Chemical Hygiene Plan Evaluation
Annual Report

Academic Year 2018-2019
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California State University, Sacramento
Environmental Health and Safety
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Executive Summary

The regulation pertaining to the laboratory use of hazardous chemicals requires an annual review of the effectiveness of the program. The Office of Environmental Health and Safety (EH&S) determines the effectiveness by using indicators including, but not limited to, employee training compliance, reports of spills and incidents and findings in annual inspections. In 2018, the California State Auditor completed an audit of campus safety and recommended that the annual evaluation be more formal and documented. This report will meet the recommendations of the 2018 audit as well as comply with the regulatory obligation. The methodology for assessing program effectiveness included a review of the indicators previously noted as well as a section by section review of the written program with recommendations for improvement.

Overall, the campus Chemical Hygiene Plan is effective in identifying how chemicals are used, stored and managed in laboratories.

Recommendations for improvement include the following:

Section 4, Purpose

- The document should be edited to revise the term "employees" to "Faculty, Staff, Students, Volunteers, and Visitors" when it pertains to the laboratory use of hazardous materials and chemicals.

Section 6, Responsibilities

- The document should be revised to include the Stop Work Authority (SWA) for all employees who feel that they are not properly trained on, or are using hazardous materials in such a way that poses an imminent threat to their health and safety, or the health and safety of those around them.

Section 7, Standard Operating Procedures

- The NSM Safety Manager and CHO are in the process of creating new SOPs for general and more specific processes that will improve understanding of hazards and appropriate methods of control. It is recommended that the Chemical Hygiene Plan include the general SOPs and, when developed, the college laboratory safety manual include SOPs for specific operations.

    - It is recommended that under protective clothing it be added that minimum safety attire to enter a chemical laboratory be closed toe-footwear and long pants/garment covering the legs with no visible skin showing between the garment and the footwear.
    - It is recommended that an addition be made addressing service animals and minors in laboratories. While service animals and minors are permitted, it is recommended that safety precautions be discussed between the university member in charge of the laboratory space and any guests entering their location.
    - Section 7.7 should include wording describing that chemicals are not to be left out of their locked storage area. I.e. Chemical cabinets, flammable storage cabinets, behind locked doors in the room designated for the storage of chemicals.

- Section 7.7 should include wording describing the use of secondary containment to store compatible chemicals.

Section 8, Control Measures and Equipment

- In each laboratory that is using hazardous chemicals, it is recommended that the University provides access to a hazardous materials spill kit.

Section 10, Particularly Hazardous Substances

- It is recommended that when laboratories use particularly hazardous substances, they should have Standard Operating Procedures constructed for the safe use of those substances.

Section 12, Approval Procedures

- Use of chemicals that are air or water reactive as well as asphyxiating or highly flammable gases should also require the development of an approved SOP. Other chemicals that present a high degree of acute toxicity, including hydrofluoric acid, should also be included. Assessments and SOPs developed for this section require annual review.

Section 13, Procurement and Gifts

- EH&S will work with Procurement Services to establish guidelines for procuring chemicals that are extremely hazardous, carcinogenic or reproductive toxins.

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I. Introduction and Scope

The Chemical Hygiene Plan (CHP) provides guidance to all campus faculty, staff, students and volunteers who work with hazardous chemicals in a laboratory setting in compliance with California Code of Regulations, Title 8 §5191, *Occupational Exposure to Hazardous Chemicals in Laboratories*. The "laboratory use" of hazardous chemicals is defined as activities where the work is "laboratory scale", e.g., work performed by one person using standard laboratory safety equipment, with multiple chemicals and procedures, not as part of a production operation. Chemical use in shops, art studios and facility operations is performed in accordance with the campus Hazard Communication program, Title 8 §5194, *Hazard Communication*, and not included in this review.

The campus CHP includes a requirement for the University Environmental Health and Safety Committee, now known as the Executive Safety Committee, to review the University's efforts to minimize hazardous waste. This information is provided in Part XI of this report.

This evaluation is the result of observations made by the Chemical Hygiene Officer (CHO) during routine visits and inspections of laboratory spaces, review of department and college safety committee meeting minutes as well as discussions with the Safety Manager for the College of Natural Science and Math. Recommendations are provided at the end of the evaluation of each section of the CHP.

II. Section 4, Purpose

This document has been designed to:

- Protect all employees involved in the laboratory use of hazardous chemicals from exposure to chemicals.
- Comply with California Occupational Health and Safety Administration, Title 8, Section 5191, Occupational Exposure to Hazardous Chemicals in Laboratories.

