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PREFACE

The University's most important resources are the faculty, staff, and students who live and work within the University's facilities. Over twenty thousand individuals are involved in research, administrative and educational activities here. Many may work with hazardous materials as part of their job. Others perform work in environments where serious injuries or possible exposures to dangerous substances could occur. Chemicals, radioactive isotopes, bihazardous agents, and energized equipment are routinely used in research and educational endeavors. All personnel working and learning in such environments must be well informed about hazardous materials to which they may be potentially exposed; learn to recognize and correct unsafe physical conditions and to understand correct methods of personal protection to be incorporated into their activities.

The University of Hawaii has a fundamental obligation to safeguard the health, safety and welfare of its students, personnel, and the visiting public whenever they participate in an official University activity. It is the policy of the University to provide and maintain, through implementation of safety and health programs, conditions and practices that provide safe and healthful campus environments. In keeping with this commitment, this Departmental Health and Safety Guide was developed.

The responsibility to implement health and safety programs lies at the departmental level where there exists the greatest control of facilities and personnel. This guide has been developed to provide all Deans, Directors and Department Chairs with an overview of campus resources, regulatory requirements and recommended safe work practices which must be integrated into an effective departmental safety program.

Peter Engleit
Chancellor, University of Hawaii at Manoa
January 2003
INTRODUCTION

Our office is fully committed to providing a healthy and safe environment for everyone and has adopted the theme "Hoʻoponopono Laulima" which means "Managing Safety Through Cooperation." It is our hope that the development of this publication will serve as a means of improving communication and cooperation among all members of the University. We believe that departmental support is essential in implementing the University's health and safety policy.

This guide is divided into a number of areas which include policy statements, personnel rights/responsibilities, hazard assessment guidelines and implementation procedures, employee training/education and a reference list of available resources. It is the goal of this publication to integrate health and safety information into a format easily understood and managed by departmental personnel who may have limited knowledge in occupational safety. Any questions concerning this publication should be directed to EHSO for clarification. Any comments or suggestions are encouraged and welcomed by our office.

This manual applies to general work environments and not specific worksites such as laboratories, maintenance shops, animal care facilities, and marine facilities. These specific worksites should have their own safety procedures or manuals, such as the Chemical Hygiene Plan (CHP) for laboratories. Additional departmental procedures may be added to this guide to address specific departmental workplace hazards, e.g. asbestos handling procedures, respiratory protection, hearing conservation, etc.

We hope that this guide will serve as a basis for your department's health and safety program. Please feel free to call us for further information or assistance.

Roy Takokawa, Director
Environmental Health & Safety Office
University of Hawaii at Manoa
POLICY

The University of Hawaii has a fundamental obligation to safeguard the health, safety, and welfare of its students, personnel, and visiting public whenever they participate in an official University activity. It is the policy of the University to provide for and maintain, through implementation of safety and health programs, conditions and practices that will provide safe and healthful campus environments. It is also the responsibility of each individual to comply with established health and safety regulations and procedures and to take every precaution necessary to prevent injury to themselves and to others. This policy is included in the University of Hawaii Systemwide Administrative Procedures Manual, A9.750 University of Hawaii Health and Safety Program.
RESPONSIBILITIES

A. DEANS, DIRECTORS AND DEPARTMENT CHAIRS

All Deans, Directors and Department Chairs are responsible for establishing and maintaining programs in their areas which will provide a safe and healthy work and living environment. The primary responsibility for establishing and maintaining a safe and healthy environment for its employees, students and visitors remains at the department level.

B. DEPARTMENTAL SAFETY COORDINATORS (if applicable)

Appointed by the Department Chair/Director, the Coordinator liaisons with EHSO and other service organizations to assist departmental personnel in developing and maintaining all facets of the program.

C. PRINCIPLE INVESTIGATORS/SUPERVISORS

All Principal Investigators and supervisors are responsible for compliance with this policy as it relates to operations under their control. Specific areas of responsibility include employee safety training, identification and elimination of hazardous conditions and recordkeeping.

D. EMPLOYEES AND STUDENTS

Each individual is responsible for following procedures and guidelines provided by their supervisor/instructor, as well as identifying hazardous conditions in the workplace. Moreover, each employee/student must attend training sessions and understand applicable safety requirements. Individuals are also responsible for asking questions of their supervisors when concerned about unknown or hazardous situations or substances.

E. ENVIRONMENTAL HEALTH AND SAFETY OFFICE (EHSO)

EHSO is responsible for monitoring compliance with this policy. In case of life safety matters or imminent danger to life or health, the Director of EHSO or his/her designee has the authority to order the cessation of the activity until the hazardous condition is abated or adequate measures are taken to minimize exposure to campus personnel from such a condition.
F. WORKPLACE SAFETY COMMITTEE (WSC)

The charge of the committee are as follows:

1. Establish policies that will ensure that the University of Hawai‘i is in compliance with all federal, state, and local regulations, statutes, procedures, and principles relating to environmental and occupational safety, including in particular (1) fire code, (2) the electrical code, and (3) the regulations relating to the purchase, storage, use, and disposal of hazardous chemicals. This task includes the review and maintenance of the UH Chemical Hygiene Plan (CHP).

2. Establish close-out procedures for hazardous chemical users that will minimize the hazardous waste burden to UH.

3. Review laboratory safety audit reports. In case where problems have been noted by EHSO, initiate corrective actions if the problems have not been resolved within reasonable amount of time.

4. Evaluate and approve the use of particular hazardous substances such as select carcinogens, reproductive toxins, and highly acute toxins. Prepare a list of such substances to facilitate oversight and control/regulation of their use.

5. The EHSO will evaluate laboratory accidents and chemical spills and will ask the WSC to initiate corrective action if needed to prevent the recurrence of such incidents.

6. In cases where correction of a workplace safety deficiency requires the expenditure of money, authorize, with the approval of the Chancellor, the funds needed to correct the problem.

7. Where necessary, intervene in EHSO inspection and enforcement actions (see Appendix 14).
GENERAL HEALTH AND SAFETY REQUIREMENTS

Hawaii Occupational Safety and Health Standards require that employers provide safe and healthful work places and practices by elimination or reduction of existing or potential hazards. Departments shall establish and maintain an occupational safety and health program which includes: a training program instructing employees of safe work practices and specific hazards unique to the employee's job; periodic inspections to identify unsafe conditions and work practices; and ways to correct them. All records of training and inspections shall be kept by the department.

A. POSTING OF NOTICE/EMERGENCY TELEPHONE NUMBERS/EMERGENCY PROCEDURES

1. Posting of Notice

Each department shall post and keep posted the orange and yellow poster "Safety and Health Protection on the Job" which informs employees of the following:

(a) protections and obligations under the law; and

(b) the availability of assistance and information; including copies of the law and of specific safety and health standards, from the department or EHSO Posting of notice shall be in accordance with Section 12-51-2, Title 12 of the HIOSH regulations.

2. Emergency Telephone Numbers

A poster shall be fastened and maintained, either on the first-aid kit or cabinet or near telephones giving the phone numbers and addresses of doctors, hospitals and ambulance services to be contacted in case of an emergency or the JABSOM Kakaʻako emergency security number shall be posted.

3. Emergency Procedures

Each University department/office should have a written emergency plan which would address the specific procedures for departmental personnel to follow in the event of various foreseeable emergency situations, i.e. fire,
medical problem, bomb threat, etc. This plan should provide for students, staff and members of the public and should be reviewed annually. The JABSOM Health & Safety Coordinator has written a guide which details the general overall response procedures for JABSOM Kaka'ako entitled, "Emergency Procedures Guide for University of Hawai'i, John A. Burns School of Medicine at Kaka'ako" and copies are available from the JABSOM Health & Safety Coordinator.

4. Evacuation and Notification Procedures

Should the building’s fire alarm be sounded or if you are instructed by emergency services (HFD, HPD, Security) to evacuate the building, these procedures will be followed:

1. Verbally notify others in the nearby area that there is a fire.
   - If the fire is small, you have been trained to use a fire extinguisher, and you have an unobstructed exit pathway, you may attempt to extinguish a small fire if you can do so safely.
   - **DO NOT** attempt to extinguish a fire if all three of the above criteria are not met and/or if you do not feel safe doing so.

2. Sound the building’s fire alarm at the nearest alarm pull station.

3. Evacuate the building using one of the emergency fire EXITs (to locate, follow the illuminated “EXIT” signs). **DO NOT** use the elevator or main lobby stairwell.
   - Assist any physically challenged people to the stairwell landing in an emergency fire exit.
   - Leave them at the stairwell landing so that trained personnel can return to move them safely.
   - Continue to evacuate the building.

4. Once outside of the building, proceed to the predetermined “Evacuation Gathering Areas”.

5. Call the Fire Department (911) if they have not been notified yet.

6. Notify emergency services (HFD or HPD) of any physically challenged people still in the building or if you believe that someone is missing.

7. **DO NOT** return to the building until the Honolulu Fire Department or Honolulu Police Department say you may go back in.
B. HAZARD COMMUNICATION

The term "hazardous" refers to any substance or material which could cause personal harm and injury to persons who may become exposed to the substances. Substances such as chemicals, radioactive isotopes, cleaning solvents, paints, inks, etc., are all potentially hazardous materials which are routinely used at JABSOM Kaka'ako. Of these various types, chemicals far exceed the others in total number and diversity. Chemicals are not only used by researchers in laboratories, but by our janitorial and trades people as well. Since the safe handling and use of chemicals is of primary concern, the Hazard Communication Program has been developed. This program introduces a set of procedures designed to minimize the risk of chemical exposure and to comply with the State of Hawaii Division of Occupational Safety and Health (HIOSH) Hazard Communication Standard (HazCom). The major components of our Hazard Communication Program are presented in this guide and the complete written program is provided in Appendix 7.

UH's Hazard Communication (HazCom) Program has two primary goals:

1. to clearly identify hazardous substances being used in the workplace and
2. to inform employees about the hazardous properties of those substances, as well as methods of personal protection that will ensure their well-being while handling the material while on the job.
The Hazard Communication Program includes the following information:

- Description of how labels, Material Safety Data Sheets (MSDS) and training are used to inform employees
- Description of the method the University uses to inform employees about the hazards of non-routine tasks and unlabeled pipes
- Description of how the University informs contractors of hazardous substances that they may encounter
- Standardized form for chemical inventories

1. **Hazardous Substance Identification and Inventory**

Each department is responsible for maintaining an inventory of all chemicals used in its operation. The inventory at a minimum shall include each chemical's name, manufacturer, and quantity. The inventory is to be updated at least annually, with obsolete items removed and new items added as necessary.

2. **Material Safety Data Sheets (MSDS)**

Manufacturers of chemicals are required by law to develop Material Safety Data Sheets (MSDS) for each of their products. An MSDS is a standardized document which contains sections on safety information including methods of personal protection, flammability, reactivity, special handling instructions, spill cleanup information, waste disposal requirements, etc. The information on each MSDS is standardized, however, there is no standardized MSDS form. Most manufacturers routinely include the MSDS with their product as it is shipped to the campus. Companies must also provide an MSDS for their products upon request.

Each department is responsible for maintaining copies of all MSDSs for their products. New or updated MSDSs received by the department should replace older documents.

3. **Employee Information and Training**

Each supervisor must provide training to their employees upon their assignment to a work area where hazardous substances are present. For details on the specific content of the training, refer to the University's HazCom Program. EHSO can also provide assistance to the departments for HazCom training.
4. Labeling

Primary labels affixed to manufacturer's original containers must be in good condition. Labels must state the manufacturer's name, address, identification of the substance, appropriate health warnings and physical hazards. All secondary containers into which hazardous substances are transferred must be adequately labeled with information which provides the chemical's name and appropriate hazard warning statement (i.e. "may cause lung damage if inhaled"). Secondary containers with small quantities of hazardous materials intended for use within one day need not have labels.

HAZARDOUS WASTE

The generation and disposal of hazardous waste at the JABSOM Kaka'ako is strictly regulated. Please contact the JABSOM Health and Safety Coordinator (692-1855) for any questions or concerns about hazardous waste. The EHSO Hazardous Materials Management Program ensures proper disposal of waste in accordance with federal and state rules and regulations. Hazardous waste includes flammable, explosive, poisonous and toxic chemicals. For radioactive waste questions or concerns, you may also call EHSO's Radiation Safety Officer (956-6475); for infectious and biohazardous waste questions or concerns you may also call EHSO's Biological Safety Officer (956-3197).

NON-HAZARDOUS WASTE

Non-hazardous waste is handled by a private janitorial company. The custodians will empty waste baskets containing regular trash. Glass is to be segregated from other non-hazardous trash. For disposal of other non-hazardous waste, refer to our waste disposal guidelines at our website (hawaii.edu/ehso/compliance/waste1.htm).

C. PERSONAL PROTECTIVE EQUIPMENT (PPE)

Requirements for personal protective equipment are found in Section 12-64.1-1, Title 12 of the HIOSH regulations. This standard covers protective equipment for eyes, face, head, hands and feet. The standard also includes provisions on electrical equipment.

Under the Personal Protective Equipment standard, there are two major requirements:
1. Hazard Assessment

Each department must assess the workplace to determine if hazards are present, or likely to be present, which necessitate the use of personal protective equipment (PPE). Please refer to Appendix 8 as a guide for assessing hazards.

If such hazards exist or potentially exist, the departmental supervisor shall select, and have each affected employee use the types of PPE that will protect against the identified hazards. PPE must properly fit each employee and the employee shall verify the assessment in writing.

