utilizing recycling programs. When the landfills are on campus, EHS monitors the sites to help prevent improper dumping and to ensure the site is not polluting the surrounding areas.

## Driving and Vehicle Safety Program

The leading cause of occupational fatalities nationwide is motor vehicle accidents. All UC EHS departments have programs to address these risks; these include driver training and defensive driving classes, seat belt usage programs, vehicle inspection and maintenance programs, policies and procedures, plus other training to limit the potential exposure of employees and other users to these hazards.

## Integrated Safety and Environmental Management (ISEM)

ISEM is a new concept in the safety and environment arenas. It moves the responsibility for the EHS functions down to the individuals and the immediate supervisors. The EHS departments become more of an internal consultant and advise the individuals and supervisors on proper procedures and control measures. The program includes these five core functions:

- define the scope of work
- analyze the hazard
- develop and implement hazard controls
- perform the work within the controls
- provide feedback and continuous improvement

Also at the core of the program is the fundamental guiding principal that “Each worker, supervisor, and manager is directly responsible for ensuring his or her own safety and promoting a safe, healthful, and environmentally sound workplace.”

The national labs under DOE directive have developed and have been utilizing this type of a safety management system for the past two years. With their experience and help the concept is now being introduced into the UC campus programs. The first step will be to create a new HSE policy to replace the old EHS policy. This policy is in final draft, and has been submitted through the OP EHS Director to the appropriate Vice President and to the University of California President for his approval.

## Summary

### UC EHS Directors Committee

The EHS effort system wide is very unique and effective in how it operates. The directors from all ten campuses, the three national labs, and UCOP have formed the UC EHS Directors Committee which meets three times per year for two days to discuss key issues. Additionally they conduct monthly conference calls to keep updated between meetings. This group also appoints formal workgroups to research specific areas or topics and report back to the directors. The directors have published guidelines for these workgroups. Each workgroup has a director and a UCOP representative appointed as its liaison. There are twelve standing workgroups, they are as follows:

- |                        |              |
|------------------------|--------------|
| • Anti-Terrorism       | UCR Liaison  |
| • Bio-safety           | UCSF Liaison |
| • Emergency Management | DANR Liaison |
| • Environmental Health | UCLA Liaison |
| • Environment          | UCSB Liaison |
| • Ergonomics           | UCSD Liaison |
| • Field Safety         | UCI Liaison  |
| • Fire Marshals        | UCSC Liaison |
| • Hazardous Waste      | UCB Liaison  |
| • Industrial Hygiene   | UCD Liaison  |
| • Radiation Safety     | LBNL Liaison |
| • Safety Training      | LLNL Liaison |

Additionally ad hoc groups are appointed as needed to look at new or short-term issues. Each workgroup and the directors committee maintain a listserv to facilitate communications and exchange ideas.

## UCOP EHS Systems and Support

The EHS Director at UCOP provides a wide range of support to the campuses, labs and UCOP:

- Attends all the UC EHS Directors Committee meetings and conference calls.
- Attends the EHS Workgroup conference call and meeting for the groups related to their area of expertise.
- Provides legislative analysis and updates on Federal and State legislative issues.
- Acts as the subject matter expert to the campuses and labs in their areas of concern.
- Visits all sites once per year and review select campus programs to determine best practices.
- Represents the University at professional organizations in California and nationwide.
- Represents the University at regulatory agency meeting and reviews.
- Attempts to standardize the EHS programs through the system.
- Acts as liaison between the UCOP Vice President and the EHS directors.
- Serves as subject matter staff advisors to the President of the University.
- Provides an interface between regulatory agencies and the campuses.
- Provides technical expertise to the Office of General Council (OGC).

### Bottom Line

The University of California campus, hospital and laboratory Environmental Health and Safety Directors have a tremendously broad scoped job with unlimited responsibilities; the most important function of the UCOP EHS Director should be to make the campus EHS director's jobs a little easier.