



San Francisco State University

Chemical Hygiene Program May 8, 2014

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1.0 Purpose

San Francisco State University (referred to as University in this document) is committed to providing a safe and healthful workplace and educational environment for its faculty, staff, principal investigators, and students. In its efforts to ensure the protection and well-being of its staff, students, and members of the public, University has elected to expand its Chemical Hygiene Program beyond the scope of Cal/OSHA's Occupational Exposure to Hazardous Chemicals in Laboratories Standard, California Code of Regulations, Title 8 (CCR, T8), Section 5191, to include the fine arts laboratories in addition to its science and engineering laboratories as appropriate.

The University's research and educational activities are complex. It would be difficult for a single chemical hygiene compliance program document to adequately serve the University's needs. The University Chemical Hygiene Program provides a foundation and direction to college and department specific chemical hygiene programs and addendums.

This program was established to protect the University community from health and physical risks associated with the presence of hazardous chemicals and substances in laboratories and to ensure effective controls are in place to keep hazardous material exposures below the permissible exposure limits (PEL) specified in Title 8 of the California Code of Regulations, (CCR, T8), Section 5155 (table ac-1).

Members of the University community may encounter potential physical, biological, radioactive, or other hazards in laboratories or shops that are regulated by Cal/OSHA standards other than CCR, T8, Section 5191. In the event there is a conflict among provisions of the various standards, the University Chemical Hygiene Officer will provide assistance in resolving the discrepancy. Questions regarding this program should be directed to the University Chemical Hygiene Officer.

2.0 Responsibilities

Every member of the University community bears responsibility for providing and maintaining a safe and healthful educational and occupational environment. University employees shall comply with federal, state, and local laws and regulations, as well as CSU and SF State safety and health rules, regulations, policies, and programs in the performance of their work.

2.1. President

The President of the University provides supportive leadership for the Chemical Hygiene Program and ensures that members of the President's Cabinet take the steps necessary to provide the leadership and financial support that will result in an effective Chemical Hygiene Program. The President is responsible for:

- Providing the Vice President and CFO, Administration and Finance, the Director, Environmental Health and Safety and the University Chemical Hygiene Officer with the appropriate authority to enforce the requirements of the University Chemical Hygiene Program
- Providing leadership and support to the Vice President and CFO, Administration and Finance for corrective actions required to mitigate safety and health risks and for proactive measures designed to provide for the safety and health of the campus community

2.2. President's Cabinet

Members of the President's Cabinet provide leadership, support, and resources, within their sphere of responsibilities and influence and are responsible for the implementation and maintenance of the University Chemical Hygiene Program. The Vice President and CFO, Administration and Finance, is specifically delegated with responsibility for the University Chemical Hygiene Program.

2.3. Director, Environmental Health and Safety

Under the direction of the Vice President and CFO, Administration and Finance, the Director, Environmental Health and Safety provides consultative guidance, assistance and support to the Chemical Hygiene Program, and is responsible for:

- Providing technical, consultative assistance and support to Associate Vice Presidents and Deans in the development, implementation, and maintenance of their Chemical Hygiene Programs and standard operating procedures
- Assisting the University Chemical Hygiene Officer as appropriate in educating the University community about the University Chemical Hygiene Program
- Providing oversight of loss incident investigations

2.4. University Chemical Hygiene Officer

The University Chemical Hygiene Officer reports to the Director, Environmental Health and Safety and is responsible for:

- Developing:
 - The University Chemical Hygiene Program and submitting it to the Director, Environmental Health and Safety for approval
 - The forms for documenting principal investigators' checking into and out of their assigned laboratories
- Administering the University's Chemical Hygiene Program
- Providing:
 - Oversight for the University's Radiation and Laser Safety Programs, inclusive of compliance auditing and program revision approval
 - Technical consultation to college and department Chemical Hygiene Officers
- Reviewing:
 - The University Chemical Hygiene Program annually for accuracy and appropriateness and sending a review report, inclusive of proposed changes, to the Vice President and CFO, Administration and Finance, and the Director, Environmental Health and Safety
 - And approving college/department-specific Chemical Hygiene Programs and standard operating procedures for the use of hazardous chemicals, substances, and operations
 - And responding to employee and student chemical hygiene safety and health concerns
- Working with the College of Science and Engineering, Liberal and Creative Arts, Health and Social Sciences, Facilities and other department subject matter experts to:



- Approve/reject hazardous chemical and substance procurement proposals
 - Maintain a master list of hazardous chemicals and substances approved for use at the University
- Monitoring college and department compliance with the requirements of the University Chemical Hygiene Program and the college/department-specific Chemical Hygiene Programs, including reviewing reports and documentation submitted by the colleges and departments regarding:
 - Chemical hygiene safety and health orientation for faculty, staff, and principal investigators
 - Safety and health training associated with standard operating procedures for the use of hazardous chemicals, substances, and operations, as well as other associated safety and health programs
 - The status of safety inspections
 - The status of chemical inventories
 - The status of Safety Data Sheet (SDS) collections
 - The status of engineering controls
 - Program changes
- Reporting:
 - The status of Chemical Hygiene Program compliance of colleges and departments to the Director, Environmental Health and Safety
 - Loss incidents and incident investigation findings to the Director, Environmental Health and Safety, the Associate Vice President, Risk Management, and the Dean of the college in which loss incidents occur
- Forming and facilitating the operation of a University Chemical Hygiene Committee
- Ensuring:
 - University Chemical Hygiene Committee agendas and minutes are maintained appropriately
 - Routine chemical sweeps are conducted to identify and remove expired chemicals and substances, prohibited chemicals and substances, and hazardous and universal waste
- Participating in the investigations of loss incidents that occur within the scope of the Chemical Hygiene Program
- Conducting unannounced safety inspections of the laboratories, classrooms, stockrooms, and waste storage areas as appropriate and reporting the findings to the Director, Environmental Health and Safety, as well as the Dean and Chemical Hygiene Officer of the college where the inspections were conducted
- Working with:
 - The Purchasing Department to ensure only authorized hazardous chemicals and substances are purchased
 - College Chemical Hygiene Officers, faculty members and administrators to identify and procure suitable alternatives for unauthorized hazardous chemicals and substances

2.5. Deans and Associate Deans

Deans and Associate Deans of colleges whose classrooms, laboratories, and/or workroom activities include the use of hazardous chemicals or substances are responsible for ensuring the development, implementation, and effective management of a Chemical Hygiene Program specific to their college operations and hazard exposures. Responsibilities include, but are not limited to:



- Collaborating with the University Chemical Hygiene Officer to select and retain a competent Chemical Hygiene Officer for the college
- Ensuring:
 - A college Chemical Hygiene Program, with department-specific standard operating procedures, is developed and appropriately distributed
 - The formation of a college Chemical Hygiene Committee
 - The appointment of two representatives to the University Chemical Hygiene Committee; one of which shall be the college's Chemical Hygiene Officer
 - Chemical procurement policies are followed by faculty, staff, principal investigators, and students
 - Safe chemical and material storage practices are followed
 - Chemical waste is disposed of in accordance with the University's Hazardous Materials Management procedures and all federal and state requirements
 - Accurate hazardous chemical and substance inventories are maintained
 - The appropriate SDSs are maintained
 - Standard operating procedures are followed
 - Documented safety inspections are completed
 - Emergency response equipment is routinely inspected
 - Fume hood inspections are routinely conducted
 - Appropriate review and approval of any work involving particularly hazardous chemicals and substances and particularly hazardous procedures
- Review and approval/acknowledgement of reports provided to the University Chemical Hygiene Officer from or with regard to the college.
- Review and approval of annual reports provided to the University Chemical Hygiene Officer with regard to the college's:
 - Hazardous chemical and substance inventories
 - SDS maintenance
- Providing necessary resources, oversight and/or support to ensure:
 - Staffing of a competent Chemical Hygiene Officer for the college
 - Faculty and staff are provided the appropriate personal protective equipment
 - Faculty and staff are provided appropriate medical monitoring
 - Laboratories have appropriate emergency response equipment
 - Compliance with safe chemical and material storage practices
- Educating employees about and enforcing compliance with the University and college Chemical Hygiene Programs

2.6. Department Chairs

Department Chairs of departments whose classrooms, laboratories, and/or workroom activities include the use of hazardous chemicals or substances are responsible for ensuring the development, implementation, and effective management of a Chemical Hygiene Program specific to their department operations and hazard exposures. Responsibilities include, but are not limited to:

- Ensuring:
 - The development of department-specific standard operating procedures for the use of hazardous chemicals, substances, and operations, and submitting those procedures to the college's Chemical Hygiene Officer for approval
 - Accurate hazardous chemical and substance inventories are maintained



- Appropriate SDSs are maintained
- Documented safety inspections are completed
- Emergency response equipment is routinely inspected
- Fume hood inspections are routinely conducted
- All shared laboratories are supervised by a competent (as defined in Appendix C) college employee
- Chemical waste is disposed of in accordance with the University's Hazardous Materials Management procedures and federal and state requirements
- Attending the college's Chemical Hygiene Committee meetings as assigned or appropriate
- Educating employees about, complying with and enforcing the University's procurement policies with respect to hazardous chemicals and materials
- Providing appropriate review and approval of particularly hazardous work
- Review and approval/acknowledgement of reports provided to or about the department's operations with regard to:
 - Safety inspection completion
 - Emergency response equipment provision and accessibility
 - Fume hood inspections
 - Chemical hygiene safety and health training
- Review and approval of annual reports provided to the University Chemical Hygiene Officer with regard to the department's:
 - Hazardous chemical and substance inventories
 - SDS maintenance
- Educating employees about and enforcing:
 - The University and college Chemical Hygiene Programs, inclusive of the standard operating procedures for the use of hazardous chemicals, substances, and operations
 - Safe chemical and material storage practices