2. Training Requirements

Each department must provide training to each employee required to use PPE. Training will include when PPE is needed, what PPE is needed, how to wear PPE, the proper care, maintenance, useful life and disposal of the PPE. The departmental supervisor has to certify in writing that the employee has received and understands the training.

D. WORK SITE INSPECTIONS

Section 12-60-1, Title 12 of the HIOSH regulations specifies that periodic inspections to identify unsafe conditions and work practices must be conducted for all departmental areas. The purpose of inspections is to identify and correct potential problems before employees become injured or property is damaged. Conducting inspections serves as one of the elements of a good accident prevention program which helps to maintain a greater safety awareness among all department personnel.

The JABSOM Health and Safety Coordinator and UH EHSO personnel conduct periodic inspections of labs, shops and administrative areas. Inspections can also be performed upon request. Please contact the JABSOM Health and Safety Coordinator (692-1855) if you would like to have your work area inspected. The inspection checklist forms in Appendix 9 were developed primarily for laboratories, but may be revised for offices and other settings.

Departmental inspections should be conducted at least annually. Problems noted in the inspections should be addressed immediately by supervisory personnel. The JABSOM Health and Safety Coordinator can be contacted for assistance in resolving problems.

E. WORKERS’ COMPENSATION
Supervisors are responsible for informing employees of their rights and responsibilities under the State of Hawaii's workers' compensation law. The designated departmental Workers' Compensation (WC) Coordinator shall provide advice and guidance to the supervisor, including providing copies of the "Highlights of the Hawaii Workers' Compensation Law" brochure and "What To Do For Work-Related Injury/Illness" information sheet.

Under the worker's compensation law, every work-related injury or illness resulting in the absence of one or more days and requiring medical services other than first-aid treatment must be reported by the Employer within seven days to the Department of Labor and Industrial Relations, Disability Compensation Division. The Employer for reporting purposes is the University's insurance carrier. Employees, supervisors, and WC Coordinators have a responsibility to timely report the work-related injury/illness of an employee to the University's insurance carrier. The UH Form 79 (OPHR), "Report of Work-Related Injury/Illness," is available for reporting purposes. Please refer to UH Administrative Procedure A9.720 Workers Compensation for further instructions on this matter.

Copies of completed UH Form 79 are received by EHSO (fax: 956-3205) where they are reviewed for injury trends that may occur within a department. If a trend is detected the EHSO conducts an investigation to determine the cause of injury/illness and ways to reduce or prevent the specific injury/illness.

F. ACCIDENT AND NEAR-MISS REPORTING/INVESTIGATION

An accident can be defined as "an undesirable event that results in harm to people, damage to property, or loss to process." This includes injuries, occupational disease, damage to University equipment, damage to property, environmental pollution, release of hazardous material or disruption to services. Anytime an accident occurs, that does not result in a workers' compensation claim, an Accident Injury and Illness Report should be completed by the JABSOM Health and Safety Coordinator and forwarded to EHSO for follow-up. A copy of the form is provided as Appendix 11.

Similarly, a near-miss is defined as "a situation where the sequence of events could have caused an accident if it had not been interrupted". In order to be proactive in preventing accidents, supervisors are responsible for reporting near-misses to the JABSOM Health and Safety Coordinator (956-7937).

A near-miss report form is provided in Appendix 11. Depending on the potential severity and the probability of a near-miss becoming an accident, EHSO staff will conduct investigations in order to identify the problem and implement corrective actions. It is important to understand that "employees being more careful" is not an acceptable corrective action to prevent recurrence of these incidents. When an accident of near-miss is experienced, a failure in a system or procedure has
occurred. Identifying the failure is the objective of the investigation that EHSO conducts.

G. RECORDKEEPING

All matters pertaining to employee/student health and safety concerns must be fully documented. Written records of activities, such as development of special departmental safety policies and procedures, training sessions for managers and employees, and minutes of safety meetings and so on, must be maintained at the appropriate level as specified in the following:

1. EHSO is responsible for:

   Documenting all training programs provided to departments by EHSO staff, including a participant list, date of presentation and topic discussed.

2. Department (JABSOM) Health and Safety Coordinator is responsible for:

   Maintaining records concerning employee injuries, incident reports, grievances involving safety matters, personnel exposure records, training, etc.

3. Supervisor is responsible for:

   Documenting any exchange of safety information with employees occurring through formal presentation and/or one-to-one meetings at the work site.

NOTE: Records of all safety matters are subject to periodic review by EHSO, HIOSH and other applicable agencies conducting workplace inspections. They should be maintained in a clearly identified, central file within the department for ease of access.
EMPLOYEE SAFETY TRAINING

Effective dissemination of safety information is essential in the success of a health and safety training program. Section 12-60-2, Title 12 requires the department to provide safety training for its employees in the following: "general safe work practices and specific instructions with respect to hazards unique to the employee's job assignment."

The purpose of providing safety training to employees is to help them clearly understand the risks of hazards they face on the job and to provide information concerning methods of personal protection which will safeguard them while performing those tasks.

EHSO provides training programs in many different areas, see Appendix 6. Most training program material is general in nature so as to be applicable to a great number of departments. Sessions can be scheduled through the JABSOM Health and Safety Coordinator (692-1855) for presentation to departmental employees/students as needed.

Specialized training sessions dealing with an employee's unique job assignment must be developed by his/her supervisor. It is the supervisor's responsibility to understand his/her employee's job tasks and its related hazards. HIOSH regulations are quite specific about responsibilities of supervisory personnel with respect to informing their employees about hazards they face on the job.

A long-range departmental training plan should be developed which sets priorities for training sessions, including a schedule of presentations. Consideration should also be given to frequency required for retraining purposes. These refresher programs should be incorporated into the long-range plan.

Complete documentation of all training activities must be maintained at the department. The record should show the participants printed name and signature, date of presentation, topic discussed, as well as an outline of the material presented. These records must be made available to HIOSH and other agencies during worksite inspections.
RESOURCES

The following resources are available to departments for assistance in the implementation of their health and safety program.

A. ON-CAMPUS (Manoa)

1. Environmental Health and Safety Office

The following presents an overview of the services available from EHSO:

Radiation Safety - The Radiation Safety Officer and health physics staff monitor the proper use of all radioactive materials used in research and instructional applications on campus.

Education & Training - A broad array of safety programs have been developed by EHSO's staff to assist supervisors in meeting their training obligations. Topics range from subjects on fire, laboratory and radiation safety to specialized sessions on asbestos, lead, noise, etc.

Workplace Safety - The Industrial Hygienist provides personal monitoring and environmental testing in work areas where toxic or hazardous substances are routinely used.

Fire Safety - The Fire Safety Officer ensures that all campus facilities conform to the applicable fire codes and that the campus is prepared for fires, explosions and other emergency situations in an informed manner.

Biological Safety - The Biological Safety Officer oversees the use of potentially hazardous biological organisms and recombinant DNA activities at all University facilities.

Hazardous Materials Management - Manages the campus waste minimization program. Chemical wastes are picked up by request, taken to a special waste handling facility and packaged for shipment to mainland disposal sites.

Chemical Safety/Toxicology - The Chemical Hygiene Officer provides information on safe handling and storage of reactive and
toxic substances; and makes recommendations regarding proper personal protection.

**Laboratory Safety** - EHSO personnel conduct periodic inspections of eyewash stations, safety showers and laboratory hoods. Problems connected with chemical storage, fire safety, electrical hazards, and personal protection are focused upon.

**Office Safety** - EHSO on request, may conduct inspections in offices to address common concerns such as poorly designed work areas, use of unsafe electrical devices, improper storage of office chemicals, inadequate ventilation and lighting, etc.

**Respiratory Protection** - The Industrial Hygienist coordinates the campus-wide program which provides proper fit-testing of approved respirators for all persons working in areas where exposures to harmful levels of dusts, mists, fumes or vapors occur.

**EHSO Publications** - Copies of the following reference publications are available from EHSO:

* UH Diving Safety Manual
* UH Radiation Safety Manual
* UH Hazard Communication Program
* UH Hearing Conservation Program
* UH Respiratory Protection Program
* UH Asbestos Management Plan
* UH Chemical Hygiene Plan
* UH Hazardous Materials Management Program

All EHSO services are available to department personnel by contacting EHSO during regular working hours.

2. **Office of Human Resources** - the Worker's Compensation (WC) Program for the University is administered by this office. A work related injury or illness of an employee must be timely reported by his/her departmental WC Coordinator to the University's insurance carrier with a copy to the UH Office of Human Resources. See UH Administrative Procedure A9.720 Workers' Compensation for further instructions on this matter.

3. **University Health Services** - physicians and nurses provide primary medical care for illness and injury for students. Student Health Services assists the student in obtaining other specialized medical services in the community. Health education and counseling are also provided.
4. Wellness Council - the primary functions of the council are:

(1) permit exchange of information among a widely representative body of individuals whose interests in wellness issues reflect the diversity of the Manoa campus;
(2) develop and implement plans for action for a campus wellness program;
(3) coordinate appropriate and relevant activities;
(4) recommend appointment and length of service of new and continuing members; and
(5) provide timely and informative reports to the Manoa Executive Council.

B. OFF CAMPUS

1. Hawaii Division of Occupational Safety and Health – This agency is divided into several branches, each of which provides different services:

a) Consultation Branch - provides free workplace inspections and written materials to businesses in an effort to help them understand and comply with the occupational safety codes for Hawaii. This division cannot, by law, issue any citation unless there is an immediately, life-threatening situation occurring. They are strictly an advisory group which can provide a wealth of information upon request.

b) Compliance Branch - acts as the enforcement arm of the agency. This group conducts unannounced inspections of work areas with the task of ensuring that workplaces are operating in conformance to applicable occupational safety and health standards. Problem areas found during a compliance inspection result in citations and fines being issued to the department with orders to have the problems corrected within a fixed time frame. Compliance investigations are conducted after serious accidents occur or in response to employee complaints.

c) Library/Video Catalog - The reference library makes available, free of charge to the public, 16mm films, slide/tape presentations and 1/2” VHS videocassettes.

2. Human Resources Department - provide assistance in safety, training and worker’s compensation for other state agencies. The Training Branch coordinates health and safety training for state employees. The Safety Branch responds to other state agencies' requests for assistance on safety related problems.

3. National Safety Council - a nonprofit organization dedicated to providing safety related information for work and home. Both members
and nonmembers of the Council may purchase training materials, posters, films, tapes, etc., which can be used to augment departmental efforts. Catalogs of materials are available upon request from the EHSO.

4. National Institute for Occupational Safety and Health (NIOSH)- a branch of the US Department of Health and Human Services which provides a diversity of educational materials concerning occupational safety topics. Catalog materials are available at a nominal cost.
APPENDIX 1

UNIVERSITY OF HAWAII
ENVIRONMENTAL HEALTH AND SAFETY OFFICE
DIRECTORY

I. EMERGENCY SERVICES

   A. Honolulu Fire Department/Honolulu Police Department  911
   B. JABSOM Kaka’ako Security  692-0911 or 692-1911

II. ENVIRONMENTAL HEALTH & SAFETY OFFICE

   A. JABSOM Health and Safety Coordinator  692-1855

   B. EHSO Director  956-8660
       Workplace Safety  956-3204
       Radiation Safety  956-6475
       Fire Safety  956-4953
       Laboratory Safety  956-5180
       Biological Safety  956-3197
       Diving Safety  956-9643
       Hazardous Material Management  956-3198
       Environmental Compliance  956-9173

III. FACILITIES PLANNING & MANAGEMENT OFFICE

   A. Work Coordination (regular hours)  692-0913

Note: EHSO telephone numbers are answered only during regular business hours. Contact JABSOM Kaka’ako Security (692-0911 or 692-1911) or Emergency Services (911) for 24-hour emergency assistance.
APPENDIX 2

FIRST AID KIT REQUIREMENTS

§12-62.1

Appendix A to 1910.151
First aid kits (Non-Mandatory)

First aid supplies are required to be readily available under paragraph §1910.151(b). An example of the minimal contents of a generic first aid kit is described in American National Standard (ANSI) Z308.1-1978 “Minimum Requirements for Industrial Unit-Type First-aid Kits.” The contents of the kit listed in the ANSI standard should be adequate for small worksites. When larger operations or multiple operations are being conducted at the same location, employers should determine the need for additional first aid kits at the worksite, additional types of first aid equipment and supplies and additional quantities and types of supplies and equipment in the first aid kits.

In a similar fashion, employers who have unique or changing first-aid needs in their workplace may need to enhance their first-aid kits. The employer can use the OSHA 200 log, OSHA 101’s or other reports to identify these unique problems. Consultation from the local fire/rescue department, appropriate medical professional, or local emergency room may be helpful to employers in these circumstances. By assessing the specific needs of their workplace, employers can ensure that reasonably anticipated supplies are available. Employers should assess the specific needs of their worksite periodically and augment the first aid kit appropriately.

If it is reasonably anticipated that employees will be exposed to blood or other potentially infectious materials while using first aid supplies, employers are required to provide appropriate personal protective equipment (PPE) in compliance with the provisions of the Occupational Exposure to Blood borne Pathogens standard, §1910.1030(d)(3) (56 FR 64175). This standard lists appropriate PPE for this type of exposure, such as gloves, gowns, face shields, masks, and eye protection.
APPENDIX 3

EXTENSION CORD USE GUIDELINES

EXTENSION CORDS SHOULD BE:

- For temporary use pending the installation of permanent outlets.
- For applications where equipment is not routinely used.
- For temporary or portable equipment.
- Energized from a permanent outlet.
- Grounded 3-wire type.