Recommendations: The document should be edited to revise the term "employees" to "Faculty, Staff, Students, Volunteers, and Visitors" when it pertains to the laboratory use of hazardous materials and chemicals.

III. Section 6, Responsibilities

The CHP identifies specific responsibilities as summarized in the table below.

Title	Responsibility
University President	• Ultimate responsibility for all risks: financial, business, reputational, legal and hazard
Executive Safety Committee	• Develop and recommend policy • Review efforts to minimize waste • Review the annual report of the Chemical Hygiene Officer • Review laboratory accident reports
Office of Environmental Health and Safety	• Provide support on hazard assessment and controls to prevent exposure • Provide training and maintain records • Complete inspections of all laboratory spaces and safety equipment
Chemical Hygiene Officer	• Advise all employees on matters of chemical hygiene • Investigate accidents and incidents • Maintain currency on regulatory matters • Facilitate the medical surveillance program • Provides safety training
Deans, Directors, and Department Chairs	• Identify all laboratories and employees who work with hazardous chemicals • Monitor training compliance in their unit
Laboratory Supervisor	• Ensure appropriate procedures and personal protective equipment are identified and employed to prevent exposure • Inspect labs at least once/semester • Maintain chemical inventory and assure SDSs are available
Laboratory Workers	• Understand and act in accordance with the CHP • Participate in training programs • Report all incidents to supervisor • Review SDSs to ensure an understanding of the hazards in the laboratory.

Section 6.1 The Executive Safety Committee met on three occasions in the Fall 2018 semester, and on three occasions in the Spring 2019 semester. The committee will review effectiveness of the CHP during the Fall 2019 semester.

Recommendations: None

Section 6.2 The Office of Environmental Health and Safety has continued to support the faculty and staff using chemicals. Hazardous waste is routinely removed from the laboratories and disposed in accordance with regulatory requirements. Employee training statistics have been provided to department chairs and instructor-led and computer based training were made available.

Recommendation: None

Section 6.3 Chemical Hygiene Officer provided support on issues related to chemical safety. The CHO participated in Chemistry department and NSM safety committees.

Recommendation: None

Section 6.4 Deans, Directors, and Department Chairs worked with EH&S to identify laboratories and responsible parties for each, reviewed training records and promoted safety in each department.

Recommendation: None

Section 6.5 Laboratory Supervisors supported the roll-out of the new inventory program purchased by campus. Many faculty also began using the assessment tool which assists in identifying hazards and personal protective equipment. Laboratory self-inspections were completed as required.

Recommendation: None

Section 6.6 Laboratory Workers maintained compliance with training obligations and reported spills and incidents in a timely manner. Where applicable, they also participated in the Medical Surveillance Program.

Recommendation: None

Section 6.7 Employee Stop Work Authority

Recommendation: Add a section discussing the Stop Work Authority for all campus employee, per the Campus Injury and Illness Prevention Plan.

IV. Section 7 Standard Operating Procedures

Section 7 includes general standard operating procedures for housekeeping, hygiene unattended operations, protective clothing and categories of chemical hazards. The assessment under this section is based on observations of the CHO as well as the annual inspection.

In general, laboratories were in compliance with the requirements of this section. Housekeeping, particularly related to materials spilled on balances or in fume hoods were addressed appropriately. Personal protective equipment was consistently worn by faculty and staff and the policy was enforced for students.

Recommendations:

- It is recommended that under protective clothing it be added that minimum safety attire to enter a chemical laboratory be closed toe/heel footwear and long pants, with no exposed skin between the bottom of the pants and the closed toe footwear.
- It is recommended that an addition be made addressing service animals and minors in laboratories. While service animals and minors are permitted, it is recommended that safety precautions be discussed between the university member in charge of the laboratory space and any guests entering their location.
- Section 7.7 should include wording describing that chemicals are not to be left out of their locked storage area. I.e. Chemical cabinets, flammable storage cabinets, behind locked doors in the room designated for the storage of chemicals.
- Section 7.7 should include wording describing the use of secondary containment to store compatible chemicals.
- The NSM Safety Manager and CHO are in the process of creating new SOPs for general and more specific processes that will improve understanding of hazards and appropriate methods of control. It is recommended that the Chemical Hygiene Plan include the general SOPs and, when developed, the college laboratory safety manual include SOPs for specific operations.