2.7. College Chemical Hygiene Officers

College Chemical Hygiene Officers report to the Dean of their assigned college and are accountable, with respect to chemical hygiene matters, to the University Chemical Hygiene program and officer as well. Responsibilities include, but are not limited to:

- Developing and maintaining:
 - A college-specific Chemical Hygiene Program, as outlined in appendix A
 - A list of approved chemicals and substances and submitting the list to the Dean and University Chemical Hygiene Officer each year for review and approval
- Developing and distributing the college's Chemical Hygiene Program
- Ensuring:
 - The development of appropriate standard operating procedures for the use of hazardous chemicals, substances, and operations and including them in the college's Chemical Hygiene Program
 - Meeting agendas and minutes are maintained for the college's Chemical Hygiene Committee and providing the agendas and minutes to the Dean and the University Chemical Hygiene Officer as requested or appropriate
 - Documented Chemical Hygiene Program orientation training is completed by all faculty, staff, and principal investigators in the college



- Appropriate, routine documented safety and health training is conducted
- Faculty, lab coordinators, and/or principal investigators submit monthly documented safety inspections, inclusive of a review of laboratory emergency response procedures and equipment
- The maintenance of accurate chemical inventories for the college
- Reviewing:
 - The College's Chemical Hygiene Program, inclusive of the standard operating procedures for the use of hazardous chemicals, substances, and operations annually for accuracy and appropriateness and updating it as appropriate
 - All college chemical and hazardous material procurement requests and ensuring that chemical procurement policies are followed
- Reviewing requests to procure unauthorized hazardous chemicals and substances with the Dean and University Chemical Hygiene Officer to ensure appropriate action is taken
- Coordinate and facilitate the development and effective operation of an ongoing Chemical Hygiene Committee for the College
- Participating:
 - On the University's Chemical Hygiene Committee
 - In chemical incident investigations and assisting in identifying control measures to prevent recurrence
- Conducting and documenting:
 - Random safety inspections, that include laboratory emergency response equipment, as requested or appropriate
 - "Check-in" and "check-out" procedures with principal investigators
- Educating employees about, monitoring and enforcing compliance with:
 - Safe chemical and material storage practices
 - Standard operating procedures for the use of hazardous chemicals, substances, and operations
- Working with:
 - The University Chemical Hygiene Officer to ensure laboratory fume hoods are routinely inspected
 - Environmental Health and Safety staff to ensure that hazardous waste is disposed of in accordance with the University's Hazardous Materials Management Program and federal and state requirements
- Maintaining an appropriate SDS for the college
- Educating employees about and enforcing compliance with the University and college Chemical Hygiene Programs
- Facilitating the provision of medical consultation and examination for employees who report an exposure to hazardous chemicals or substances
- Providing treating physicians with required information when employees require medical consultation and/or examination
- Informing employees/students who submit chemical hygiene safety concerns of the results of any reviews, findings, and any further actions
- Establishing exposure monitoring and medical surveillance for affected employees where exposure monitoring reveals an exposure level above the action level (or in the absence of an action level, the exposure limit) for a Cal/OSHA regulated substance as prescribed by the particular standard
 - Developing and submitting quarterly status reports to the Dean with regard to:



- The annual college Chemical Hygiene Program review, including a summary of changes/updates
- The college's Chemical Hygiene Committee meetings
- Chemical hygiene safety and health training
- Approved chemicals and substances
- Safety inspections
- Emergency response procedures and equipment
- Fume hood and other engineering control equipment inspections
- Control measures
- Developing and submitting annual reports to the Dean with regard to the college's:
 - Hazardous chemical and substance inventories
 - SDS maintenance

2.8. Faculty/Laboratory Coordinators/Principal Investigators

Faculty members, laboratory coordinators, and principal investigators are responsible to educate about, promote and enforce all applicable safety and health rules, regulations, policies, procedures, and safe practices with respect to their research, classes and/or other operations. Responsibilities include, but are not limited to:

- Complying with:
 - University and college environmental health and safety policies, programs, procedures, and practices
 - Safe chemical and material storage practices
 - Chemical spill response procedures
 - And enforcing the prohibition of the storage, preparation, and consumption of foods and beverages meant for human consumption in areas where chemical and/or hazardous substances are used and/or stored
- Annually reviewing the College's Chemical Hygiene Program, inclusive of the standard operating procedures for the use of hazardous chemicals, substances, and operations, for accuracy and appropriateness and submitting suggestions for updates/changes to the college Chemical Hygiene Officer
- Developing:
 - Standard operating procedures for the use of hazardous chemicals, substances, and operations, as well as other safe work practices for their areas of responsibility, using the format specified in Appendix B
 - Protocols to provide for the safety and health of approved service animals permitted in the laboratories and workshops
- Maintaining:
 - Accurate chemical and hazardous substance inventories and submitting the inventories to the college's Chemical Hygiene Officer
 - SDS for all chemicals and substances in use and submitting the copies of the SDS to the college's Chemical Hygiene Officer
- Participating in:
 - Routine environmental health and safety training
 - Loss incident investigations and assisting in identifying control measures to prevent recurrence
- Conducting and documenting:



- New laboratory worker safety training within 14 days of the worker's start date and prior to allowing them to work with hazardous chemicals or substances
- Routine environmental health and safety training for faculty, staff and/or students working/learning under their supervision
- Monthly safety inspections
- Completing annual chemical spill response training
- Maintaining:
 - A safe, healthful, and orderly environment, inclusive of offices, classrooms, laboratories, waste storage areas, and supply rooms
 - The required clearances around emergency response equipment, such as emergency eyewash and deluge shower stations, fire blankets, fire extinguishers, spill kits, and decontamination kits
- Cleaning their classrooms, laboratories, stockrooms, and supply rooms, if custodial staff are prohibited from entering these areas
- Submitting proposals for the procurement of unauthorized hazardous chemicals and substances to the college Chemical Hygiene Officer
- Ensuring:
 - All chemical and substance containers are labeled in accordance with the University's Hazard Communication Program
 - Only approved service animals and laboratory animals are allowed in the laboratories and workshops
 - All shared personal protective equipment is cleaned and sanitized between users
 - All shared laboratories are supervised by a competent (as defined in Appendix C) college employee
 - Appropriate safety information and warning signs are posted and kept visible in classrooms, laboratories, stockrooms, and supply rooms
 - Employees and students under their supervision receive medical consultation and/or examination when an exposure to hazardous chemicals or substances occurs
- Wearing appropriate personal protective equipment in the prescribed manner
- Keeping assigned personal protective equipment clean and sanitized
- Consulting with and obtaining authorization from the Associate Vice President, Capital Planning, Design & Construction, the Dean, the College Chemical Hygiene Officer and the University Chemical Hygiene Officer prior to making structural changes to their assigned areas, and/or appropriating areas not officially assigned for their use
- Working with their college's Chemical Hygiene Officer to:
 - Ensure all chemical and material wastes are routinely removed and properly disposed of throughout the course of their project
 - Ensure laboratory control equipment is properly maintained, inclusive of routine maintenance and servicing
 - Arrange for appropriate, pre-assignment health assessments for employees and students under their supervision
- Reporting suspected exposure to hazardous chemicals or substances to the Dean and the College Chemical Hygiene Officer
- Providing the college's Chemical Hygiene Officer with a list of current laboratory workers within the 14 days of the beginning of each semester



2.8.1. Principal Investigators – Additional Responsibilities

In addition to the responsibilities listed in the prior section, principal investigators are required to:

- Complete all:
 - “Check-in” documents when they move into their assigned work space(s)
 - “Check-out” documents when they move out of their assigned work space(s)
- Work with the College Chemical Hygiene Officer to ensure all hazardous chemicals, substances, and wastes are properly removed and disposed of prior to vacating assigned work spaces, inclusive of offices, laboratories, stockrooms, and storage areas

2.9. Stockroom Manager

Stockroom Managers are required to comply with all safety and health rules, regulations, policies, procedures, and safe practices and are also responsible for:

- Complying with:
 - The University’s and college’s environmental health and safety policies, programs, procedures, and practices
 - And enforcing the prohibition of the storage, preparation, and consumption of foods and beverages meant for human consumption in areas where chemical and hazardous substances are used and/or stored
 - Safe chemical and material storage practices
 - Chemical spill response procedures
- Ensuring:
 - Only approved service animals and laboratory animals are allowed in the laboratories and workshops
 - All chemical and substance containers are labeled in accordance with the University’s Hazard Communication Program
 - All shared personal protective equipment is cleaned and sanitized between users
 - Appropriate safety information and warning signs are posted and kept visible in the stockroom and waste storage areas
- Submitting proposals for the procurement of unauthorized hazardous chemicals and substances to the College Chemical Hygiene Officer
- Annually reviewing the college’s Chemical Hygiene Program and safe storage practice documents for accuracy and appropriateness and submitting suggestions for changes/updates to the college’s Chemical Hygiene Officer
- Maintaining a safe, healthful, and orderly environment, inclusive of offices, laboratories, stockrooms, and waste storage areas
- Wearing appropriate personal protective equipment in the prescribed manner
- Keeping assigned personal protective equipment clean and sanitized
- Maintaining the required clearances around emergency response equipment, such as emergency eyewash and deluge shower stations, fire blankets, fire extinguishers, spill kits, and decontamination kits
- Completing annual chemical spill response training
- Reporting suspected exposure to hazardous chemicals or substances to the college Dean and the College Chemical Hygiene Officer