EXTENSION CORDS SHOULD NOT:

- Run through openings in walls, ceilings, or doorways.
- Be draped over light, ceiling, wall fixtures, etc.
- Be attached or fixed to any surface.
- Run across aisles or walkways.
- Run under carpets or flooring.

MULTI-OUTLET ASSEMBLIES SHOULD BE:

- Properly secured to a permanent surface.
- Equipped with fuse or circuit breaker.
- Energized from a permanent outlet.
- Grounded 3-wire type.
- UL approved.
APPENDIX 4

VIDEO DISPLAY TERMINAL (VDT) USE GUIDELINES

A number of questions have been raised regarding the impact of VDTs on employee health and the work environment. The purpose of this information sheet is to provide responses to many of these questions. It should be noted that these guidelines have been developed for personnel who use VDTs for extended periods of time each day. These recommendations do not apply to every situation in which VDT is used.

RADIATION

Many VDT operators have questions about their potential exposure to radiation. The Bureau of Radiological Health regulates the manufacturer of VDTs and conducts extensive studies to insure that terminals do not emit harmful levels of radiation. Further, the National Institute for Occupational Safety and Health (NIOSH) has measured radiation being emitted from machines now in use and has concluded:

"The radiation levels emitted by a VDT are very low compared to current occupational exposure standards. In many cases, the levels are below the detection capability of the survey instrumentation used. Based on the survey data, NIOSH concludes that VDTs do not emit radiation levels that present a hazard to employees working at or near the terminals."

Between 1982 and 1985 a pilot study was conducted at the East-West Center to determine radiation levels from VDTs. During the study, 165 new terminals and all terminals returned from repair were surveyed for x-ray and ultraviolet radiation. During the three-year study no measurable radiation emissions were found at any of the terminals. Extensive studies by a variety of other private and government agencies, including the National Academy of Sciences, have consistently demonstrated the absence of any radiation hazard associated with VDT use.

Since the pilot study, annual surveys have been conducted at East-West Center to determine radiation levels from VDTs. Ultraviolet (UV) and x-ray surveys performed yearly on over 300 VDTs showed levels of between 50 to 1000 times below the National Institute of Occupational Safety and Health (NIOSH) standards for UV and 50 times below for x-ray.
VISION

VDT operators may experience visual fatigue or "tired eyes" from VDT use. While there is no evidence of long term adverse visual effects resulting from VDT use, periodic eye examination are recommended for heavy users of VDTs. Factors contributing to visual fatigue include:

General
Displays should be selected with viewing in mind. For example, color and image size may be selected for individual preference. In addition, the "refresh" rate (ability of the machine to project and maintain the image on the screen) should be high.

Contrast
Contrast is the difference between screen and working environment illumination. While it has not been demonstrated that reduced contrast is responsible for inducing visual fatigue, it does increase reading time, thus slowing production.

Accommodation
The entire display should be sharp focus. A lack of sharpness of the characters on the display terminal continually forces the eyes to attempt to focus the image. If the image itself is blurred, the attempt to focus the image is futile. This continual accomodation may be a source of eye fatigue.

Glare
If glare (or a reflected image) is present on the display terminal, the eyes will attempt to focus on both the VDT image and the reflected image resulting in continued accommodation and potential visual fatigue. Glare may be eliminated by placement of an appropriate filter over the terminal screen, placing the screen at a ninety-degree angle to windows or other light sources, covering the windows, and/or the use of task lighting.

Copy Location
The copyholder should be placed between the keyboard and the screen or adjacent to the screen. The copyholder distance and tilt should be adjustable. This will minimize refocusing between the two surfaces.

MUSCULOSKELETAL

VDT operators often complain of various types of musculoskeletal discomfort. Most of the complaints relate to neck, shoulders, back, arms and hands. Uninterrupted VDT use may lead to specific muscle or muscle group fatigue. Musculoskeletal discomfort may be attributed to the following: the design of the work station, repetitiveness of the task, degree of postural constraints, work
pace, work/rest schedules, and personal attributes of individual workers. Each of these factors should be included in a review of the VDT working environment.

WORKSTATION DESIGN

The VDT station should be arranged to fit the physical characteristic of the individual worker. Where applicable, workers should be trained to adjust furniture, screen and keyboard. Listed below are some specific recommendations (see diagram for additional information):

The Monitor
- The top of the screen should be no higher than eye level.
- The monitor should stand at a 90-degree angle to any windows to reduce glare.
- The monitor should be in front of a neutral or non-shiny background.
- The screen should be 18-30 inches from the user's eyes, or at about arm's length.

The Keyboard
- At the keyboard, the user's upper arms should be perpendicular to the floor and the lower arms should be parallel to the floor.
- A pad or other support should be placed under the wrist, especially if the keyboard feels to high. If necessary, the keyboard can be raised by placing boards under it.
- The home row of a detachable keyboard should be centered in front of the monitor.

Seat Position
- One's chair should be adjustable so that the soles of the user's feet are flat on the floor, with 3-6 inches of legroom between the user's lap and desk or keyboard; and the knees bent at a 90-degree angle while sitting up straight.
- If the chair cannot be adjusted, the user can place a board or box under his feet.
- The chair should have good back support. The backrest should be adjustable so the lower back is fully supported.

The Desk
- The user should have free movement of the legs beneath the desk.
- The desk should be large enough to accommodate the keyboard and monitor without placing the monitor off to one side.
Work/Rest Schedule

- The user should avoid continuous keyboarding. A user who breaks up a four-hour typing job into four periods staggered throughout the workday is much less likely to suffer from fatigue than one who types for four hours straight. Every few minutes the user should look at something besides the monitor to refocus the eyes and get up and walk around whenever convenient.

- Among the guidelines suggested for reducing potential employee stress from continual VDT operating is the use of task rotation and/or rest breaks. Simply getting up and exercising the large muscles of the body by walking and stretching will relieve many of the physical discomforts associated with prolonged VDT use. Performing other job-related tasks that are less demanding on the eyes and body muscles will also help to lessen some of these effects. NIOSH has recommended that:

  ➔ A fifteen (15) minute work/rest should be taken after two hours of continuous VDT work for operators under moderate visual demands and/or moderate workload.

  ➔ A fifteen (15) minute work/rest break should be taken after one hour of continuous VDT work for operators under high visual demands of high workload and/or those engaged in repetitive work tasks.
The University of Hawai‘i-John A. Burns School of Medicine (JABSOM) at Kaka‘ako is a non-smoking campus. Smoking is not permitted anywhere on campus.
Biological Safety Training

1. Biological Safety (Initial-2 hours; Refresher-1 hour):

   For first time users. Introduction to procurement, transport, use and disposal of biological commodities. Includes basic microbiological practices, containment, and techniques; proper biological wastes management and import requirements. Annual refresher provides latest information on changes in biological safety requirements.

2. Biological Agents and Bloodborne Pathogen/Occupational Exposure to Tuberculosis (1-hour):

   Discussion on HIOSH Standards on exposure control and determination; methods of compliance, housekeeping, laboratory research uses, medical surveillance, exposure evaluation, post-exposure follow-up, hazard awareness and recordkeeping.

3. Proper Biological/Infectious Waste Management (1 hour):

   Discussion of the State Dept. of Health Rules and Regulations: Types of Biological and Infectious Waste; Handling, Storing, Treating and Disposing of Wastes; and Infectious Waste Management Plan.

4. Shipping and Receiving of Biological Commodities (Initial-3 hours; Refresher-1 hour):

   Trains shippers and receivers of biological commodities (infectious substance, diagnostic specimens, biological products, dry ice and cryogenic liquids) on the requirements according to Center for Disease Control (CDC); National Institute of Health (NIH); US Dept. of Agriculture; US Dept. of Transportation; International Association of Transport Association; and International Civil Aviation Organization. Includes, classifying, identifying, packaging, marking, labeling, documenting, handling and emergency response.
Recertification is required every 2 years and the training last for 1 hour.

**Fire Safety Program Training**

1. Fire Safety (60 minutes):

   Instruction includes chemistry, characteristics and behavior of fire; types of fire extinguisher and classes of fire; fire extinguisher ratings, reliability, design safety, identification, inspection, selection and use; fire extinguishers and extinguishing equipment common to the Manoa campus; proper procedures for reporting fires on campus and at home; and alarm, evacuation, and extinguishment safety procedures to be followed during an actual fire experience.

2. Fire Extinguisher Training (30 minutes):

   A practical demonstration of extinguisher use including hands on experience by class participants utilizing class "B" fire extinguisher on actual burnable liquid fires. This practical extinguisher training is a critical portion of the fire safety experience as it develops confidence in participants in their ability to actually assess, approach, attack and successfully extinguish fires in the incipient stage.

**Workplace Safety Training**

1. Asbestos Awareness Training (2 hours-initial/annual refresher):

   Inform employees on what is asbestos; location of asbestos containing material on campus; asbestos regulations and what needs to be done to prevent exposure.

2. Hazard Communication Training (1 hour):

   Inform workers about the standard; its purpose, requirements for labeling and material safety data sheet (MSDS).

3. Hearing Conservation Program Training (1 hour/annual):

   Inform workers on general requirements of the program; the effects of noise on hearing; the fit, use and care of hearing protectors; and the need for audiometric testing.

4. Respiratory Protection Training (1 hour/annual):
Inform workers on the general requirements of the respiratory program. The training provides information on the selection, use and maintenance of respiratory protection equipment. Workers are also fit-tested for respirators at this time.

5. Back Injury and Prevention (1/2 hour):

The training briefly covers the anatomy of the back; causes and symptoms of back injuries; proper lifting techniques and other techniques to prevent back injuries.

**Radiation Safety**

Radiation Safety Class (3 hours):

This class is a formal training course for radiation safety workers or for persons occupying a restricted laboratory area. Health physics, exposure limits and risk, University policies for safe use and handling of radioisotopes, waste disposal, procurement procedures, inventory records and survey techniques are covered during this course.

**Laboratory Safety Program Training**

Laboratory Safety (90 minutes):

Training includes elements of the written Chemical Hygiene Plan; safe lab practices; chemical use, storage and disposal; personal protective equipment; proper fume hood use; chemical spill clean-up procedures; and emergency preparedness.

**Hazardous Materials Management Training**

Hazardous Waste Generator (Initial-2.5 hours/annual-1.5 hours):

Federal and State regulations as well as the UH Hazardous Materials Management Program (HMMP) require that all generators of hazardous waste receive mandatory initial training and annual refresher training. The purpose of the training is to provide waste generators with EPA requirements and University hazardous materials/waste policies and procedures. EHSO will not accept a request for disposal of excess hazardous materials or hazardous waste unless the material/waste turn in form is signed by a generator that has attended the initial training, or a refresher training within the past year.
# APPENDIX 7

**UH HAZARD COMMUNICATION PROGRAM**

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APPENDICES
A. CRITERIA FOR EVALUATING HAZARDOUS MATERIALS
B. LISTING HAZARDOUS CHEMICALS
C. MINIMUM LIST OF HAZARDOUS CHEMICALS
D. EXPLANATION OF MATERIAL SAFETY DATA SHEET

EXHIBITS
1A. HAZARDOUS MATERIALS INVENTORY FORM/LIST
1B. OUTLINE FOR HAZARD COMMUNICATION TRAINING
1C. HAZARD COMMUNICATION TRAINING RECORD
1D. MATERIAL SAFETY DATA SHEET OSHA FORM 174
1.0 Introduction

The University of Hawaii is committed to providing a safe and healthful environment for all employees. Consistent with this commitment, we have developed a Hazard Communication Program.

One of our primary concerns is the safe handling and use of chemicals throughout the University to minimize or prevent potential exposure. Potential hazards in the environment include materials that cause fire or explosion or produce injury by inhalation, skin or eye contact, or ingestion. One of the benefits of this program is that workers will know the hazards of chemicals they are working with. This program introduces a set of procedures designed to minimize the risk of chemical exposure and keep us in compliance with the State of Hawaii Division of Occupational Safety and Health (HIOSH) Hazard Communication Standard (HazCom). In keeping with this program, the health of the worker is a primary concern.

The written HazCom program is provided to each department and includes the following:

→ Description of how labels, Material Safety Data Sheets and training are used to inform employees

→ Description of the method the University uses to inform employees about the hazards of non-routine tasks and unlabeled pipes

→ Description of how the University informs contractors of hazardous substances that they may encounter

→ Standardized form for chemical inventory listing to be followed by each supervisor

This written program is available for review by any interested employee, or representative of any employee. Any questions about this program should be addressed to the EHSO. This program is monitored and audited by the EHSO to ensure that the policies are carried out and that the program is effective.

2.0 Program Administration

Each supervisor shall be responsible for implementing the provisions of this program. All training required under the standard shall be provided at no cost to the employee.
The Industrial Hygienist from the UHM Environmental Health and Safety Office shall assist the departments with the implementation and maintenance of the HazCom Program.

3.0 An Overview of the Program

The HazCom Program consists of the following elements:

1. **Inventory of Hazardous Chemicals**
   
   An inventory of all hazardous chemicals used in each department is developed. The inventory is to be updated at least annually, with obsolete items removed and new items added as necessary.

2. **Material Safety Data Sheets (MSDS)**
   
   Each supervisor is responsible for obtaining, filing, updating and placing in appropriate work areas a Material Safety Data Sheet for each chemical on their inventory.

3. **Warning Labels on All Containers of Hazardous Materials**
   
   Each supervisor is to label all containers of chemicals with both the contents of the containers and hazard warnings.

4. **Hazard Communication Training**
   
   Each supervisor is responsible for training their employees on the elements of the HazCom Program.