V. Section 8 Control Measures and Equipment

Observations by the CHO confirm that hazardous operations are performed in laboratory fume hoods. All fume hoods were tested during the spring semester and deficiencies were resolved quickly by Facilities Management. Emergency eyewashes and showers were present where required. A small fraction of eyewashes were not tested or not recorded on the tag as required and this finding was addressed immediately. It was also noted that faculty spaces which are in general not used over the summer were not tested. EH&S has assumed the responsibility for testing in vacant rooms. Containers of chemicals were appropriately labelled in accordance with regulations.

Recommendations: In each laboratory that uses hazardous chemicals, it is recommended that an emergency spill kit be made available to assist users in spill control and clean up.

VI. Section 9: Medical Consultation and Monitoring

The use of proper personal protective equipment and engineering controls will eliminate exposure to hazardous chemicals and medical surveillance is not required for most laboratory workers. Although Instructional Support Technicians in Chemistry follow proper procedures, it is recognized that they have an increased risk of exposure due to the tasks they perform. All ISTs are participating in the Medical Surveillance Program at no cost to the employee. All exams are performed during the employee's regular shift and records are maintained by Kaiser on the Job, the campus provider.

Recommendation: None

VII. Section 10: Particularly Hazardous Substances

Particularly hazardous substances include carcinogens, reproductive toxins or substances with a high degree of acute toxicity. When working with these chemicals procedures for reducing exposure, warning signage and establishment of designated work areas must be in place. The current CHP does not clearly state the requirement for completion of an SOP to document hazard controls and emergency response procedures, but does include the need for completion of an Assessment using the RSS software, a tool used to assist in identifying appropriate PPE and control measures.

Recommendation: It is recommended that when laboratories use particularly hazardous substances, they should have Standard Operating Procedures constructed for the safe use of those substances.

VIII. Section 11: Training

EH&S is responsible for providing general laboratory safety students to faculty and staff on a 3 year refreshed frequency. The laboratory supervisor is responsible for training students and staff on laboratory-specific processes.

EH&S has provided the required training in instructor-led and computer-based formats and laboratory specific training is being completed by the responsible party.

Recommendation: None

IX. Section 12 Approval Procedures

Approval is required for particularly hazardous substances when there is a risk of exposure or when a chemical exposure is likely to exceed the Permissible Exposure Limits established by Cal/OSHA. In addition to chemical exposures exceeding the established occupational exposure limits, this section should also require the development of SOPs and the approval of the CHO and/or the NSM Safety Manager where chemicals or procedures may result in a physical hazard.

Recommendation: Use of chemicals that are air or water reactive as well as asphyxiating or highly flammable gases should also require the development of an approved SOP. Other chemicals that present a high degree of acute toxicity, including hydrofluoric acid, should also be included. Assessments and SOPs developed for this section require annual review.

X. Section 13 Procurement and Gifts

This section provides general guidance on the procurement of chemicals with very few prohibitions or additional controls. Establishing clear procedures for procurement and approval of highly hazardous chemical agents would significantly reduce the potential for an exposure, injury or property damage.

Recommendation: EH&S will work with Procurement Services to establish guidelines for procuring chemicals that are extremely hazardous, carcinogenic or reproductive toxins.

XI. Section 14 Accidents and Chemical Spills

This section was completely revised by Risk Management and NSM representatives in spring 2018. The revision clearly describes the difference between an incidental or "simple" spill which can be managed by trained campus employees and a "complex" spill which required assistance from emergency responders.

Recommendation: None

XII. Section 15 Hazardous Waste Management

EH&S is responsible for the removal of hazardous waste from collection areas on campus and managing the disposal of wastes through our hazardous waste management contractor. Waste has been managed appropriately and there have been no regulatory violations during this review period.

Recommendation: None

XIII. Section 16: Records and Recordkeeping

EH&S has maintained records in accordance with this document. Workers' Compensation maintains injury records.

Recommendations: None

XIV. Section 17: Changes to the Chemical Hygiene Plan

This section identifies the process for updating the CHP.

Recommendations: None

XV. Section 18: Definitions

Terms used in the CHP

Recommendations: None

XVI. Summary

The present Chemical Hygiene Plan was written in 2003, with the exception of the spill chapter which was revised in January 2019 to include the recommendations provided in the

previous annual report on effectiveness. Although training completion records, the absence of significant spills and minor non-compliant conditions noted during inspections indicate overall program effectiveness, there are opportunities to improve the document and improve the safety culture. With support from college and department level safety committees, NSM and Risk Management Services should consider the recommendations provided and revise the existing document.