- Participating in:
 - Environmental health and safety training
 - Loss incident investigations and assisting in identifying control measures to prevent recurrence

2.10. Staff – Support and Custodial

Staff members providing laboratory and workshop support and custodial services may have exposures to hazardous chemicals and substances and are therefore responsible for:

- Complying with the University's and college's environmental health and safety programs, procedures, and practices
- Obtaining appropriate authorization prior to entering areas where hazardous chemicals and substances are used or stored
- Participating in:
 - Chemical hygiene orientation and training prior to entering areas where hazardous chemicals and substances are used or stored
 - Loss incident investigations and assisting in identifying control measures to prevent recurrence
- Wearing appropriate personal protective equipment in the prescribed manner in areas where such personal protective equipment is required
- Completing annual hazardous spill response awareness training
- Reporting suspected exposure to hazardous chemicals or substances to their immediate supervisor and the College Chemical Hygiene Officer

2.11. Chemical Hygiene Committees

Chemical Hygiene Committees provide knowledge, experience, and insight into the use, handling, and storage of hazardous chemicals and substances. Chemical Hygiene Committees will:

- Meet at least bi-monthly
- Maintain written meeting agendas and minutes
- Review college/department Chemical Hygiene Program documents annually
- Participate in the development of standard operating procedures for the use of hazardous chemicals, substances, and operations
- Review requests for the procurement of chemicals and substances not on the approved hazardous chemical and substance list
- Review loss incident reports and contribute to the development of control measures to prevent recurrence
- Annually review the effectiveness and appropriateness of college and departmental control measures
- Review College Chemical Hygiene Officer status reports regarding:
 - Safety and health training
 - Safety inspections
 - Employee and student chemical hygiene safety and health concerns
- Review Chemical Hygiene Officer annual reports regarding:
 - Chemical inventories

2.12. Students

Students, although not employees, may be at risk of exposure to hazards associated with laboratories and workshop activities that involve hazardous chemicals and substances. Therefore, students are responsible for:

- Complying with:
 - The University's and college's environmental health and safety programs, procedures, and practices
 - Standard operating procedures for the use of hazardous chemicals, substances, and operations, as well as other safe work practices
 - All posted safety information and warning signs
 - The prohibition of the storage, preparation, and consumption of foods and beverages meant for human consumption in areas where chemical and hazardous substances are used and/or stored
 - Protocols to provide for the safety and health of approved service animals permitted in the laboratories and workshops
- Obtaining appropriate authorization prior to entering areas where hazardous chemicals and substances are used or stored
- Participating in chemical hygiene orientation and training prior to entering areas where hazardous chemicals and substances are used or stored
- Wearing appropriate personal protective equipment in the prescribed manner in areas where such personal protective equipment is required
- Submitting requests to the Dean for the use of any service animals in laboratories and workshops

2.13. Safety and Risk Management Department

The Safety and Risk Management Department facilitates the treatment of work-related injuries and illnesses and ensures that required baseline evaluations are conducted as required by specific Cal/OSHA standards outside the scope of CCR, T8, Section 5191. Therefore, the department is responsible for working with:

- Deans, Associate Deans, Department Chairs, Chemical Hygiene Officers, and Human Resources to identify new or reassigned employees requiring baseline evaluations prior to workplace exposures
- Deans, Associate Deans, Department Chairs, and Chemical Hygiene Officers to:
 - Provide employees with medical consultations and examinations
 - Return employees to work, when reasonably possible, when chemical or substance exposure restrictions are prescribed by a treating physician
- Physicians to obtain written opinions as specified by Section 8.0 of this program (Medical Consultation and Examinations)

3.0 Criteria for Implementation of Control Measures

College Chemical Hygiene Officers and Chemical Hygiene Committees are responsible for identifying hazards within their educational and research programs and implementing control measures to effectively mitigate employee and student exposure to those hazards. The control measures shall be formalized in College Chemical Hygiene Programs and standard operating procedures for the use of hazardous chemicals, substances, and operations.

3.1. Hazard Identification Methods

Multiple methods should be utilized to identify hazards, including, but not limited to:

- Hazardous chemical and substance inventories and SDS monitoring
- Environmental health and safety inspections
- Employee and student safety concern notifications
- Incident investigations
- Employee exposure monitoring

3.1.1. Inventory and Safety Data Sheet Reviews

Hazardous chemical and substance inventories will be maintained by each college's Chemical Hygiene Officer and the inventory status reported annually to the University Chemical Hygiene Officer. College Chemical Hygiene Officers will ensure there is a SDS available for every hazardous chemical and substance identified in the inventory.

Chemical Hygiene Officers will review the SDS to identify the hazards associated with the use and storage of the hazardous chemicals and substances and the protective measures identified by the material's manufacturer. This information will be used by the College Chemical Hygiene Officer and Chemical Hygiene Committee to develop appropriate laboratory-specific control measures.

3.1.2. Environmental Health and Safety Inspections

College Chemical Hygiene Officers will conduct documented environmental health and safety inspections to identify hazardous conditions and behaviors. The inspections shall be conducted:

- At least monthly
- Prior to the opening of a new laboratory or chemical/substances supply room
- Annually in conjunction with the college's Chemical Hygiene Program review
- After a loss incident occurs

Chemical Hygiene Officers will develop appropriate safety inspection forms and involve appropriate employees in the inspection process.

Inspection documentation shall be retained at least four years. College Chemical Hygiene Officers will provide quarterly inspection status reports to college Deans and the University Chemical Hygiene Officer.



3.1.3. Employee and Student Safety Concern Notifications

Faculty, principal investigators, staff, and students shall be encouraged to share environmental health and safety concerns with their college's Chemical Hygiene Officer and/or the University Chemical Hygiene Officer, without fear of reprisal. Voiced concerns shall be reasonably and thoroughly reviewed by the appropriate Chemical Hygiene Officer. Chemical Hygiene Committees may be asked to review and investigate concerns as well.

If a concern is investigated and confirmed to be accurate, steps shall be taken by the appropriate Chemical Hygiene Officer to develop and implement control measures. The control measures developed will be included in the college's Chemical Hygiene Program. The college's Chemical Hygiene Officer will inform the employee/student who submitted the concern of the results of the investigation, findings, and further actions.

3.1.4. Incident Investigations

The University's environmental health and safety programs, procedures, and practices are designed to reduce the risk of loss incidents which result in injury, illness, or property damage. When a loss incident does occur, it will be investigated by the College Chemical Hygiene Officer along with appropriate faculty, staff, and/or principal investigators. The Dean and University Chemical Hygiene Officer will be notified immediately of loss incidents and may participate in loss investigations as appropriate or necessary.

Incident investigations shall be conducted in a manner designed to ensure the identification of the incident's root causes. Control measures shall be developed to prevent a recurrence of the incident. Control measures will be included in appropriate Chemical Hygiene Programs.

A written report of the investigation and subsequent control measures shall be submitted to the Dean and the University Chemical Hygiene Officer.

3.1.5. Pre-Assignment Health Assessments

A baseline health assessment will be provided to laboratory personnel who work with chemicals known to be extremely hazardous to their health or that of their unborn children, such as carcinogens or reproductive toxins. Pre-assignment health assessments will establish a baseline health record and provide the basis for counseling employees on health matters related to the work environment. Pre-assignment health assessments may include:

- A work history
- A medical history
- Physical examination
- Appropriate laboratory studies
- Agent specific studies (examinations and/or laboratory tests), when available, to establish baseline values for any variables that are to be subsequently followed

If evidence of any risk factors or pre-existing conditions is confirmed, such as smoking, chronic use of medications, pre-existing disease, or pregnancy, laboratory personnel will be appropriately informed and counseled concerning the advisability of working in areas where the chemicals in question are used.

3.1.6. Employee Exposure Monitoring

Employee exposure monitoring will be conducted as needed based on a review of the hazardous chemical and substance inventory, a review of the SDSs, and Cal/OSHA requirements specific to the applicable hazardous chemicals or substances. When a College Chemical Hygiene Officer identifies a need for monitoring, he or she will contact the University Chemical Hygiene Officer to coordinate the monitoring activities. Personnel supervising, directing, or evaluating the monitoring will be competent in industrial hygiene practices. In-house monitoring will be conducted when the appropriate equipment and competent personnel are available. The University Chemical Hygiene Officer will determine when an outside source will be used to conduct the monitoring. Monitoring activities include:

- Initial monitoring. The University measures employee exposure to any substances regulated by a standard that requires monitoring if there is reason to believe exposure levels for that substance exceed the action level (or in the absence of an action level, the exposure limit).
- Periodic monitoring. If the initial monitoring prescribed by CCR, T8, subsection 5191(d)(1) discloses employee exposure over the action level (or in the absence of an action level, the exposure limit), the University will immediately comply with the exposure monitoring provisions of the relevant regulation.
- Termination of monitoring. Monitoring will be terminated in accordance with relevant regulations.
- Employee notification of monitoring results. The University shall, within 15 working days after the receipt of any monitoring results, notify the employee of the results in writing either individually or by posting results in an appropriate location that is accessible to employees.
- Student notification of monitoring results. The Vice President and Provost, Academic Affairs and the Vice President and CFO, Administration and Finance will determine on a case-by-case basis when student notification of monitoring results is appropriate and how such notification will be provided.