4.0 Hazardous Substance Inventory

Each supervisor is responsible for maintaining an inventory of all chemicals used in its operation. Appendix A and B are provided as guides for determining which substances are considered hazardous.

The name on the inventory form should correspond to the product identity found on the label and MSDS. The hazardous materials inventory form provided in Exhibit 1A may be used by the department. The inventory list indicates if the substance has an appropriate label and if the MSDS is on site. In the future, if chemicals are received and/or discontinued, this inventory should be revised accordingly.
4.1 Updating the Inventory Lists

Inventories are to be kept current. Once a list has been compiled, it must be updated. The updating should take into account two changes:

→ Products that are no longer used (providing that on-hand stocks have been used up)
→ New products that have been added annually

5.0 Labels

5.1 Labeling Requirements

All containers of hazardous substances must be labeled to provide HazCom information. The manufacturer, distributor or importer is responsible for labeling their products prior to shipment to their customers. The label on original containers must provide the following information:

→ Identity of the hazardous substance(s)
→ Appropriate hazard warning(s)
→ Name and address of manufacturer

Correct labeling is verified upon receipt of any chemical material by the receiving department. If the receiving department has any questions as to the acceptability of a label, questions may be addressed to the ESHO.

5.2 Incomplete or Missing Labels

If a material is received with inadequate labeling, the department is responsible for notifying the supplier and acquiring an acceptable label. The supervisor is responsible for ensuring that chemicals in the work area are appropriately labeled.

5.3 Secondary Containers

Sometimes hazardous substances are transferred from original containers to secondary containers such as test tubes, vials, beakers, etc. The labels on secondary containers must include the identity of the hazardous substance(s) and appropriate hazard warnings.

For example:

→ Apply an extra copy of the manufacturer's label to the secondary container
→ Copy the chemical identity and hazard warning information from the manufacturer's labels onto a blank label, and affix it to the secondary container(s)
Containers must be labeled clearly with the appropriate information. The supervisor is responsible for verifying correct labeling of the secondary containers.

5.4 Use of Labels

Labels are intended to be an immediate warning and a reminder of the information provided by the MSDS and training program. The labels should be read before the chemicals are handled. If the precautions specified by the label are unfamiliar, employees are encouraged to consult the MSDS for further information or contact their supervisor or the EHSO.

6.0 Material Safety Data Sheet

6.1 Information Requirements

As with labels on original containers, MSDSs are prepared by the manufacturer, distributor or importer of products containing hazardous substances. The MSDSs provide detailed information about the product as listed below:

- Chemical composition
- Physical characteristics and chemical properties
- Fire, explosion and reactivity hazards
- Health hazard information and symptoms of overexposure
- Emergency first aid procedures
- Protective equipment recommendations
- Handling and storage precautions
- Cleanup and disposal procedures

We rely on the manufacturer, importer or distributor to evaluate the hazards of materials. Hazard evaluation information is provided on the MSDS. The HIOSH HazCom Standard requires all chemical manufacturers and distributors of hazardous chemicals to furnish a MSDS with each initial shipment to each location and furnish new MSDS information. Appendix D provides a sample MSDS along with the explanation of each section.

6.2 Location and Accessibility of Material Safety Data Sheets

Each supervisor is responsible for maintaining copies of all MSDSs for their products. Since employees in some departments are highly mobile, copies of MSDS may be available at a centralized location and must be readily available to employees during all hours of operation. MSDSs are also available to medical personnel; State and Federal occupational safety and health officials, and ESHO personnel. Employees are encouraged to refer to the MSDSs for information on products in their work area.
6.3 Obtaining Material Safety Data Sheets

For new materials or materials without a MSDS on file, the purchase order should include a statement requiring that a MSDS accompany shipment of hazardous materials. All MSDSs received by each department must be reviewed for completeness and included into the MSDS file by the supervisor. If a MSDS is not available in the department files, then the department must send a letter to the manufacturer.

A new material cannot be distributed or used until the department has received the MSDS and communicated the MSDS information to the employees.

6.4 Incomplete or Missing Material Safety Data Sheet

If the MSDS is missing or incomplete the department should send a letter to the manufacturer requesting one. If no response is received within twenty five (25) working days of the request, a copy of the request with a notation that no response has been received is sent to the State of Hawaii, HIOSH office. The department shall keep copies of all correspondence and request letters on file.

7.0 Training

7.1 Employee Training

Each supervisor provides employee training to their employees upon their assignment to a work area where hazardous substances are present. The information provided during this session includes the following:

- The requirements of the HazCom Standard, including all employee’s rights to information and non-discrimination
- An explanation of the MSDS and information it contains
- The location and availability of the written HazCom program and MSDSs
- How to read labels and how to use the information they contain
- Operations in the work area where hazardous substances are present
- The physical and health hazards of the chemicals in the work area
- Methods and observation techniques used to detect the presence or release of hazardous substances in the work area
Measures employees can take to protect themselves from and minimize exposure to hazardous substances

Emergency first aid procedures

A detailed outline of the HazCom training is provided in Exhibit 1C.

7.2 Refresher/On-going Training

When new hazardous substances are introduced and/or new hazard information becomes available on the materials used in the work area, the supervisor reviews with their employees the items outlined in Section 7.2 (as applicable). The supervisor contacts the EHSO if employees have questions they cannot answer.

7.3 Documentation

Each department must maintain a list of each employee who has completed HazCom training. This list, along with the training date and contents of the training is kept on file in the department and in each employee's personnel file. The form in Exhibit 1C may be used to document training.

8.0 Non-routine Tasks

Occasionally, employees may be required to do jobs that are not part of their everyday work schedule. These jobs are termed non-routine tasks. Each supervisor is responsible for informing employees of the hazards associated with the specific task prior to performance of the assigned project. The information provided by the supervisor includes:

- Chemical and physical hazards of the job
- Precautionary measures to be taken
- Available control measures
- Personal protective equipment required
- Emergency procedures

Examples of a non-routine tasks that may be performed by employees include cleanup of spills, asbestos removal and other tasks.

9.0 Chemicals in Unlabelled Pipes

Prior to starting work on unlabelled pipes, employees are required to contact their supervisor for information on:

- Chemicals in the pipe
- Potential hazards
→ Safety precautions that must be taken

10.0 Informing Contractors

Independent contractors may work at the University in areas where hazardous substances are used. To ensure that contractors work safely, they are given the following information by the University contact person.

→ List of the hazardous substances to which they may be exposed while performing their work
→ Explanation of the precautions their employees may take to lessen the risk of exposure

Additionally, the University requires contractors to provide MSDSs for the chemicals they bring on site. The MSDS must be sent to the EHSO.
Defining "Hazardous"

The criteria used to define chemicals as "hazardous" have evolved from several properties that are harmful to people and property. The most obvious of these criteria are the following:

- **Flammable**
  The material can catch fire or explode.

- **Toxic**
  The material can be harmful if individuals are exposed to it briefly or over long periods of time. The exposure could come about through ingestion (swallowing it), inhalation, or absorption through the skin or eyes.

- **Reactive**
  The material can release harmful by-products if subjected to certain environmental changes such as heat or pressure.

- **Corrosive**
  The material has caustic or acid-like properties.

How These Criteria Relate to Material Data Safety Data Sheets

Materials that fall into any of the above categories are to be considered "hazardous," but may be identified in different sections of the Material Safety Data Sheets, depending on the specific hazard. The guidelines:

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Listing Category</th>
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<tbody>
<tr>
<td>Flammable</td>
<td>Section IV: &quot;Fire and Explosion Data&quot;</td>
</tr>
<tr>
<td>Toxic</td>
<td>Section II - &quot;Hazardous Ingredients&quot;</td>
</tr>
<tr>
<td></td>
<td>Section V - &quot;Health Hazard Information&quot;</td>
</tr>
<tr>
<td>Reactive</td>
<td>Section VI</td>
</tr>
<tr>
<td>Corrosive</td>
<td>Section V</td>
</tr>
</tbody>
</table>
Determining Degree of Hazard

The following guidelines should be followed when evaluating the flammability or inhalation toxicity of a material.

→ Flash Point - The temperature to which the substance must be heated (under defined conditions) before a flame will ignite the vapor above the substance.

The following degrees of hazard have been established:

Combustible liquid - A liquid having a flash point at or above 100 degrees Fahrenheit (37.8 degrees Centigrade).

Combustible liquids are subdivided as follows:

Class II liquids shall include those having flash points at or above 100 degrees Fahrenheit (37.8 degrees Centigrade) and below 140 degrees Fahrenheit (60 degrees Centigrade).

Class IIIA liquids shall include those having flash points at or above 140 degrees Fahrenheit (60 degrees Centigrade) and below 200 degrees Fahrenheit (93 degrees Centigrade).

Class IIIB liquids shall include those having flash points at or above 200 degrees Fahrenheit (93 degrees Centigrade).

Flammable liquid - a liquid having a flash point below 100 degrees Fahrenheit (37.8 degrees Centigrade) and having a vapor pressure not exceeding 40 lbs. per square inch (absolute) (2,068 mm Hg) at 100 degrees Fahrenheit (37.8 degrees Centigrade) shall be known as a Class I liquid.

Class I liquids shall be divided as follows:

Class IA shall include those having flash points below 73 degrees Fahrenheit (22.8 degrees Centigrade) and having a boiling point below 100 degrees Fahrenheit (37.8 degrees Centigrade).

Class IB shall include those having flash points below 73 degrees Fahrenheit (22.8 degrees Centigrade) and having a boiling point at or above 100 degrees Fahrenheit (37.8 degrees Centigrade).

Class IC shall include those having flash points at or above 73 degrees Fahrenheit (22.8 degrees Centigrade) and below 100 degrees Fahrenheit (37.8 degrees Centigrade).
Toxicity

The following cases are commonly used when describing levels of toxicity:

<table>
<thead>
<tr>
<th>Commonly Used Term</th>
<th>LD Single Oral Dose for (g/kg)</th>
<th>Vapor Exposure Causing 2 to 4 Deaths in 6 Rat Groups (ppm)</th>
<th>LD Skin for Rabbits (g/kg)</th>
<th>LD Lethal Dose For Man</th>
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<tr>
<td>Extremely Toxic</td>
<td>0.001 or less</td>
<td>Less than 10</td>
<td>0.005 or less</td>
<td>Taste (1 grain)</td>
</tr>
<tr>
<td>Highly Toxic</td>
<td>0.001 to 0.05</td>
<td>10 to 100</td>
<td>0.005 to 0.043</td>
<td>1 tsp. (4 cc)</td>
</tr>
<tr>
<td>Moderately Toxic</td>
<td>0.05 to 0.5</td>
<td>100 to 1000</td>
<td>0.044 to 0.340</td>
<td>1 oz. (30 gm)</td>
</tr>
<tr>
<td>Slightly Toxic</td>
<td>0.5 to 5.0</td>
<td>1000 to 10,000</td>
<td>0.35 to 2.81</td>
<td>1 pint (250 gm)</td>
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<tr>
<td>Practically Non-Toxic</td>
<td>5.0 to 15.0</td>
<td>10,000 to 100,000</td>
<td>2.82 to 22.6</td>
<td>1 quart</td>
</tr>
<tr>
<td>Relatively Non-Toxic</td>
<td>&gt;15.0 to &gt;100,000</td>
<td>&gt;100,000</td>
<td>&gt;22.6</td>
<td>&gt; 1 quart</td>
</tr>
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APPENDIX B

LISTING HAZARDOUS CHEMICALS

HOW TO IDENTIFY HAZARDOUS CHEMICALS

Hazard Determination
The responsibility for determining whether a chemical is hazardous lies with the chemical manufacturer or importer of a chemical. As a user of chemicals, you may rely on the evaluation received from these suppliers through labels on containers and MSDS.

Definition
A hazardous chemical is defined as any chemical which is a physical or health hazard. This includes chemicals which are combustible liquid, compressed gas, explosive, flammable, organic peroxide, oxidizer, pyrophoric, unstable (reactive), water reactive, toxic, highly toxic, carcinogen, reproductive toxin, irritant, corrosive, sensitizer, hepatotoxin, nephrotoxin, neurotoxin agents which act on the hematopoietic (blood forming) system, and agents which damage the lungs, skin, eyes or mucous membranes.

Minimum List ("Floor List")
A Minimum List of hazardous chemicals, often called the "floor list" is provided in Appendix C. At a minimum the following chemicals are considered hazardous:

- Regulated by OSHA in 29 CFR Part 1910 Subpart Z
- Included in the American Conference of Governmental Industrial Hygienist (ACGIH) latest edition of Threshold Limits Values For Chemical Substances and Physical Agents in the Work Environment
- Listed in the latest edition of the National Toxicology Program's Annual Report on Carcinogens
- Listed in the latest edition of the International Agency for Research on Cancer (IARC) monographs

Mixtures
If a mixture is not evaluated specifically by the manufacturer or importer, assume it is hazardous if the mixture meets any of the following:

- Contains 1% or more of any chemical in the floor list
- Contains 0.1% or greater of a carcinogen
- Under conditions of use, the mixture could release concentrations that exceed recommended or legal exposure limits of any component
Mixtures produced by work operations such as fumes, vapors or dusts should also be evaluated using these guidelines.

CONSUMER PRODUCTS
Consumer products purchased for employee use are considered hazardous if they fit the definition of hazardous chemical(s).

HOW TO LIST CHEMICALS IN THE WORKPLACE

→ List all hazardous chemicals known to be present in your workplace. Use a name that appears both on the MSDS and the container label. A convenient form is provided in Exhibit 1A.

→ The list is to be an inventory of everything for which a MSDS must be obtained. It will be part of the written program, and must be available to employees upon request.

→ In addition to obvious chemicals such as solvents, one should also include commercial products such as adhesives, aerosols, cleaning agents, detergents, glues, inks, janitorial supplies, paints and surfactants.
INTRODUCTION
University employees handle, store, and use a variety of chemicals each day. In order to minimize the risk of chemical exposure to employees, it is important to understand how to protect yourself and what to do in the event of an emergency. A Material Safety Data Sheet (MSDS) provides the user with this information.

DOSH regulations specify the information that must be contained in a completed MSDS; however, the MSDS does not have to follow any set format. Consequently, the MSDSs received from various manufacturers may appear different. However, each must contain certain types of information.

The following information is intended to serve as a general guide to assist in the evaluation and understanding of a MSDS. This MSDS User's Guide is presented using the Occupational Safety and Health Administration (OSHA) form No. 174 (see Exhibit 1D) to describe data typically found in an MSDS and the general arrangement or location of data. An explanation of each section of the form follows.

SECTION I: PRODUCT IDENTIFICATION

General Comments:
The identity of the material must be included on the MSDS. This identity will usually be a systematic, scientific name, often with a unique Chemical Abstract Service (CAS) registry number. The product identity on the MSDS must match the identity on the label affixed to the chemical container.

Sometimes common synonyms are used for the products. Every known chemical designation or competitor's trade name is not necessarily listed.

<table>
<thead>
<tr>
<th>Manufacturer's Name, Address, and Telephone Number</th>
<th>The manufacturer of the product is listed along with the manufacturer's address and telephone number for non-emergency information.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Telephone Number</td>
<td>The telephone number for information on the chemical in</td>
</tr>
</tbody>
</table>

SECTION II: HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

General Comments:
The terms listed in this section should be those components in the product which individually meet any criteria for a defined hazardous substance. A component of a multi-component product might be listed based on its toxicity, flammability, reactivity, or combination of these. CAS numbers are not required to be listed under the Federal or Hawaii Hazard Communication Standard, but are required under California's Hazard Communication Standard.

<table>
<thead>
<tr>
<th>Chemical Names</th>
<th>Names of the product's hazardous ingredients.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS Number</td>
<td>A unique identification number assigned to a chemical or product by the Chemical Abstract Service (CAS).</td>
</tr>
<tr>
<td>TLV</td>
<td>Threshold Limit Value (TLV) is a term used by the American Conference of Governmental Industrial Hygienists (ACGIH) to express the</td>
</tr>
</tbody>
</table>
SECTION III: PHYSICAL/CHEMICAL CHARACTERISTICS

General Comments:
The data in this section should be for the total mixture or product. The information provided in this section is useful for the control of toxic vapors and for designing proper ventilation systems.

**Vapor Density**
Relative density or weight of a vapor or gas compared to the weight of an equal volume of air. Materials lighter than air will have vapor densities less than 1.0. Materials heavier than air will have vapor densities greater than 1.0.

**Specific Gravity**
The ratio of the weight of a volume of materials to the weight of an equal volume of water.

**Solubility in Water**
The percentage of a material that will dissolve in water at a specified temperature. Less than 0.1% considered negligible; 0.1% to 10% is moderate; more than 10% is appreciable and, if it can be dissolved in all proportions, it has complete solubility.

**Vapor Pressure**
The pressure exerted by gas or vapor from the surface of the liquid in a closed container.
A high vapor pressure indicates that a liquid will evaporate easily.

**Evaporation Rate**
The rate at which a material will evaporate when compared to a reference material (such as butyl acetate). If a substance has an evaporation rate greater than 1, it evaporates more easily than the reference material. If the rate is less than 1, it evaporates more slowly than the reference material.

**Appearance and Odor**
The color, form, and other identifying features of the material, to help identify the substance.

**Melting Point**
The temperature at which a solid changes to a liquid state.

**Boiling Point**
The temperature at which a liquid changes to vapor state at a given pressure.

**Percent Volatile by Volume**
Refers to the percentage of a liquid or solid (by volume) that will evaporate at an ambient temperature of 70 degrees Fahrenheit or 15.5 degrees Centigrade. This information may be found in place of melting point.

---

**SECTION IV: FIRE AND EXPLOSION HAZARD DATA**

**General Comments:**
This section should contain the appropriate fire and explosion data for the product. If the product poses no fire hazard, a statement to that effect should be included in this section.

**Flash Point (Method Used)**
The lowest temperature at which a liquid gives off enough vapor to form a ignitable mixture in air in a test container. Since flashpoints vary according to how they are obtained, the methods used are also listed. Tag Closed Cup (TCC), Penshymartens Closed Cup (PMCC), and Setaflash (SETA) methods are those used most extensively.

**Flammable Limits**
When flammable vapors are mixed with air in the proportions, the mixture can be ignited by a spark or flame. The range of concentrations over which the flash will occur is
SECTION V: REACTIVITY DATA

**General Comments:**
This section relates to safe storage and handling of unstable hazardous substances. Essential information regarding the instability or incompatibility of the product to common substances or circumstances such as water, direct sunlight, metals used in piping, or containers, acids alkalies, etc. Under "Hazardous Decomposition Products", dangerous products created by aging should be included, like the production of peroxides in the decomposition of some ethers. The product's shelf life should also be indicated under this section when applicable.

**Stability**
An indication of the ability of the material to remain unchanged under reasonably foreseeable conditions. Conditions which may cause instability are stated.
SECTION VI: HEALTH HAZARD DATA

General Comments:
This section should be a combined estimate of the hazard of the total product. Severity of the effect of exposure and basis for the finding, such as animal or human studies may be included.

**Incompatibility**
Common materials that could cause dangerous reactions when in contact with the product are listed.

**Hazardous Decomposition Products**
Hazardous products that may be produced when the material breaks down (by heat, chemical reaction, oxidation, decay, or other processes).

**Hazardous Polymerization**
Polymerization is a chemical reaction in which two or more small molecules combine to form larger molecules that contain repeating structural units of the original molecules. A hazardous polymerization is the above reaction with an uncontrolled release of energy.

**Symptoms of Overexposure**
Physical signs of overexposure (inhalation, skin, or eye contact, absorption through the skin and ingestion).

**Health Effects or Risks From Exposure**
Acute health effects which develop quickly from a single dose or short exposure to a substance are described. Chronic health effects which develop slowly over a long period of time, or recur frequently are also described.

**First Aid and Emergency Procedure**
First Aid procedures to follow until professional medical help is available in case of eye contact, skin contact swallowing, or breathing excessive amounts of the material are described.

**Suspect Cancer Agent**
This section states whether the product has been found to be a carcinogen (cancer causing agent) by any of the sources listed.

**Medical Conditions Aggravated by Exposure**
Medical conditions which are aggravated by exposure to the material are listed.
### SECTION VII: PRECAUTIONS FOR SAFE HANDLING AND USE

<table>
<thead>
<tr>
<th>Carcinogenicity</th>
<th>The product has the ability to produce cancer. A chemical or product is considered to be a carcinogen or potential carcinogen if it is listed in the International Agency for monographs, National Toxicology Program (NTP) report, or OSHA list of regulated carcinogens.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Spill and Leak Procedures</th>
<th>This describes methods for control and cleanup of spills or leaks. Appropriate materials, equipment, and personal protective equipment clothing are also listed.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Preparing Wastes for Disposal</th>
<th>Methods for packaging, neutralizing, or otherwise preparing waste product for disposal are described. Methods should be explicit, including proper labeling and handling of containers holding cleanup residue and specify acceptable disposal methods, such as sanitary landfill, incineration, etc.</th>
</tr>
</thead>
</table>

### SECTION VIII: CONTROL MEASURES

<table>
<thead>
<tr>
<th>Ventilation and Engineering Controls</th>
<th>The type of ventilation which may be used is described. General exhaust removes contaminated air circulation or exchange system. Local captures and removes contaminants from the air at the point where the contaminants are released.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Respiratory Protection</th>
<th>Devices (respirators) for use in conditions exceeding exposure limits when properly selected, maintained, operated, and worn by the user, will protect the user's respiratory system from overexposure to airborne contaminants by inhalation.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Eye Protection</th>
<th>The type of eye protection needed for handling the product.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gloves</strong></td>
<td>The type and material of gloves to use for protection of skin.</td>
</tr>
<tr>
<td><strong>Other Clothing and Equipment</strong></td>
<td>Additional clothing or personal protective equipment which may be needed to prevent exposure to a material.</td>
</tr>
<tr>
<td><strong>Work/Hygienic Practices</strong></td>
<td>Any specific practices for working with the material are described.</td>
</tr>
<tr>
<td><strong>Other Handling and Storage Requirements</strong></td>
<td>Specific requirements for storing and handling the material described.</td>
</tr>
<tr>
<td><strong>Protective Measures During Maintenance of Contaminated Equipment</strong></td>
<td>Additional precautions for handling contaminated equipment.</td>
</tr>
</tbody>
</table>
EXHIBIT 1A

Date of Inventory: ____________________________________________
Department: ________________________________________________
Building and Room #: _________________________________________
Completed By: ________________________________________________

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>Manufacturer</th>
<th>Label*</th>
<th>Date of MSDS</th>
</tr>
</thead>
</table>

* Y = Yes, label or MSDS present  
  N = No, label or MSDS not present  
  I = Inadequate label or MSDS
EXHIBIT 1B

OUTLINE FOR HAZARD COMMUNICATION TRAINING

I. OVERVIEW OF HAZARD COMMUNICATION REGULATIONS

A. HIGOSH HAZARD COMMUNICATION STANDARD (Title 12, Subtitle 8, Chapter 203)

B. WHAT IS THE PURPOSE?
   1. Evaluation of Hazards
   2. Transmit Information

C. WHO MUST COMPLY?
   1. Manufacturers, Importers, Distributors of Hazardous Substances
   2. Employers: Users of Hazardous Substances

D. WHAT IS CONSIDERED A HAZARDOUS SUBSTANCE?
   1. Physical or Health hazards
   2. 29 CFR Part 1910, Subpart Z (OSHA)
   3. HIGOSH (Chapter 202 - Toxic Materials and Harmful Physical Agents)
   4. TLV's (ACGIH)

E. CARCINOGENS
   1. IARC Monographs (International Agency for Research on Cancer)
   2. HIGOSH (Chapter 202)

F. REQUIREMENTS
   1. Manufacturers, Importers, Distributors
      a. Evaluate
      b. Label Containers
      c. Provide MSDSs
   2. Employers
      a. Develop Written Hazard Communication Program
      b. Label Containers
      c. Obtain Material Safety Data Sheets
      d. Inform/Train Employees
G. WRITTEN HAZARD COMMUNICATION PROGRAM

1. Labels
2. Material Safety Data Sheets
3. Employee Information and Training
4. List of Hazardous Substances
5. Non-routine Tasks
6. Unlabeled Pipes
7. Contractor Procedures

II. LABELS

A. MANUFACTURER’S LABEL

1. Identify Hazardous Substances
2. Appropriate Hazard Warning
3. Name and Address of Manufacturer

B. SECONDARY CONTAINERS

1. Identify Hazardous Substance
2. Appropriate Hazard Warning

III. MATERIAL SAFETY DATA SHEETS

See Separate Handout

IV. EMPLOYEE INFORMATION AND TRAINING

A. Hazard Communication Requirements
B. Operations Where Hazardous Substances are Present
C. Location and Availability of Written Program
D. Detecting Hazardous Substances Presence or Release
E. Physical/Health Hazards
F. Protective Measures
G. Labeling System
H. Material Safety Data Sheet (MSDS)
I. Obtaining Hazard Information
EXHIBIT 1C
HAZARD COMMUNICATION TRAINING RECORD

Training Topics:

- Requirements of Hazard Communication Program
- Employee Rights
- MSDS - How to and Contents
- Written Program
- Physical and Health Effects of Hazardous Substances
- Detection of Hazardous Substances
- How to Prevent Exposure

Instructor(s):

Date: ____________________

Location: ____________________

<table>
<thead>
<tr>
<th>Name (Please Print)</th>
<th>Department</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
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<td>1.</td>
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<td>19</td>
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<tr>
<td>20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


**Material Safety Data Sheet**

May be used to comply with OSHA’s Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

**IDENTITY (as Used on Label and List)**

<table>
<thead>
<tr>
<th>Manufacturer’s name</th>
<th>Emergency Telephone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address (Number, Street, City, State and ZIP Code)</td>
<td>Telephone Number for Information</td>
</tr>
</tbody>
</table>

**Date Prepared**

**Signature of Preparer (optional)**

**Section II—Hazardous Ingredients/Identity Information**

<table>
<thead>
<tr>
<th>Hazardous Components (Specific Chemical Identity, Common Name(s))</th>
<th>OSHA PEL</th>
<th>ACGIH TLV</th>
<th>Other Limits Recommended</th>
<th>% (optional)</th>
</tr>
</thead>
</table>

**Section III—Physical/Chemical Characteristics**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>Specific Gravity (H₂O = 1)</td>
</tr>
<tr>
<td>Vapor Pressure (mm Hg)</td>
<td>Melting Point</td>
</tr>
<tr>
<td>Vapor Density (Air = 1)</td>
<td>Evaporation Rate (Units, Test)</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Appearance and Odor</td>
</tr>
</tbody>
</table>

**Section IV—Fire and Explosion Hazard Data**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point (Method Used)</td>
<td>Flammable Limits</td>
</tr>
<tr>
<td>Lower and Upper Limits</td>
<td>OEL</td>
</tr>
</tbody>
</table>

Extinguishing Media

Special Fire Fighting Procedures

Unusual Fire and Explosion Hazards

(OSHA) 11/4 Sept. 1988

(Reduced locally)
## Section V—Reactivity Data

<table>
<thead>
<tr>
<th>Stability</th>
<th>Unsuitable</th>
<th>Conditions to Avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Incompatibility (Materials to Avoid)

### Hazardous Decomposition or Reactions

<table>
<thead>
<tr>
<th>Polymerization</th>
<th>May Occur</th>
<th>Conditions to Avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Will Not Occur</td>
<td></td>
</tr>
</tbody>
</table>

## Section VI—Health Hazard Data

### Mode(s) of Entry

- Inhalation?
- Skin?
- Ingestion?