3.2. Exposure Control Measures

Exposure control measures will be implemented to ensure exposures to Cal/OSHA regulated substances do not exceed the exposure limits specified in California Code of Regulations, Title 8, Group 16, Section 5139 et seq., of the General Industry Safety Orders.

A variety of measures will be used to control exposure to hazardous chemicals and exposures. College Chemical Hygiene Officers will include specific control measures in the college's Chemical Hygiene Program and standard operating procedures for the use of hazardous chemicals, substances, and operations. Control measures will include, but not be limited to:

- Eliminating or reducing the hazard



- Engineering controls
- Administrative controls
- Personal protective equipment

3.2.1. Eliminating or Reducing Hazards

When reasonably possible, hazards will be eliminated or reduced through the use of alternative chemicals, substances, and/or procedures. Chemicals, substances, and procedures will be assessed during the development and annual review of standard operating procedures. The use of new chemicals and substances will be assessed as described in the procurement process described in Section 3.2.3.1.1 below.

3.2.2. Engineering Controls

Examples of engineering controls in use at the University include, but are not limited to:

- Local exhaust ventilation
- Laboratory fume hoods
- Biological safety cabinets
- Chemical storage cabinets; i.e., flammable, corrosives, acids
- Cold and warm rooms and equipment; i.e., refrigeration units, incubators, autoclaves
- Emergency response equipment; i.e., eyewash and deluge shower stations, spill kits, fire extinguishers, decontamination kits, radiation monitors, alarm systems

These control measures are described in Section 4.0 of this program (the Management of Engineering Controls).

3.2.3. Administrative Controls

A variety of administrative controls will be used when the use of hazard elimination and/or engineering control does not effectively or reasonably control the hazard exposure. Administrative controls include, but are not limited to:

- Hazardous chemical and substance acquisition procedures
- Standard operating procedures for the use of hazardous chemicals, substances, and operations
- Obtaining special permission for particularly hazardous substances and/or procedures
- Continuous exposure monitoring
- Training
- Disciplinary action
- Suspension or cessation of applicable operations/activities

3.2.3.1. Acquisition of Chemicals and Substances

Controlling the acquisition of hazardous chemicals and substances is an important component in ensuring a safe and healthful workplace and educational environment. The University shall control the acquisition of hazardous chemicals and substances



through procurement processes and through appropriate control of University donations.

3.2.3.1.1. Procurement

Only chemicals and substances identified on the approved hazardous chemical and substance list may be procured through the University's procurement process or obtained in any manner for use or storage at the University. The University Chemical Hygiene Officer is responsible for working with the Deans, College Chemical Hygiene Officers, and the Procurement Director to maintain an up-to-date list of approved hazardous chemicals and substances. Persons interested in acquiring hazardous chemicals and substances that are not on the list of approved chemicals and substances must submit a request to their college's Chemical Hygiene Officer. The request must include:

- The SDS for the desired chemical/substance
- The proposed use of the chemical/substance
- The standard operating procedures for the use of the hazardous chemical/substance
- The method of disposal for the chemical/substance
- The name of the person who will be responsible for ensuring the appropriate disposal of the excess chemical/substance and its associated hazardous/industrial wastes and byproducts

The college's Chemical Hygiene Officer will submit the request to the Dean and the University Chemical Hygiene Officer along with a recommendation for the approval or rejection of the use of the requested chemical or substance.

The University Chemical Hygiene Officer, in consultation with the appropriate Dean, will make a final decision regarding the requested chemical or substance. A notification of the decision and any special instructions will be provided to:

- the requesting party
- the college's Chemical Hygiene Officer
- the Purchasing Department
- the Liberal & Creative Arts Specialist

Decisions of the University Chemical Hygiene Officer may be reviewed and overturned by the Vice President and Provost, Academic Affairs and the Vice President and CFO, Administration and Finance.

3.2.3.1.2. Donations

The acceptance of unauthorized, donated, hazardous chemicals and substances is strictly prohibited.

3.2.3.1.3. Personal Purchasing or Procurement of Hazardous Chemicals and Substances



Employees (including faculty, staff, principal investigators, and volunteers) and students are prohibited from bringing hazardous chemicals or substances, including consumer products containing hazardous chemicals or substances, into University facilities for personal use or for any other purpose, without authorization from the College or University Chemical Hygiene Officer via a request as described in Subsection 3.2.3.1. – Acquisition of Chemicals and Substances.

3.2.3.2. Discipline

Failure to comply with the chemical acquisition processes may result in disciplinary action, as per the provisions of the applicable collective bargaining agreement.

3.2.3.3. Standard Operating Procedures

Standard operating procedures for the use of hazardous chemicals, substances, and operations will be developed as specified in Section 5.0 of this program (Standard Operating Procedures). Standard operating procedures will be based on a hazard assessment that identifies necessary or appropriate control measures, as well as relevant, potential hazards.

3.2.3.4. Authorization for Particularly Hazardous Chemicals, Substances, and Procedures

Authorization must be obtained prior to the acquisition or use of particularly hazardous chemicals and substances and prior to the use of particularly hazardous procedures as specified in the Section 6.0 of this program (Particularly Hazardous Chemicals, Substances, and Procedures).

3.2.3.5. Exposure Monitoring

Monitoring exposure to hazardous chemicals and substances shall be conducted as described in Section 3.1.5 of the University Chemical Hygiene Program. Some procedures may require continual monitoring through the use of sensing devices with or without audible alarms. Deans, Associate Deans, Department Chairs and College Chemical Hygiene Officers are responsible for ensuring such devices are provided when necessary or appropriate and for ensuring the use of such devices as specified in the standard operating procedures.

3.2.3.6. Training

Training and information shall be provided to reasonably ensure that faculty, principal investigators, staff, and students are competent to recognize hazards and take appropriate steps to control exposure to the hazards. Training shall be provided as prescribed Section 9.0 of this program (Information and Training).

3.2.3.7. Disciplinary Action

Employees who fail to comply with University or College Chemical Hygiene Programs or other CSU or SF State environmental health and safety programs, policies, and procedures are subject to possible disciplinary action, up to and



including termination, in accordance with CSU and SF State disciplinary policies and the provisions of applicable collective bargaining agreements.

Students who fail to comply with University or College Chemical Hygiene Programs or other CSU or SF State environmental health and safety programs, policies, and procedures are subject to possible disciplinary action in accordance with the University's applicable Student Conduct policies.

3.2.4. Personal Protective Equipment (PPE)

Deans, Associate Deans, Department Chairs and College Chemical Hygiene Officers shall ensure that appropriate PPE is made available and appropriately utilized by employees and students. PPE shall be appropriate to mitigate the hazards identified in the applicable hazard analysis, conducted during the development of the applicable standard operating procedures and control measures. Required PPE shall be specified in the standard operating procedures contained in each college's Chemical Hygiene Program. Informational signs regarding the use of PPE shall be posted in classrooms, laboratories, stockrooms, and waste collection areas.

Employees and students shall be educated and trained in the purpose, limitations, appropriate use of, and means of cleaning the PPE provided.

4.0 Management of Engineering Controls

The University shall utilize appropriate engineering controls to reduce exposure to hazardous chemicals and substances. Appropriate engineering controls will vary and are dependent on the risk and type of exposure and changes in available technology. College Deans, Associate Deans, Department Chairs and College Chemical Hygiene Officers shall ensure that appropriate engineering controls are provided. College Chemical Hygiene Officers shall monitor the use and effectiveness of the engineering controls within the college. Examples of engineering controls include, but are not limited to:

- Local exhaust ventilation
- Laboratory fume hoods
- Biological safety cabinets
- Chemical storage cabinets; i.e., flammable, corrosives, acids
- Cold and warm rooms and equipment; i.e., refrigeration units, incubators, autoclaves
- Emergency response equipment; i.e., eyewash and deluge shower stations, spill kits, fire extinguishers, decontamination kits, radiation monitors, alarm systems

4.1. Provision of Engineering Controls

College Chemical Hygiene Officers will:

- Develop and maintain an inventory of engineering controls within their area of responsibility
- Ensure engineering controls are assessed annually for performance and adequacy
- Suspend college operations where engineering controls are inadequate



- Provide the college Dean and the University Chemical Hygiene Officer with an annual engineering controls status report identifying the adequacies and deficiencies of college engineering controls
- Collaborate with the college Chemical Hygiene Committee and the University Chemical Hygiene Officer to identify necessary or appropriate changes in the provision of engineering controls

4.2. Inspection of Engineering Controls

College Chemical Hygiene Officers will:

- Ensure the completion of monthly documented inspections of emergency response equipment with regard to placement, access, and function; emergency response equipment includes, but is not limited to, emergency eyewash and deluge showers, spill kits, fire blankets, fire extinguishers, decontamination kits, and alarm systems
- Ensure refrigeration unit temperature monitoring is conducted, that units are properly labeled, and that units are used in accordance with their labeling
- Collaborate with the University Chemical Hygiene Officer to ensure fume hoods are tested and certified annually by a qualified inspector
- Collaborate with the Executive Director, Facilities and Service Enterprises, to ensure the completion of an annual inspection of fire extinguishers and fire suppression systems by qualified providers

5.0 Standard Operating Procedures

College operations involving the use of hazardous chemicals or substances vary widely at the University. Therefore, each college Chemical Hygiene Officer shall ensure the development and effective use of college-appropriate standard operating procedures for the use of hazardous chemicals, substances, and for hazardous processes. Standard operating procedures shall be included in the college's Chemical Hygiene Program. For large, complex operations, such as the College of Science and Engineering, standard operating procedures shall be developed for individual departments as appropriate. Faculty members, principal investigators, and staff managers shall develop appropriate and effective standard operating procedures and safe work practices for their areas of responsibility, following the format specified in Appendix B. Standard operating procedures shall be provided to the college's Chemical Hygiene Officer.