### Health Hazards (Acute and Chronic)

### Carcinogenicity

- NTP?
- IARC Monographs?
- OSHA Regulated?

### Signs and Symptoms of Exposure

### Medical Conditions Generally Aggravated by Exposure

### Emergency and First Aid Procedures

## Section VII—Precautions for Safe Handling and Use

### Safety Data Sheet Material Is Released or Spilled

### Waste Disposal Method

### Precautions to Be Taken in Handling and Storage

### Other Precautions

## Section VIII—Control Measures

### Respiratory Protection (Specify Type)

<table>
<thead>
<tr>
<th>Type</th>
<th>NIOSH, AHA, EPA</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Ventilation

<table>
<thead>
<tr>
<th>Type</th>
<th>Local Exhaust</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Protective Glasses

<table>
<thead>
<tr>
<th>Type</th>
<th>Eye Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Other Protective Clothing or Equipment

### Work Hygienic Practices

<table>
<thead>
<tr>
<th>Practice</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>
APPENDIX 8

HAZARD ASSESSMENT GUIDE

In order to determine the need for PPE, a walk-through survey of the workplace should be done to identify hazards. These are the basic hazards that you should look for:

- Impact
- Penetration
- Compression (roll over)
- Chemical
- Heat
- Harmful dust
- Light (optical) radiation

During the survey, you should look for:

- Machinery, processes, or sources of motion where any movement of tools, machine part or personnel could result in collision with stationary objects;
- Sources of high temperatures that could cause burns, eye injuries, or ignite protective equipment;
- Types of chemical exposures;
- Sources of light radiation (welding, brazing, cutting, furnaces, heat treating, high intensity lights, etc.);
- Sources of falling objects or potential for dropping objects;
- Sources of sharp objects that might pierce feet or cut hands;
- Sources of rolling or pinching objects that could crush feet;
- The layouts of the workplace and the location of co-workers;
- Any electrical hazards.

Also, you should check injury/accident data to help identify problem areas.

After you assess the hazards in your workplace, organize and analyze the information to decide what protective equipment is needed. You should estimate how serious each hazard is in terms of its level of risk and potential to cause injury. Also, consider the possibility of a worker being exposed to several hazards at once.

1. Selecting PPE to guard against the hazards and the type of PPE available and what it can do (impact protection, splash protection, etc.)

2. Compare the hazards to the capabilities of the PPE.
3. Selecting PPE that ensures a level of protection greater than the minimum required to protect employees from the hazards.

4. Fit PPE users and give instructions on the care and use of the equipment. It is very important that users are aware of all warning labels and limitations of their PPE.

As a reminder, workplace hazards should be reassessed as needed by identifying and evaluating new equipment and processes, reviewing accident records, and re-evaluating the suitability of previously selected PPE.
APPENDIX 9

LABORATORY INSPECTION CHECKLIST

LABORATORY CHECK-UP

<table>
<thead>
<tr>
<th></th>
<th>GENERAL</th>
<th>YES</th>
<th>NO</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Laboratory work and storage areas are clean and orderly?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Emergency notification procedures, contacts, and phone numbers are posted?</td>
<td></td>
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</tr>
<tr>
<td>c.</td>
<td>First aid kit readily accessible?</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Adequately stocked?</td>
<td></td>
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</tr>
<tr>
<td>d.</td>
<td>Aisles have minimum 26 inches clearance?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>e.</td>
<td>Food is stored properly; i.e., not in refrigerators or cabinets used to store laboratory samples or chemicals?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f.</td>
<td>Bicycles are not stored in the laboratory?</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>g.</td>
<td>Safety guards are in place for equipment with moving parts (belts, fans, saw blades)?</td>
<td></td>
<td></td>
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<tr>
<td>h.</td>
<td>Multicorded connectors (power strips) are secured?</td>
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<tr>
<td>i.</td>
<td>Equipment cord insulation is intact; i.e., not crimped or frayed?</td>
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<tr>
<td>j.</td>
<td>Equipment is grounded?</td>
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<tr>
<td>k.</td>
<td>A trash container is specifically designated for disposal?</td>
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<tr>
<td>l.</td>
<td>No trip hazards (e.g., cords, equipment, etc.)</td>
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<tr>
<td>m.</td>
<td>Safety shower and/or eyewash stations are easily accessible?</td>
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<td>n.</td>
<td>Exit doors are unobstructed?</td>
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<tr>
<td>c.</td>
<td>A fire extinguisher is readily accessible?</td>
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<td></td>
<td>Insulation, etc. current?</td>
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<tr>
<td></td>
<td>Other (security or other issues)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. HAZARDOUS CHEMICALS &amp; WASTE</td>
<td>YES</td>
<td>NO</td>
<td>COMMENTS</td>
<td></td>
</tr>
<tr>
<td>---------------------------------</td>
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</tr>
<tr>
<td>a. All containers are intact and properly labelled, including hazard identification?</td>
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<tr>
<td>b. Chemicals and waste are segregated by hazard class and chemical compatibility?</td>
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<td></td>
</tr>
<tr>
<td>c. Glass containers not stored on floor?</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>d. Flammable liquids are properly stored and handled?</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>e. Perishable compounds are properly stored and labeled with last date opened?</td>
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<td></td>
</tr>
<tr>
<td>f. Water and air reactive compounds are properly stored?</td>
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<tr>
<td>g. Gas cylinders are stored properly?</td>
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<tr>
<td>h. Waste is properly labeled and stored in a designated satellite accumulation area?</td>
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</tr>
<tr>
<td>i. Old chemicals have been disposed?</td>
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<td>j. No evidence of chemical spills?</td>
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<td>k. Household type refrigerators are not used for flammable liquid storage?</td>
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<td>l. Fume hood has adequate airflow?</td>
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<tr>
<th>III. CHEMICAL HYGIENE PLAN</th>
<th>YES</th>
<th>NO</th>
<th>COMMENTS</th>
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<tr>
<td>a. Written plan is current?</td>
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<td>Readily accessible?</td>
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<tr>
<td>b. Laboratory personnel training is up-to-date?</td>
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<td>Documented?</td>
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<td>c. MSDS and chemical inventory are maintained and updated annually?</td>
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<td>d. Lab personnel are wearing appropriate PPE?</td>
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<td>Eye Protection</td>
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<td>Gloves</td>
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<td>Other</td>
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**Notes:**

**Inspection conducted by:**
APPENDIX 10

GENERAL INSPECTION CHECKLIST

PERSONAL PROTECTIVE EQUIPMENT

1. Is approved protective eye and face equipment provided to personnel who work in designated eye hazard areas? (29 CFR 1910.133(a)(1)); HIOSH 12-64-5(1))
   □ Yes  □ No  □ N/A

2. Is approved safety-toe footwear worn by personnel who work in areas where hazards exist which could result in foot or toe injuries? (i.e. heavy objects could drop or fall) (29 CFR 1910.132(a), (29 CFR 1910.136(a)); HIOSH 12-64-7)
   □ Yes  □ No  □ N/A

3. Is approved hearing protection provided to personnel? (29 CFR 1910.95(i)(1); HIOSH 12-64-4)
   □ Yes  □ No  □ N/A

4. Is approved head protection provided to personnel who are exposed to falling, flying objects and from limited electric shock and burn? (29 CFR 1910.132(a) 29 CFR 1910.135(a)); HIOSH 12-64-3)  □ Yes  □ No  □ N/A

5. Is there as drenching or flushing facility available to employees in the vicinity of a corrosive hazard? (29 CFR 1910.151(c)); HIOSH 12-62-6)  □ Yes  □ No  □ N/A

6. Is approved equipment available to protect brake and clutch mechanics from asbestos dust in the form of sprayers when utilizing the wet method or encapsulation devices equipped with HEPA-filter vacuum dust collectors? (29 CFR 1910.1001 (f) (1) (k) (4); HIOSH 12-202-13 Appendix F (Non-mandatory))
   □ Yes  □ No  □ N/A
7. Are personnel who are required to work in such a manner that their clothing may become wet, provided with rubber aprons, coats, jackets, sleeves or other garments required to keep their clothes dry? (29 CFR 1910.132; HIOSH 12-64-2(a))
   ☐ Yes ☐ No ☐ N/A

8. Are rubber or other impervious boots provided to personnel required to work in areas where their feet may become wet? (29 CFR 1910.132; HIOSH 12-64-9)
   ☐ Yes ☐ No ☐ N/A

9. Are personnel who are required to work with a liquid other than water, provided with gloves impervious to such a liquid? (29 CFR 1910.132; HIOSH 12-64-9
   ☐ Yes ☐ No ☐ N/A

10. Are respirators provided to personnel working in areas contaminated with harmful dust, fog, fumes, mists, gases, smokes, sprays, vapors or oxygen deficient environments? (29 CFR 1910.134 (a) (1) & (2); HIOSH 12-64-6(1))
    ☐ Yes ☐ No ☐ N/A

11. Are the respirators suitable/approved for the purpose intended? (29 CFR 1910.134 (a) (2)); HIOSH 12-64-6(1))
    ☐ Yes ☐ No ☐ N/A

12. Are there written standard operating procedures governing the selection and use of respirators? (29 CFR 1910.134 (b) (1); HIOSH 12-64-6(b)(1))
    ☐ Yes ☐ No ☐ N/A

13. Is the user instructed and trained in the proper use of respirators and their limitations? (29 CFR 1910.134 (b) (3)); HIOSH 12-64-6(b)(3)) ☐ Yes ☐ No ☐ N/A
14. Are respirators that are used routinely inspected during cleaning? Are worn or deteriorated parts replaced? (29 CFR 1910.134 (b)(7)); HIOSH 12-64-6(b)(6)
   ☐ Yes ☐ No ☐ N/A

15. Has training provided the opportunity for individuals to handle the respirator, have it fitted properly, test its face piece for proper seal, wear it in normal air for long period and to wear it in a test atmosphere? (29 CFR 1910.134 (e) (5)); HIOSH 12-64-6(e)(5)(A)
   ☐ Yes ☐ No ☐ N/A

16. After inspection, cleaning, and necessary repair, are respirators stored to protect them against dust, sunlight, heat, extreme cold, excessive moisture, or damaging chemicals? Are the respirators packed or stored so the face piece and exhalation valve rest in a normal position? (29 CFR 1910.134 (f) (5) (i)); HIOSH 12-64-6(f)(5)(A))
   ☐ Yes ☐ No ☐ N/A

17. Are all hazardous areas identified with hazard identification signs? (29 CFR 1910.145); HIOSH 12-70-2)
   ☐ Yes ☐ No ☐ N/A

18. Are first aid supplies approved by the consulting physician readily available? (29 CFR 1910.151 (b)); HIOSH 12-62-5(b))
   ☐ Yes ☐ No ☐ N/A

   ☐ Yes ☐ No ☐ N/A

20. Have workplace hazards assessment been completed? Have they been documented? (29 CFR 1910.132 (d)(1) & (2))
   ☐ Yes ☐ No ☐ N/A
Additional Comments:

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GENERAL ENVIRONMENTAL CONTROLS

1. Are all sweepings, solid or liquid wastes, refuse, and garbage removed in such a manner and as often as necessary to avoid a menace to health? (29 CFR 1910.141(a)(4)(ii); HIOSH 12-67-9(b)) □ Yes □ No □ N/A

2. Is every enclosed workplace so constructed, equipped, and maintained, so far as reasonably possible, to prevent the entrance or harborage of rodents or insects? (29 CFR 1910.141(a)(5)); HIOSH 12-67-10) □ Yes □ No □ N/A

3. Is a continuing, effective extermination program instituted where the presence of pests is detected? (29 CFR 1910.141(a)(5)); HIOSH 12-67-10)
   □ Yes □ No □ N/A

4. Do the number of toilet facilities provided meet the requirements for the number of employees? (29 CFR 1910.141(c), Table J-1); HIOSH 12-67-4(b)(c))
   □ Yes □ No □ N/A

5. Are washing facilities maintained in a sanitary condition? (29 CFR 1910.141(d)(1); HIOSH 12-67-5) □ Yes □ No □ N/A

6. Are lavatories provided with hot and cold running water, or tepid running water? (29 CFR 1910.141(d)(2)(iii)); HIOSH 12-67-4) □ Yes □ No □ N/A

7. Is hand soap or similar cleansing agents provided? (29 CFR 1910.141(d)(2)(iii)); HIOSH 12-67-5(b)(1)) □ Yes □ No □ N/A
8. Are individual hand towels or sections thereof, of cloth or paper, warm air blowers, or clean individual sections of continuous cloth toweling provided?
   (29 CFR 1910.141(d)(2)(iv)); HIOSH 12-67-4(d))  □ Yes  □ No  □ N/A

9. Are changing rooms equipped with separate storage for street clothes and separate storage for protective clothing provided whenever employees are required to wear protective clothing because of the possibility of contamination with toxic materials?
   (29 CFR 1910.141(e)); HIOSH 12-67-6  □ Yes  □ No  □ N/A

10. Are employees’ consumption of food or beverage in a toilet room or in any area exposed to toxic materials prohibited? (29 CFR 1910.141(g)(2)); HIOSH 12-67-7
    □ Yes  □ No  □ N/A

Additional Comments:
1. Are permanent aisles and passageways appropriately marked? (29 CFR 1910.22(b)(2)), (HIOSH 12-72-2(a)) ☐ Yes ☐ No ☐ N/A

2. Are all aisles and passageways kept in good repair with no obstructions across or in aisles at all times? (29 CFR 1910.22(b)(1)), (HIOSH 12-72-2(d)) ☐ Yes ☐ No ☐ N/A

3. Are floors maintained free of water, grease and other liquids which would create a slipping hazard? (29 CFR 1910. 22(a)(2)), (HIOSH 12-72-2(b)) ☐ Yes ☐ No ☐ N/A

4. Is every stairway floor opening guarded by a standard railing on exposed sides? (29 CFR 1910.23(a)(1) & 29 CFR 1910.23(c)(1)), (HIOSH 12-72-3(a)(1)) ☐ Yes ☐ No ☐ N/A

5. Are open pits, trap door floor openings or open tanks, vats, or ditches on adjacent grounds guarded by a floor opening cover of standard strength construction or guard rails? While the cover is not in place, the pit or trap opening shall be constantly attended by someone or protected on all exposed sides by removable standard railings? (29 CFR 1910.23(a)(5)), (HIOSH 12-72-3(a)(5);(6);(8)(b)) ☐ Yes ☐ No ☐ N/A

6. Is every open-sided floor or platform four (4) feet or more above adjacent floor or ground level guarded by a standard railing? (29 CFR 1910.23(c), 29 CFR 1910.23(e)(1) & (29 CFR 1910.23(e)(4)), (HIOSH 12-72-3(c)(1)) ☐ Yes ☐ No ☐ N/A

7. Is every flight of stairs having 4 or more risers equipped with standard stair railings or standard handrails? (29 CFR 1910.23(d)(1)), (HIOSH 12-72-3(d)(1)) ☐ Yes ☐ No ☐ N/A
8. Do stairways less than 44 inches wide, having both sides enclosed, have at least one handrail? (29 CFR 1910.23(d)(1)(i)), (HIOSH 12-72-3(d)(1)(A))  □ Yes  □ No  □ N/A

9. Do stairways less than 44 inches wide having one side open, have a stair railing on the open side? (29 CFR 1910.23(d)(1)(ii)), (HIOSH 12-72-3(d)(1)(B))  □ Yes  □ No  □ N/A

10. Do stairways less than 44 inches wide, having both sides open, have a stair railing on each side? (29 CFR 1910.23(d)(1)(111)), (HIOSH 12-72-3(d)(1)(C))  □ Yes  □ No  □ N/A

11. Do stairways more than 44 inches wide, but less than 88 inches wide have one (i) handrail on each enclosed side and one stair railing on each open side? (29 CFR 1910.23(d)(1)(iv)), (HIOSH 12-72-3(d)(1)(D))  □ Yes  □ No  □ N/A

12. Do stairways 88 inches or more wide, have one (1)-handrail on each enclosed side, (1) stair railing on each open side, and one (1) intermediate stair railing located approximately midway of the width? (29 CFR 1910.23(d)(1)(v)), (HIOSH 12-72-3(d)(1)(E))  □ Yes  □ No  □ N/A

13. Is vertical clearance above any stair tread to an overhead obstruction at least seven (7) feet measured from the leading edge of the tread? (29 CFR 1910.23(d)(1)(vi)), (HIOSH 12-72-4(a)(9))  □ Yes  □ No  □ N/A

Additional Comments:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
MEANS OF EGRESS

1. Are all exits free and unobstructed to allow for easy egress (exit) from buildings when occupied? (29 CFR 1910.36(b)(4); HIOSH 12-71-2(a)(4)) □ Yes □ No □ N/A

2. Are all exits prohibited from being locked or fastened when the building is occupied? (29 CFR 1910.36(b)(4); HIOSH 12-71-2(a)(4)) □ Yes □ No □ N/A

3. Is such exit clearly visible or the route thereto conspicuously indicated in such a manner that every occupant of every building or structure who is physically and mentally capable, will readily know the direction of escape from any point? (29 CFR 1910.36(b)(5); HIOSH 12-71-2(b)(5)) □ Yes □ No □ N/A

4. Is each path of escape arranged or marked so the way to a place of outside safety is unmistakable? (29 CFR 1910.36(b)(5); HIOSH 12-71-2(b)(5)) □ Yes □ No □ N/A

5. Are building exits marked with readily visible exit signs? Is access to exits marked by readily visible signs in all cases where the exit or way to reach it is not immediately visible to the occupant? (29 CFR 1910.37(q)(1); HIOSH 12-71-2(r)(1)) □ Yes □ No □ N/A

6. Is every exit sign suitably illuminated by a reliable light source giving a value of not less than five (5) foot candles on the illuminated surface? (29 CFR 1910.37(q)(6); HIOSH 12-71-2(r)(6)) □ Yes □ No □ N/A
7. When required by chapters 8 through 30 of NFPA 101, is emergency lighting installed to provide illumination not less than one (1) foot candle throughout the means of egress for a period of 1-1/2 hours in the event of failure of the normal lighting? (NFPA 101(5.9.1), (5.9.2.1)) □ Yes □ No □ N/A

8. Are stairs, aisles, corridors, ramps and, passageways leading to an exit illuminated at all points to a value of not less than five (5) foot candle measured at the floor? (NFPA 101 (5-8.1.3), 29 CFR 1910.36(b)(6); HIOSH 12-71-2(b)(6)) □ Yes □ No □ N/A

9. Has each emergency lighting been tested monthly for a minimum of 30 seconds and annually for a 1 1/2 hours duration? (NFPA 101(5.9.3), (31-1.3.8)); □ Yes □ No □ N/A

10. Has action been taken to effect the repair of emergency lighting that did not remain operational for the duration of the test? (NFPA 101(5.9.3), (31-1.3.7)) □ Yes □ No □ N/A

11. Are letters on exit signs not less than six (6) inches high with the principal strokes of the letter no less than 3/4 inches wide? (29 CFR 1910.37(q)(8); HIOSH 12-71-2(r)(8)) □ Yes □ No □ N/A

12. Are furnishings, decorations or other objects placed in such a manner as to not obstruct exits, access thereto, egress therefrom, or visibility thereof? (29 CFR 1910.37 (1); HIOSH 12-71-2(9)(1)) □ Yes □ No □ N/A

13. Can all exits be reached without going through a kitchen, storeroom, restroom, closet, or similar space subject to being locked? (NFPA 101(5.5.2.1), 29 CFR 1910.37(f)(3)); HIOSH 12-71-2(j)(3) □ Yes □ No □ N/A
14. Are at least two (2) separate exits provided for each floor level that are located remote from each other to minimize the possibility that both exits might be blocked by fire? (NFPA 101(5-4.1.1, 5-5.1.3, 29 CFR 1910.36(b)(8); HIOSH 12-71-2(b)(3))
☐ Yes  ☐ No  ☐ N/A

15. Do exit doors swing in the direction of exit travel when serving an occupant load of 50 or more people or from a high hazard area, or where used in an exit enclosure? (NFPA 101(5-2.1.4.1), 29 CFR 1910.37(f)(2); HIOSH 12-71-2(j)(2))
☐ Yes  ☐ No  ☐ N/A

16. When required by chapters 8 through 30 -of NFPA 101, are horizontal sliding or vertical doors used as exits in lieu of side hinged swinging doors secured in the full open position when the area is occupied? Is there a durable sign on or adjacent to the door indicating "This door to remain open when building is occupied"? (NFPA 101(5-2.1.4.1, Exception No. 3)  ☐ Yes  ☐ No  ☐ N/A

17. Are doors, in a required means of egress, equipped with panic hardware (quick release bar) for any area having an occupant load of 100 or more persons? (NFPA 101(5-2.1.7), (8-2.2.2.3), (9-2.2.2.3); 29 CFR 1910.37(k)(3))
☐ Yes  ☐ No  ☐ N/A

18. When exit doors are locked, can the door be unlocked from the inside without the use of a key or specific knowledge or effort? (NFPA 101(5-2.1.5.1); 29 CFR 1910.37(k)(3); HIOSH 12-71-2)
☐ Yes  ☐ No  ☐ N/A

19. Is there any door, passage or stairway, which is neither an exit nor a way of exit, that can be mistaken for an exit, properly marked - NOT AN EXIT? (29 CFR 1910. 37(q)(2); HIOSH 12-71-27)(2))  ☐ Yes  ☐ No  ☐ N/A

Additional Comments:
## FIRE PROTECTION

1. **Does the facility have a written fire emergency plan?**  
   (29 CFR 1910.38(a); HIOSH 12-71(a))  
   - Yes  
   - No  
   - N/A

2. **Does the facility have a written fire prevention plan?**  
   (29 CFR 1910.38(b); HIOSH 12-71(b))  
   - Yes  
   - No  
   - N/A

3. **Are portable fire extinguishers readily accessible to employees without subjecting the employees to possible injury?**  
   (29 CFR 1910.157(c)(1); HIOSH 12-63-4(c)(1))  
   - Yes  
   - No  
   - N/A

4. **Are the extinguishers hung on brackets or mounted in unlocked cabinets?**  
   (NFPA 10 1-6.10; HIOSH 12-63-4)  
   - Yes  
   - No  
   - N/A

5. **Are extinguishers of the appropriate type located in the facility in a fashion where an extinguisher may be reached within 75 feet for Class A and C extinguishers or 50 feet for Class B extinguishers from any location in the building?**  
   (29 CFR 1910.157 (d)(2), (4), (6); HIOSH 12-63-4)  
   - Yes  
   - No  
   - N/A

6. **Are fire extinguishers maintained in a fully charged and operable condition and kept in their designated places at all times except during use?**  
   (29 CFR 1910.157(c)(4); HIOSH 12-63-4)  
   - Yes  
   - No  
   - N/A

7. **Are portable fire extinguishers visually inspected monthly?**  
   (29 CFR 1910.157(e)(2); HIOSH 12-63-4)  
   - Yes  
   - No  
   - N/A
8. Are portable fire extinguishers subjected to an annual maintenance check?
(29 CFR 1910.157(e)(3); HIOSH 12-63-4) ☐ Yes ☐ No ☐ N/A

9. Is this maintenance check recorded and retained for one (1) year after the last entry or the life of the shell, whichever is less? (29 CFR 1910.157(e)(3); HIOSH 12-63-4)
☐ Yes ☐ No ☐ N/A

10. Is alternate equivalent protection provided when portable fire extinguishers are removed from service for maintenance and recharging? (29 CFR 1910.157(e)(5))
☐ Yes ☐ No ☐ N/A

11. Have extinguishers been hydrostatically tested and has results, date of test, test pressure used, and the person or agency performing the test been recorded?
(29 CFR 1910.157(f) (16 Table L-1; HIOSH 12-63-4)) ☐ Yes ☐ No ☐ N/A

12. Is a manual fire alarm station provided in the natural path of escape near each required exit from an area? (NFPA 101(7-6-2.3); HIOSH 12-63-4) ☐ Yes ☐ No ☐ N/A

13. Is each sleeping room provided with a single station smoke detector?
(NFPA 101(16-3.4.4.2), (17-3.4.4(i); HIOSH 12-63-12) ☐ Yes ☐ No ☐ N/A

Additional Comments:
________________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________
FLAMMABLE AND COMBUSTIBLE LIQUIDS

1. Are only approved containers and portable tanks used in the storage of flammable and combustible liquids? (29 CFR 1910.106 (d) (2) (i)), (HIOSH 12-75-2 (a))
   □ Yes   □ No   □ N/A

2. Are flammable and combustible liquids maintained in the immediate work area stored in approved storage cabinets? (These cabinets must be designed and constructed to limit the internal temperature not more than 325°F, when subjected to a 10 minute fire test as set forth in NFPA Code 251. The bottom, top, door, and sides of the cabinet must be at least No. 18 gauge sheet iron and double walled with 1.5 inch air space.)
   (29 CFR 1910.106(d)(3)(ii), (HIOSH 12-75-3 (d) (2))  □ Yes   □ No   □ N/A

3. Are more than sixty (60) gallons of Class I or Class II liquids or more than 120 gallons of Class III liquids stored in a cabinet?
   (29 CFR 1910.106(d)(3)(ii), (HIOSH 12-75-3 (d) (2) (D))  □ Yes   □ No   □ N/A

4. Are approved storage cabinets used to store flammable and combustible liquids labeled "FLAMMABLE - KEEP FIRE AWAY"? (29 CFR 1910.106(d)(3)(iii), (HIOSH 12-75-3 (d) (2) (c))  □ Yes   □ No   □ N/A

5. Are there provisions to contain the liquid in the event of spillage (liquid-tight raised sills or ramps at least four (4) inches in height) in inside storage rooms?
   (29 CFR 1910.106(d)(4)(1)), (HIOSH 12-75-3 (d) (3) (a)) □ Yes   □ No   □ N/A