Standard operating procedures shall be based on a hazard analysis conducted to identify anticipated and potential health and physical hazards associated with hazardous chemicals and substances, both expected and reasonably unexpected, that may result from the use and handling and storage of chemicals and substances. Standard operating procedures shall include a description of appropriate control measures needed or appropriate to eliminate or reduce the risks identified in the hazard analysis.

6.0 Particularly Hazardous Chemicals, Substances, and Procedures

Special consideration will be given to the use of particularly hazardous chemicals, substances, and/or procedures. Examples of particularly hazardous chemicals are given in Chapter 3 of *Prudent Practices in the Laboratory (1995)*, which is available for online reading at www.nap.edu/catalog.php?record_id=4911 (*ibid*, Chapter 4 of the 2011 update, available at http://www.nap.edu/catalog.php?record_id=12654)

6.1. Working with Particularly Hazardous Chemicals and Substances

When laboratory procedures include the use of highly hazardous substances, special precautions shall be implemented as deemed necessary or appropriate by the Dean, Associate Dean, Department Chair, College Chemical Hygiene Officer, and/or the University Chemical Hygiene Officer. Special precautions will be developed for work with select carcinogens, reproductive toxins, and substances that have a high degree of acute toxicity or physical hazard. Consideration should be given to the following issues when developing special procedures:

- Establishment of designated areas, appropriate signage and access controls for the use of high hazard chemicals or substances
- Special precautions, such as use of glove boxes or other containment devices
- Enclosure or isolation of contaminated equipment
- The use of effective, best-practice laboratory hygiene
- Safe transportation of very toxic chemicals and substances
- Planning for accidental releases and spills
- Special storage and waste disposal practices

6.2. Pre-approval of Particularly Hazardous Work

Laboratory activities that do not follow standard or special operating procedures represent particularly hazardous operations and increase potential exposure to loss incidents for faculty, principal investigators, staff, and students. Therefore, prior to the initiation of any particularly hazardous operations, including off-hours work, sole occupancy of laboratories, and unattended operations, the Dean will provide written pre-approval for the work in the form of a completed and signed work permit. The Dean shall inform the College Chemical Hygiene Officer and University Chemical Hygiene Officer of the approved work.

The toxicity of the chemicals used, the hazards of the procedures to be done, and the knowledge and experience of the laboratory occupants should be considered in deciding which work will be allowed with pre-approval.

- Off-Hours Work Procedures: Laboratory personnel are not allowed to work after hours in the laboratories, except when permit conditions are met.
- Working Alone: Work shall not be performed in the laboratory when the only person in the room is the laboratory person performing the work. Under unusual conditions, activities such as crosschecks, periodic security guard checks, or other measures may be taken as specified in the permit.
- Unattended Operations: When laboratory operations are performed that will be unattended by laboratory personnel (continuous operations, overnight reactions, etc.), the following procedures will be employed:
 - The completed permit will be posted
 - A sign will be posted at all entrances to the laboratory
 - The overhead lights in the laboratory will be left on if possible
 - Precautions shall be made for the interruption of utility services during the unattended operation (loss of water pressure, electricity, etc.)
 - The person responsible for the operation will return to the laboratory at the conclusion of the operation to assist in the safe dismantling of the apparatus

7.0 Emergency Response to Chemical Spills, Releases, and Incidents

In addition to the University's Emergency Response Plan, each college will develop emergency response procedures specific to its operations and hazards. Deans, Associate Deans, Department Chairs and College Chemical Hygiene Officers are responsible for ensuring appropriate emergency response equipment is provided.

Emergency response equipment may include, but is not limited to:

- Emergency eyewash and deluge shower stations
- Spill response kits appropriate to the chemicals likely to be released in the area
- Fire extinguishers appropriate to the chemicals and substances in the area
- Fire blankets
- Decontamination kits
- Radiation sensors

Faculty, principal investigators, staff, and the college's Chemical Hygiene Officer are responsible for:

- Ensuring that unimpeded access to emergency response equipment is provided at all times
- Ensuring that emergency response equipment is maintained in a condition that allows for its immediate use
- Ensuring that a list of emergency contact telephone numbers, and the names of the personnel associated with those telephone numbers, is posted in each classroom, laboratory, stockroom, and waste collection area; the list of emergency numbers will include:
 - Emergency Medical Response
 - University Emergency Response Personnel
 - University Chemical Hygiene Officer
 - College Chemical Hygiene Officer
 - Poison Control Center
 - Local Fire Authority
 - Local Police Agency
 - Dean

8.0 Medical Consultation and Examinations

The University shall provide employees who work with hazardous chemicals and substances an opportunity to receive appropriate medical attention, including any follow-up examinations the examining physician determines to be necessary or appropriate, under the following circumstances:

- If an employee develops signs or symptoms associated with a hazardous chemical or substance to which the employee may have been exposed in the workplace. The College Chemical Hygiene Officer and the Safety and Risk Management Department will ensure that the employee is provided an opportunity to receive an appropriate medical examination.

- Where exposure monitoring reveals an exposure level above the action level (or in the absence of an action level, the exposure limit) for a Cal/OSHA regulated substance for which there are exposure monitoring and medical surveillance requirements, the College Chemical Hygiene Officer will establish medical surveillance for the affected employee as prescribed by the particular standard.
- Whenever an event takes place in the work area such as a spill, leak, explosion, or other occurrence resulting in the likelihood of a hazardous exposure, the affected employee will be provided an opportunity for a medical consultation; such consultation will be for the purpose of determining the need for a medical examination.
- As part of the University's medical surveillance program
- When baseline medical examinations are required by applicable Cal/OSHA standards

The University's Safety and Risk Management Department will ensure that all medical examinations and consultations are performed by or under the direct supervision of a licensed physician without cost to the employee, without employee loss of pay, and at a reasonable time and place.

College Chemical Hygiene Officers will work with the Safety and Risk Management Department to ensure that the following information is provided to the physician:

- The identity of the hazardous chemical(s) to which the employee may have been exposed;
- A description of the conditions under which the exposure occurred including quantitative exposure data, if available; and
- A description of the signs and symptoms of exposure the employee is experiencing, if any.

The University's Safety and Risk Management Department will obtain a written opinion from the examining physician that will include the following:

- A statement that the employee has been informed by the physician of the results of the consultation or medical examination and any medical condition that may require further examination or treatment
- A statement of any recommendation for further medical follow-up
- A statement of the results of the medical examination as they pertain to the exposure and any associated tests, as requested by the employee
- A statement of any medical condition, revealed in the course of the examination that may place the employee at increased risk as a result of exposure to hazardous chemicals and substances found in the workplace

9.0 Information and Training

Information and knowledge are critical to the ability of faculty, staff, principal investigators, and students to identify hazardous situations, and take appropriate, effective action to ensure their safety and health. Therefore, the University and College Chemical Hygiene Officers shall ensure that faculty, staff, principal investigators, and students covered by College and/or University Chemical Hygiene Programs routinely receive adequate and effective safety and health information and training.

9.1. Provision of Information

Safety and health information will be provided on a continuous and routine basis and will include, but shall not be limited to:

- Access to the University's safety, health, and compliance programs, including, but not limited to:
 - The University's Chemical Hygiene Program
 - College Chemical Hygiene Programs
 - The University's Hazardous Materials Management Program
 - The University's Hazard Communication Program

Written, hard copy programs will be available for review in the:

- Office of the Dean
- Office of the Department Chair/Director/Unit Head
- Office of the College Chemical Hygiene Officer
- Office of the University Chemical Hygiene Officer, and
- Safety and Risk Management Department

Copies of programs shall also be available for review at the University's website.

- Information and warning signs posted in classrooms, laboratories, supply rooms, stockrooms, and waste storage areas
- Bulletins, memos, and posters displayed on bulletin boards located in the hallways, offices, classrooms, laboratories, stockrooms, and break areas
- Information distributed electronically
- The names and telephone numbers of current holders of key responsible positions identified in the responsibilities section of the Chemical Hygiene Program and the Emergency Response Program. This information will be posted on bulletin boards in classrooms, laboratories, stockrooms and break rooms as appropriate.

9.2. Chemical Hygiene Committees

The University Chemical Hygiene Officer will form a University Chemical Hygiene Committee to address chemical hygiene concerns that affect the University's colleges and departments. The University's Chemical Hygiene Committee will be comprised of the:

- Director, Environmental Health and Safety
- University Chemical Hygiene Officer
- Dean, College of Science and Engineering
- Dean, College of Liberal and Creative Arts
- Dean, College of Health and Social Sciences
- University Radiation Officer
- University Laser Officer

The University Chemical Hygiene Officer will chair the University Chemical Hygiene Committee and will ensure the Committee completes its duties as described in this program. The Committee will meet at least bi-monthly. The agendas and minutes of the University's

Chemical Hygiene Committee will be provided to the Vice President and Provost, Academic Affairs and the Vice President and CFO, Administration and Finance.

Each college Chemical Hygiene Officer will form and chair a College Chemical Hygiene Committee to address the chemical hygiene concerns associated with college operations and will ensure the Committee completes its duties as described in this program. College Chemical Hygiene Committees will meet at least bi-monthly. Meeting agendas and minutes will be provided to the University Chemical Hygiene Officer and shall be posted on the college's employee bulletin boards.

The college's Chemical Hygiene Program will specify the method by which the Chemical Hygiene Committee members will be selected. Each college Chemical Hygiene Committee will be comprised of members equally distributed among the college's departments and among management, faculty, and staff.

9.3. Provision of Training

Safety and health training will be provided on a routine basis, but not less than:

- At initial assignment and prior to working with hazardous chemicals or substances, or working in areas where hazardous chemicals or substances are stored or used; training will be completed within 14 days of the employee's start date
- When new exposures have been recognized
- When behaviors indicate a need for refresher training
- When refresher training is specified by the University Chemical Hygiene Officer, or the college's Chemical Hygiene Officer

The University Chemical Hygiene Officer will ensure the provision of environmental, health and safety training for College Chemical Hygiene Officers.

Each college Chemical Hygiene Officer will ensure the provision of appropriate environmental health and safety training for the college Dean, faculty, principal investigators, and staff within the college.

Faculty, principal investigators, and staff managers/supervisors shall provide employees and students under their supervision with appropriate and effective training with regard to the University and College Chemical Hygiene Programs and standard operating procedures for the use of hazardous chemicals, substances, and operations. Training shall be completed within 14 days of employment for employees and volunteers and within 14 days of the start of the semester for students.

9.3.1. Chemical Hygiene Training for Faculty, Principal Investigators, and Staff

Chemical hygiene training for faculty, principal investigators, and staff will include, as a minimum:

- The contents of the University Chemical Hygiene Program
- The contents of the college's Chemical Hygiene Program
- Personal responsibilities with regard to providing a safe and healthful environment



- The contents of CCR, T8, Section 5191
- Where and how to access of Chemical Hygiene Program documents
- The exposure limits for the Cal/OSHA regulated substances and/or recommended exposure limits for other hazardous chemicals where there is no applicable Cal/OHSA regulation specific to chemicals and substances with which they will work
- The signs and symptoms associated with exposure to the hazardous chemicals used in their laboratories, classrooms, stockrooms, and waste storage areas
- The location and availability of known reference materials on the hazards, safe handling, storage, and proper disposal of hazardous chemicals found in their laboratories, including, but not limited to SDS received from chemical suppliers
- The physical and health hazards associated with the chemicals and substances in use in their classrooms, laboratories, stockrooms, and waste storage areas
- The measures they can use to protect themselves from identified hazards, including, but not limited to, standard operating procedures; safe work practices; engineering controls (and how to use those controls); emergency procedures; as well as the purpose, limitations, use and care of PPE
- The methods and observations used to effectively detect the presence or release of a hazardous chemical or substance, including but not limited to:
 - Any formal monitoring conducted
 - Use of continuous monitoring devices, and
 - The visual appearance or odor of hazardous chemicals when being released

Additional safety and health training shall be provided regarding associated environmental health and safety compliance programs as specified within those compliance programs.

9.3.2. Chemical Hygiene Training for Students

Students shall receive environmental health and safety training from faculty regarding standard operating procedures for the use of hazardous chemicals, substances, and operations; safe work practices; basic chemical hygiene program compliance; and other associated environmental health and safety topics.

9.3.3. Training Documentation

All training will be documented in writing, including the date of training, summary of the training content, name of the trainer, and identification of attendees. Training records will be retained for at least four years.

Each college Chemical Hygiene Officer will be responsible for:

- Maintaining training documentation for the training conducted for his or her Dean, faculty, principal investigators, and staff
- Providing quarterly training status report to the University Chemical Hygiene Officer



The University Chemical Hygiene Officer will include a training status summary via a quarterly Chemical Hygiene Program status report that the University Chemical Hygiene Officer provides to the Director, Environmental Health and Safety.

Faculty members are responsible for maintaining training documentation for students and providing a summary report to their college's Chemical Hygiene Officer within the first 21 days of each semester.

10.0 Record Keeping

Each college's Chemical Hygiene Officer is responsible for maintaining the records that document the steps taken to comply with the College and University Chemical Hygiene Programs. The University's Chemical Hygiene Officer will monitor the maintenance of those records.

Each organizational unit is responsible for maintaining its records and the reports it receives. Records will be stored in a secure location and will be accessible, on demand, to ensure the information is immediately available to the Dean and the University Chemical Hygiene Officer.

Records will be maintained in accordance with the following table:

Document	Minimum Length of Retention
Safety Inspections	Four years
Employee Training	Four years
Enrolled Student Training	Four years
Program Status Report	Four years
Environmental Monitoring	Length of employee of monitored employees plus 30 years
Employee Medical Reports	According to California State University Policy
Incident Investigation	According to California State University Policy

11.0 Annual Chemical Hygiene Program Review

The University Chemical Hygiene Officer will ensure an annual review of the University's Chemical Hygiene Program is conducted and will monitor the completion of the annual review of College Chemical Hygiene Programs. The University Chemical Hygiene Officer will submit a summary report describing the Chemical Hygiene Program, and reviewing any findings and significant changes to the Director, Environmental Health and Safety. The University Chemical Hygiene Officer will monitor the completion of refresher training for faculty and staff when content changes are made to the Chemical Hygiene Program, its procedures, and its associated documents.

12.0 Appendices

- A - College Chemical Hygiene Program Outline
- B - Instructions for Completing Standard Operating Procedures
- C - Definitions

Appendix A - College Chemical Hygiene Program Outline

Each college's Chemical Hygiene Officer will develop a College Chemical Hygiene Program that is consistent with the University's Chemical Hygiene Program and follows the program outline listed within this appendix. If the Dean and/or College Chemical Hygiene Officer deem it necessary or appropriate to develop department Chemical Hygiene Programs, the college's Chemical Hygiene Officer will develop the department specific Chemical Hygiene Program, ensuring such programs are consistent with the University and College Chemical Hygiene Programs.

The College Chemical Hygiene Officer will provide a copy of the College Chemical Hygiene Program to the University Chemical Hygiene Officer for review and approval.

Chemical Hygiene Program Outline

1) Purpose

2) Responsibilities – specify the responsibilities of personnel responsible for and/or affected by the Chemical Hygiene Program

3) Criteria for Implementation of Control Measures

- a) Hazard Identification Methods – describe the identification methods that will be used and how they will be managed – expanded upon the list contained in the University's Chemical Hygiene Program if necessary
- b) Exposure Limits – reference the exposure limit standard(s) for the hazardous chemicals and substances used
- c) Exposure Control Measures - be specific as to:
 - i) What control measures will be used
 - ii) How the control measures will be obtained or implemented
 - iii) How the control measures will be inspected and maintained

4) Management of Engineering Controls

- a) Provide a list of engineering controls in use and identify their locations
- b) For each category of engineering control describe:
 - i) Who provides/obtains the engineering control
 - ii) How employees can obtain an engineering control when needed
 - iii) How employees can report the malfunction of an engineering control
 - iv) How each engineering control will be inspected and serviced, including the timing, documentation of the activity, and who is responsible

5) Standard Operating Procedures for Laboratories

- a) Describe the process for developing the standard operating procedures
- b) Describe the standard operating procedures specific to the college's laboratories, as well as the hazardous chemicals and substances used or stored
- c) Include standard operating procedures for both routine and non-routine procedures.
- d) Include emergency response procedures

6) Particularly Hazardous Procedures

- a) Describe how chemicals and substances will be classified as particularly hazardous
- b) Describe how procedures will be classified as particularly hazardous



- c) Describe the process of obtaining pre-approval for particularly hazardous chemicals and substances and/or procedures

7) Emergency Response to Chemical Spills, Releases, and Incidents

- a) Describe specific emergency response procedures for each hazard category
- b) Describe emergency response procedures for spills of hazardous chemicals and substances
- c) Describe emergency response procedures for exposure to hazardous chemicals and substances

8) Medical Consultation and Examinations

- a) Describe how employees will be provided with medical consultation and examination
- b) Describe how an employee can initiate a medical consultation or examination

9) Information and Training

- a) Information
 - i) Describe the information that will be provided and who will provide it
 - ii) College's Chemical Hygiene Committee describe:
 - (1) How members for the Committee will be solicited and selected
 - (2) The term of office for the Committee members
 - (3) When and where the Committee will meet
 - (4) Who will post the agendas and minutes
 - (5) How often the representative to the University Chemical Hygiene Committee will be elected
- b) Training
 - i) Describe how the new employee chemical hygiene training will be conducted
 - ii) Describe how routine safety and health training will be provided
 - iii) Describe how the students will be trained in regard to the Chemical Hygiene Program and the standard operating procedures
 - iv) Describe how the training will be documented
 - v) Describe how the training information will be collected for inclusion in the college's Chemical Hygiene Program status report

10) Record Keeping

- a) Describe the record-keeping process
 - i) Who is responsible for maintaining the reports and submitting status reports
 - ii) Where the training records will be maintained
 - iii) How long the records will be maintained

11) Annual Chemical Hygiene Program Review

- a) Describe the process for including faculty, principal investigators, staff, the Chemical Hygiene Officer, and the Dean in the review process of the college's Chemical Hygiene Program inclusive of standard operating procedures
- b) Describe how and when the program status, inclusive of proposed changes, will be submitted to the University Chemical Hygiene Officer
- c) How and when training in regard to program changes will be provided to faculty, principal investigators, staff, the Chemical Hygiene Officer, and the Dean

12) Appendices

- a) Standard Operating Procedures
- b) Definitions

Appendix B – Standard Operating Procedures Outline

INSTRUCTIONS FOR COMPLETING STANDARD OPERATING PROCEDURES

Each college's Chemical Hygiene Program shall include standard operating procedures (SOP) for the hazardous chemical, hazardous substance, and hazardous operations used in the college. Faculty, principal investigators, and staff managers should work with their college's Chemical Hygiene Committee, Chemical Hygiene Officer, the University Chemical Hygiene Officer, and the Safety and Risk Management Department in the development of SOPs.

Below are instructions for completing laboratory specific SOPs with the corresponding template. Please contact your designated Chemical Hygiene Officer with any questions or comments you may have while completing your SOPs. Completed SOPs are reviewed by the College Chemical Hygiene Officer.

1. Type of SOP

Specify the type of SOP at the top of the document. There are three types of SOPs:

- **Process:** the SOP will be for a process such as distillation, synthesis, etc.
- **Hazardous chemical:** the SOP will be for an individual chemical such as arsenic, formaldehyde, nitric acid, etc.
- **Hazard class:** the SOP will be for a hazard class of chemicals such as oxidizer, flammable, corrosive, etc.

2. Describe the Process, Hazardous Chemical, or Hazard Class

- **Process:** Briefly describe the process and name all the hazardous chemicals or substances used in the process
- **Hazardous chemical:** Provide the name of the chemical. Include the chemical abstract service number, the full name, the common name, and any abbreviations used for the chemical.
- **Hazard class:** Name the hazard class and list the names of the chemicals in this hazard class used or stored in your laboratory

3. Potential Hazards

In this section, describe:

- All the potential for both health and physical hazards for each process, hazardous chemical, or hazard class
 - For health hazards include:
 - Acute toxicity (any route of exposure)
 - Skin corrosion or irritation
 - Serious eye damage or eye irritation
 - Respiratory or skin sensitization
 - Germ cell mutagenicity
 - Carcinogenicity
 - Reproductive toxicity
 - Specific target organ toxicity (single or repeated exposure)
 - Aspiration hazard
 - The criteria for determining whether a chemical is classified as a health hazard are detailed in Appendix A of the Hazard Communication Standard (Section 5194) and Section 5194(c) (definition of "simple asphyxiant").



- The potential for chronic and/or acute health hazard effects of the chemical(s).
- Physical hazards include:
 - Explosive
 - Flammable (gases, aerosols, liquids, or solids)
 - Combustible liquid
 - Oxidizer (liquid, solid, or gas)
 - Self-reactive
 - Pyrophoric (gas, liquid or solid)
 - Self-heating
 - Organic peroxide
 - Corrosive to metal
 - Gas under pressure
 - In contact with water emits flammable gas
 - Water-reactive
 - Combustible dust
 - The criteria for determining whether a chemical is classified as a physical hazard are in Appendix B of the Hazard Communication Standard (Section 5194) and Section 5194(c) (definitions of “combustible dust,” “combustible liquid,” “water-reactive” and “pyrophoric gas”).
 - Radioactivity
 - Cryogenic
 - High temperature reactions
 - Electrical
 - UV light
 - Ionizing radiation
 - Laser
 - Unstable

4. Circumstances Requiring Prior Approval for Particularly Hazardous Chemicals or Processes

Discuss the circumstances under which this particular process, hazardous chemical, or hazard class will require prior approval (if any) from the Dean, principal investigator/laboratory coordinator, or Chemical Hygiene Officer. Consideration will be given to the following list of provisions when the special procedures are developed:

- Establishment of a designated area for the use of the high hazard chemicals and substances.
- Signage and access control to the work area where the chemical or substance is used.
- Special precautions, such as use of glove boxes or other containment devices.
- Enclosure or isolation of contaminated equipment.
- Practicing good laboratory hygiene.
- Safe transportation of very toxic chemicals and substances.
- Planning for accidental releases and spills.
- Special storage and waste disposal practices.

Some examples of circumstances that may require prior approval include unattended or overnight operations, use of explosives or pyrophorics, use of highly toxic gas in any amount, use of large quantities of toxic or corrosive gases or use of carcinogens.

5. Personal Protective Equipment (PPE)

Identify the required PPE for the process, hazardous chemical, or hazard class. PPE includes, but is not limited to, gloves, aprons, laboratory coats, safety glasses, chemical splash goggles, masks, respirators, face shields, and lead aprons.

6. Engineering Controls

Describe or list the engineering controls that will be used to prevent or reduce employee exposure to hazards. Examples of engineering controls include, but are not limited to, fume hoods, target fume extractors, glove boxes, interlocks on equipment, and shielding devices.

7. Special Handling and Storage Requirements

- Describe the handling and storage requirements for hazardous substances including, but not limited to:
 - special containment devices
 - special temperature requirements
 - special storage areas or cabinets
 - chemical compatibility storage requirements
- State the policy regarding access to the substance(s).
- Provide the exact storage location in the laboratory.
- Describe any special procedures, such as:
 - dating chemicals on receipt
 - opening
 - disposal
 - testing after an appropriate amount of time has passed
 - safe methods of transport, such as:
 - in a secondary container
 - low, stable cart
 - using two hands to carry the chemical container

8. Spill and Accident Procedures

Describe special procedures for spills, releases, and/or exposures. Indicate how spills, accidental releases and exposures will be handled. List the location of the following emergency equipment, including but not limited to:

- chemical spill clean-up kit
- first aid kit
- emergency eyewash and deluge shower
- fire blanket
- fire extinguisher

9. Decontamination Procedures

Describe specific decontamination procedures for contaminated equipment, glassware, and/or work areas.

10. Waste Disposal Procedures

Describe:

- the anticipated waste and byproducts
- how and where the waste will be collected
- how and when the waste will be disposed

11. Designated Area

Indicate the designated area established for experiments using particularly hazardous substances and/or procedures will be conducted. Be specific, such as a portion of a laboratory bench, a piece of equipment, the fume hood, or the entire laboratory.

12. Safety Data Sheet (MSDS) Location

Describe where:

- SDSs for the chemicals and hazardous substances are kept.
- Where other pertinent safety reference materials and information are located.

13. Protocols

Insert a copy of, or describe in detail, your specific laboratory procedures for the process, hazardous chemical, or hazard class.

SOP TEMPLATE

Standard Operating Procedures

Department: _____

Date: _____

Principal Investigator: _____

Chemical Hygiene Officer: _____

Laboratory Phone: _____ Office Phone: _____

Emergency Contact: _____
(Name and Phone Number)

Location(s) covered by this SOP: _____
(Building/Room Number)

1. Type of SOP (check one)

Process Hazardous Chemical Hazard Class

2. Describe Process, Hazardous Chemical or Class:

3. Potential Hazards:

4. Circumstances Requiring Prior Approval:

5. PPE:

6. Engineering Controls:

7. Special Handling & Storage Requirements:

8. Spill & Accident Procedures:

9. Decontamination Procedures:

10. Waste Disposal Procedures:

11. Designated Area:

12. SDS (MSDS) Location:



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13. Protocol(s):

Appendix C – Definitions

The following definitions include those definitions contained in California Code of Regulations, Title 8 (CCR,T8) Section 5191(b)

Action level - A concentration designated in Title 8, California Code of Regulations for a specific substance, calculated as an eight (8)-hour time weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance.

Biohazard agent - A replication capable pathogen that is a disease causing microorganism and is capable of causing diseases in humans including viruses, microbes and sub viral agents. The agent includes the agent, products of infectious agents, or the components of infectious agents presenting a risk of illness or injury.

Biohazardous materials - Any materials that would harbor biohazardous agents, such as human blood, body fluids, or tissues and that may be contaminated with biohazardous agents.

Biological safety cabinet - A ventilated cabinet that serves as a primary containment device for operations involving biohazard agents or biohazardous materials. Three classes of biological safety cabinets are described below:

Class I Biological safety cabinet - An open-fronted, negative pressure, ventilated biological safety cabinet. Exhaust air from the cabinet is filtered by a high efficiency particulate air (HEPA) filter and discharged without internal recirculation. This cabinet may be used in three operational modes; with a full width open front, with an installed front closure panel not equipped with gloves, and with an installed front closure panel equipped with arm-length protective gloves.

Class II Biological safety cabinet – A vertical laminar flow, open fronted, ventilated biological safety cabinet. Exhaust air is filtered with a high efficiency particulate air filter (HEPA). This cabinet provides HEPA-filtered downward air flow within the workspace. Class II biological safety cabinets are further classified as type A, type B1, type B2, and type B3. Class II type A cabinets may have positive pressure contaminated internal ducts and may exhaust HEPA filtered air into the laboratory. Class II type B1 cabinets have all biologically contaminated internal ducts or plenums under negative pressure or surrounded by negative pressure ducts or plenums, exhaust HEPA filtered air through external ducts to space outside the laboratory, and have HEPA filtered downflow air composed largely of unrecirculated inflow air. Class II type B2 cabinets (also known as "total exhaust" cabinets) have all biologically contaminated internal ducts or plenums under negative pressure or surrounded by negative pressure ducts or plenums, exhaust HEPA filtered air through external ducts to space outside the laboratory, and have HEPA filtered downflow air drawn from the laboratory or outside air. Class II type B3 cabinets (also known as "convertible" cabinets) have all biologically contaminated internal ducts or plenums under negative pressure or surrounded by negative pressure ducts or plenums, exhaust HEPA filtered air through external ducts to space outside the laboratory, and have HEPA filtered downflow air that is a portion of the mixed downflow and inflow air from a common exhaust plenum.

NOTE: Design, construction, and performance standards are available from the NSF International (the National Sanitation Foundation), Ann Arbor, Michigan. That standard is

the “National Sanitation Foundation Standard 49 Class II (Laminar Flow) Biohazard Cabinetry”.

Class III Biological safety cabinet - A totally enclosed, negative pressure, ventilated biological safety cabinet of gas-tight construction. Operations within the Class III cabinet are conducted through attached protective gloves. Supply air is drawn into the cabinet through high efficiency particulate air filters. Exhaust air is filtered by two high efficiency particulate air filters placed in series or by high efficiency particulate air filtration and incineration, and discharged to the outdoor environment without re-circulation.

Carcinogen - (see “select carcinogen”)

Competent Person - A person who is trained, knowledgeable, and capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to personnel and who has the authority to impose prompt corrective measures to eliminate these hazards.

Chemical Hygiene Officer - An employee who is designated by the employer and who is qualified by training or experience to provide technical guidance in the development and implementation of the provisions of the Chemical Hygiene Plan. This definition is not intended to place limitations on the position description or job classification that the designated individual shall hold within the employer's organizational structure.

University Chemical Hygiene Officer – Chemical Hygiene Officer responsible for oversight of the University’s Chemical Hygiene Program.

College Chemical Hygiene Officer – Chemical Hygiene Officer responsible for the oversight of a specific college of the University.

Chemical Hygiene Program - A written program developed and implemented by the employer that sets forth procedures, equipment, PPE, and work practices that:

- (1) are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular work place and
- (2) meet the requirements of subsection 5191(e).

Chief - The Chief of the California Division of Occupational Safety and Health

Combustible liquid - Any liquid having a flashpoint at or above 100°F (37.8°C) but below 200°F (93.3°C) except any mixture having components with flashpoints of 200°F (93.3°C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

Designated area - An area that may be used for work with “select carcinogens,” reproductive toxins, or substances that have a high degree of acute toxicity. A designated area may be the entire laboratory, an area of a laboratory, or a device such as a laboratory hood.

Emergency - Any occurrence such as but not limited to equipment failure, rupture of containers, or failure of control equipment that results in an uncontrolled release of a hazardous chemical into the workplace.

Employee - An individual employed in a laboratory workplace who may be exposed to hazardous chemicals in the course of his or her assignments.

Explosive - A chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

Flammable - A chemical that falls into one of the following categories:

- (1) "Aerosol, flammable" means an aerosol that when tested by the method described in 16 CFR 1500.45 yields a flame projection exceeding 18 inches at full valve opening or a flashback (a flame extending back to the valve) at any degree of valve opening;
- (2) "Gas, flammable" means:
 - (A) A gas that at ambient temperature and pressure forms a flammable mixture with air at a concentration of 13 percent by volume or less; or
 - (B) A gas that at ambient temperature and pressure forms a range of flammable mixtures with air greater than 12 percent by volume, regardless of the lower explosive limit.
- (3) "Liquid, flammable" means any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up 99 percent or more of the total volume of the mixture.
- (4) "Solid, flammable" means a solid, other than a blasting agent or explosive as defined in 29 CFR 1910.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

Flashpoint - The minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

- (1) Tagliabue Closed Tester (See American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24 - 1979 (ASTM D 56-79) - for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100°F (37.8°C), or that do not contain suspended solids, and do not have a tendency to form a surface film under test; or
- (2) Pensky-Martens Closed Tester (see American National Standard Method of Test for Flash Point by Pensky-Martens closed tester), Z11.7 - 1979 (ASTM D 93-79) for liquids with a viscosity equal to or greater than 45 SUS at 100°F (37.8°C), or that contain suspended solids, or that have a tendency to form a surface film under test; or
- (3) Setaflash Closed Tester (see American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTM D 3278-78)). Organic peroxides, which undergo autoaccelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above.

Hazardous chemical - Any chemical that is classified as a health hazard or simple asphyxiant in accordance with the Hazard Communication Standard (CCR, T8, Section 5194).

Hazardous Substance – A substance that by reason of being explosive, flammable, poisonous, an irritant, or otherwise harmful is likely to cause injury or illness if not used with effective control methods.

Health hazard - A chemical that is classified as posing one of the following hazardous effects: Acute toxicity (any route of exposure); skin corrosion or irritation; serious eye damage or eye irritation; respiratory or skin sensitization; germ cell mutagenicity; carcinogenicity; reproductive

toxicity; specific target organ toxicity (single or repeated exposure); aspiration hazard. The criteria for determining whether a chemical is classified as a health hazard are detailed in Appendix A of the Hazard Communication Standard (Section 5194) and Section 5194(c) (definition of “simple asphyxiant”).

HEPA – Acronym for high-efficiency particulate absorption.

Laboratory - A facility where the “laboratory use of hazardous chemicals” occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.

Laboratory scale –

- (1) Work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person. “Laboratory scale” excludes those workplaces whose function is to produce commercial quantities of materials.
- (2) Device used for determining the weight or mass of an object.

Laboratory-type hood - A device located in a laboratory, enclosed on five sides with a movable sash or fixed partial enclosure on the remaining side; constructed and maintained to draw air from the laboratory and to prevent or minimize the escape of air contaminants into the laboratory; and allows chemical manipulations to be conducted in the enclosure without insertion of any portion of the employee's body other than hands and arms.

Walk-in hoods with adjustable sashes meet the above definition provided that the sashes are adjusted during use so that the airflow and the exhaust of air contaminants are not compromised and employees do not work inside the enclosure during the release of airborne hazardous chemicals.

Laboratory use of hazardous chemicals - Handling or use of such chemicals in which all of the following conditions are met:

- (1) Chemical manipulations are carried out on a “laboratory scale”;
- (2) Multiple chemical procedures or chemicals are used;
- (3) The procedures involved are not part of a production process, nor in any way simulate a production process; and
- (4) “Protective laboratory practices and equipment” are available and in common use industry-wide to minimize the potential for employee exposure to hazardous chemicals.

Medical consultation - A consultation that takes place between an employee and a licensed physician for the purpose of determining what medical examinations or procedures, if any, are appropriate in cases where a significant exposure to a hazardous chemical may have taken place.

Mutagen - Chemicals that cause permanent changes in the amount or structure of the genetic material in a cell. Chemicals classified as mutagens in accordance with the Hazard Communication Standard (Section 5194) shall be considered mutagens for purposes of this section.

Physical hazard - A chemical that is classified as posing one of the following hazardous effects: Explosive; flammable (gases, aerosols, liquids, or solids); combustible liquid; oxidizer (liquid, solid, or gas); self-reactive; pyrophoric (gas, liquid or solid); self-heating; organic

peroxide; corrosive to metal; gas under pressure; in contact with water emits flammable gas; water-reactive; or combustible dust. The criteria for determining whether a chemical is classified as a physical hazard are in Appendix B of the Hazard Communication Standard (Section 5194) and Section 5194(c) (definitions of “combustible dust,” “combustible liquid,” “water-reactive” and “pyrophoric gas”).

Protective laboratory practices and equipment - Those laboratory procedures, practices, and equipment accepted by laboratory health and safety experts as effective or that the employer can show to be effective, in minimizing the potential for employee exposure to hazardous chemicals.

Reproductive toxins - Chemicals that affect the reproductive capabilities including chromosomal damage (mutations), effects on fetuses (teratogenesis), adverse effects on sexual function and fertility in adult males and females, as well as adverse effects on the development of the offspring. Chemicals classified as reproductive toxins in accordance with the Hazard Communication Standard (Section 5194) shall be considered reproductive toxins for purposes of this section.

Select carcinogen - Any substance that meets one of the following criteria:

- (1) It is regulated by Cal/OSHA as a carcinogen; or
- (2) It is listed under the category, “known to be carcinogens,” in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (1985 edition); or
- (3) It is listed under Group 1 (“carcinogenic to humans”) by the International Agency for Research on Cancer Monographs (IARC) (Volumes 1-48 and Supplements 1-8); or
- (4) It is listed in either Group 2A or 2B by IARC or under the category, “reasonably anticipated to be carcinogens” by NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria:
 - (A) After inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m³;
 - (B) After repeated skin application of less than 300 mg/kg of body weight per week;
or
 - (C) After oral dosages of less than 50 mg/kg of body weight per day.