6. Are openings to other inside storage rooms provided with approved self-closing fire doors?
   (29 CFR 1910.106(d)(4)(i)), (HIOSH 12-75-3 (d) (3) (a)) □ Yes   □ No   □ N/A
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<td>7</td>
<td>Is the room liquid-tight where the walls join the floor? (29 CFR 1910.106(d)(4)(i)), (HIOSH 12-75-3(d)(3)(a))</td>
<td>☐</td>
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<td>8</td>
<td>Is the wood used for shelving, racks, Dunnage, floor overlay, etc. at least one (1) inch nominal thickness? (29 CFR 1910.106(d)(4)(i)), (HIOSH (d) (2) (A))</td>
<td>☐</td>
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<td>Is capacity of inside storage rooms within the limits set forth in Table 75-3 or 75-4? (29 CFR 1910.106(d)(4)(ii)), (HIOSH 12-75-3(d)(4)(f)(i))</td>
<td>☐</td>
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<td>Does electrical wiring and equipment located inside storage rooms meet the requirements? (29 CFR 1910.106(d)(4)(iii)), (HIOSH 12-75-3(d)(3)(C))</td>
<td>☐</td>
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<td>11</td>
<td>Does ventilation system provide for a complete change of air within the room at least six times per hour? (29 CFR 1910.106(d)(4)(iv)), (HIOSH 12-75-3(d)(3)(D))</td>
<td>☐</td>
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<td>12</td>
<td>Is there at least one clear aisle not less than three (3) feet wide maintained at all times? (29 CFR 1910.106(d)(4)(iv)), (HIOSH 12-74-3(d)(3)(E))</td>
<td>☐</td>
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<td>13</td>
<td>Are flammable and combustible liquids prohibited from being stored in such a manner as to limit the use of exits, stairways, or areas normally used for the safe egress of personnel? (29 CFR 1910.106(d)(5)(i)), (HIOSH 12-75-3(d)(4)(A))</td>
<td>☐</td>
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14. Is a portable fire extinguisher located outside of, but not more than 10 feet from the door opening into any room or building used for storage? (29 CFR 1910.106(d)(7)(i)(a)), (HIOSH 12-75-3 (f)(1)(A))  ☐ Yes ☐ No ☐ N/A

15. Are open flames, smoking, and cooking prohibited in flammable and combustible liquids storage areas? (29 CFR 1910.106(d)(7)(iii)), (HIOSH 12-75-3 (f)(3))  ☐ Yes ☐ No ☐ N/A

16. Are water reactive materials prohibited from being stored in the same room with flammable and combustible liquids? (29 CFR 1910.106(d)(7)(iv)), (HIOSH 12-75-3 (f)(4))  ☐ Yes ☐ No ☐ N/A

Additional Comments:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
MATERIALS HANDLING AND STORAGE

1. Where mechanical handling equipment is used, has sufficient safe clearance been allowed for aisles, through doorways, and wherever turns or passage? (29 CFR 1910.176(a)), (HIOOSH 12-73-2(c)(2)) ☐ Yes ☐ No ☐ N/A

2. Are storage areas kept free from accumulation of materials that constitute a hazard from tripping, fire, explosion or pest harborage? (29 CFR 1910.176(c)), (HIOOSH 12-73-2(c)(1)) ☐ Yes ☐ No ☐ N/A

3. Is vegetation controlled in and around outside storage areas? (29 CFR 1910.176(c)), (HIOOSH 12-73-2(c)(1)) ☐ Yes ☐ No ☐ N/A

4. Is material stored in tiers so stacked blocked, interlocked and limited in height so they are stable and secure against sliding or collapse? (29 CFR 1910.176(b)), (HIOOSH 12-73-2(e)) ☐ Yes ☐ No ☐ N/A

Additional Comments: _____________________________________________________________
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POWERS INDUSTRIAL TRUCKS

1. Is battery changing and charging area of electrically powered industrial trucks provided with adequate ventilation and posted with "NO SMOKING" signs? (29 CFR 1910.178 (g) (i)) (HIOSH 12-90-1 (b)(3)and (11)) □ Yes □ No □ N/A

2. Are only trained and authorized personnel permitted to operate powered industrial trucks? (29 CFR 1910.178(l)) (HIOSH 12-81-5(m)) □ Yes □ No □ N/A

3. When traveling, are all traffic regulations observed to include speed limits, right of way and safe distances maintained? (29 CFR 1910.178(u)(1)) (HIOSH 12-81-5(o)(1)) □ Yes □ No □ N/A

4. Are periodic inspections of forklifts conducted and a record of major repairs including the date of such repairs kept and available? (HIOSH 12-81-5(t)(6)and (11)) □ Yes □ No □ N/A

5. Is load rating of forklift prominently displayed such as, on the side of the mast? (HIOSH 12-81-5(a)(6)) □ Yes □ No □ N/A

6. Are powered industrial trucks in need of repair or defective or unsafe in any way, taken out of service until they are restored to a safe operating condition? (29 CFR 1910.178(p)) (HIOSH 12-81-5(t)(6)) □ Yes □ No □ N/A

Additional Comments:
OVERHEAD CRANES

1. Is the rated load of the crane plainly marked on each side and clearly legible from the ground or floor? (to the operator while the operator is at the control station) (29 CFR 1910.179(b)(5)) (OISH 12-84-2 (C) and 12-84-4 (e)) □ Yes □ No □ N/A

2. If the crane has more than one hoisting unit, does each hoist have its rated load marked on it or its load block? (29 CFR 1910.179(b)(5)) (HIOSH 12-84-2 (C) and 12-84-4 (e)) □ Yes □ No □ N/A

3. Are signs posted and in plain view of the operator warning of the operation of the equipment near high voltage lines? Are protective measures provided? (29 CFR 1910.333(e)(3)) (HIOSH 12-84-2 (a)(2) and (a)(9)) □ Yes □ No □ N/A

4. Is there a minimum clearance of 5 inches overhead and 2 inches laterally provided and maintained between crane and obstructions? (29 CFR 1910.179(b)(6)) (HIOSH 12-84-4 (f)(1)) □ Yes □ No □ N/A

5. Are only designated (authorized) personnel permitted to operate the crane? (29 CFR 1910.179(b)(8)) (HIOSH 12-84-2 (s)) □ Yes □ No □ N/A

6. Are stops provided at the limits of travel of the trolley? (29 CFR 1910.179(e)(1)(ii)) (HIOSH 12-84-4 (j)(1)) □ Yes □ No □ N/A

7. If required, are bridge bumpers and trolley bumpers capable of stopping the crane? (29 CFR 1910.179(e)(2)(i)and (3)(i)) (HIOSH 12-84-4 (j)(2)(A)and (3)(A)) □ Yes □ No □ N/A

8. Do the sheaves and ropes of hoisting equipment meet the requirements of (29 CFR 1910.179(h)(1),(2))? (HIOSH 12-84-2 (g) and (h) wire rope and guards) □ Yes □ No □ N/A
9. Are periodic annual inspections performed on cranes, hooks, ropes, slings, chains & hoists? Is record available for all equipment inspections? (29 CFR 1910.179(j)(1)(ii)) (HIOSH 12-84-2 (f)) □ Yes □ No □ N/A

10. Are all new cranes and extensively repaired or altered lifting devices load tested at 125% prior to use? Is evidence of the test readily available in the form of the MFG's written certification or maintenance records? (29 CFR 1910.179(k)(1) and (2)) (HIOSH 12-84-2 (aa)(2)(A)) □ Yes □ No □ N/A

11. Are crane hooks visually inspected for deformation or cracks daily and are signed reports of this inspection recorded monthly? (29 CFR 1910.179(j)(2)(iii)) (HIOSH 12-84-2 (z)(3)(E)) □ Yes □ No □ N/A

12. Are crane hooks removed from service when they have been damaged by any means (the throat opening exceeds more than 15% of normal, or the hook shows more than a 10 deg twist from the plane of the bent hook or shows signs of cracks)? (29 CFR 1910.179(j)(2), CFR 1910.179(J)(2)(iii)) (HIOSH 12-84-2 (x)) □ Yes □ No □ N/A

13. Do hooks have safety closure latches and are they properly positioned and functional? (HIOSH 12-84-2 (x)(7)) □ Yes □ No □ N/A

Additional Comments:

DIP TANKS CONTAINING FLAMMABLE OR COMBUSTIBLE LIQUIDS

1. Is mechanical ventilation provided when dangerous quantities of flammable vapors are present? (29 CFR 1910.106(d)(4)(iv), (HIOSH 12-75-12(b)(1)))
   □ Yes □ No □ N/A

2. Are the dip tanks approved? (29 CFR 1910.106(d)(2)(i), (HIOSH 12-75-12(c)(1)))
   □ Yes □ No □ N/A

3. In order to prevent the ignition of flammable vapors, are open flames, smoking, spark producing devices, heated surfaces, and other activates with sufficient temperature to ignite vapors prohibited in any vapor area?
   (29 CFR 1910.106(e)(6)(1); 29 CFR 1910.108(b)(1)&(2), (HIOSH 12-75-12(c)(1)(A))
   □ Yes □ No □ N/A

4. Is electrical wiring and equipment, in any vapor area, of the approved type? (29 CFR 1910-106(e)(7)(i); 29 CFR 1910.307(b); 29 CFR 1910.108(e)(1)&(2), (HIOSH 12-75-12(c)(1)(A))
   □ Yes □ No □ N/A

5. Are combustible waste materials and residues stored in covered metal receptacles? (29 CFR 1910.106(e)(9)(iii)), (HIOSH 12-75-12(f)(2)) □ Yes □ No □ N/A

6. Are the contents of the cans properly disposed of at least once daily or at the end of the work shift? (29 CFR 1910.106(e)(9)(iii), (HIOSH 12-75-12(f)(2)) □ Yes □ No □ N/A
7. Are periodic inspections of the dip tank facilities made and defects corrected? (29 CFR 1910.108(f)(3)), (HIO SH 12-75-12(f)(3)) □ Yes □ No □ N/A

8. Are "NO SMOKING" signs posted in the vicinity of the dip tanks? (29 CFR 1910.108(f)(4)), (HIO SH 12-75-12(d)(4)) □ Yes □ No □ N/A

9. Are areas in the vicinity of the dip tanks provided with a portable fire extinguisher suitable for flammable and combustible liquid fires? (29 CFR 1910.106(d)(7)(i)), (HIO SH 12-75-12(g)(1)) □ Yes □ No □ N/A

10. Are dip tank covers arranged to close automatically, actuated by approved automatic devices in the event of fire and also arranged for manual operation? (29 CFR 1910.108(g)(6)(i)), (HIO SH 12-75-12(g)(6)(A)) □ Yes □ No □ N/A

11. Are covers kept closed when tanks are not in use? (29 CFR 1910.108(g)(6)(iv)), (HIO SH 12-75-12(g)(6)(D)) □ Yes □ No □ N/A

Additional Comments:

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COMPRESSED GAS CYLINDERS

1. Are full cylinders protected against excessive rise in temperature from direct rays of the sun or from other sources of heat not to exceed 130 deg F? (29 CFR 1910.253(b)(2)(ii)), (HIOSH 12-78.1-6 (b) (2) (A)) □ Yes □ No □ N/A

2. Is smoking prohibited within 50 ft of compressed gas storage area and "NO SMOKING" signs posted? (UH Campus Policy) □ Yes □ No □ N/A

3. When cylinders are stored inside of buildings, are they at least 20 feet (6 1 meters) from material such as oil or excelsior? (29 CFR 1910.253(b)(2)(ii)), (HIOSH 12-78.1-6 (b) (2) (B)) □ Yes □ No □ N/A

4. Are oxygen cylinders in storage separated from combustible materials (especially oil or grease), a minimum distance of 20 ft or by a noncombustible barrier at least five feet high having a fire resistant rating of at least 1/2 hour? (29 CFR 1910.253(b)(4)(iii)), (HIOSH 12-78.1-6 (b) (4)) □ Yes □ No □ N/A

5. Are acetylene and oxygen cylinders stored 100 ft apart or separated by an approved firewall having a fire resistant rating of at least 1/2 hour? (29 CFR 1910.253(b)(4)(iii)), (HIOSH 12-78.1-6 (b) (4)) □ Yes □ No □ N/A

6. When cylinders are not in use, are valves closed tightly and the valve protector caps installed? (29 CFR 1910.253(b)(2)(iii), 29 CFR 1910.253(b)(2)(iv), 29 CFR 1910.253(b)(5)(ii)(G)), (HIOSH 12-78.1-6 (b) (2) (D), HIOSH 12-78.1-6 (b) (5) (E)) □ Yes □ No □ N/A

7. When cylinders are standing upright during use or storage, has precautions been taken to prevent accidental upsetting or falling (chained or strapped to structure)? (29 CFR 1910.253(b) (2) (ii)), (HIOSH 12-78.1-6 (b) (2) (B)) □ Yes □ No □ N/A
MACHINERY AND MACHINE GUARDING

1. Are machine guards provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks? (29 CFR 1910.212(a)(1)) (HIOSH 12-80-2(a)(1))
   □ Yes  □ No  □ N/A

2. Are machines designed for a fixed location securely anchored to prevent walking or moving? (29 CFR 1910.212(b)) (HIOSH 12-80-2(b))
   □ Yes  □ No  □ N/A

3. Is a mechanical or electrical power control provided on each woodworking machine to enable the operator to cut off power without leaving his/her position at the point of operation? (29 CFR 1910.213(b)(1)) (HIOSH 12-80-4(b)(1))
   □ Yes  □ No  □ N/A

   □ Yes  □ No  □ N/A

5. Is the guard mounted so as to maintain proper alignment with the wheel? (29 CFR 1910.215(a)(2)) (HIOSH 12-80-5 (a)(2))
   □ Yes  □ No  □ N/A

6. Are work rests on abrasive wheel machinery kept closely adjusted to the wheel with a maximum opening of 1/8 inch? (29 CFR 1910.215(a)(4)) (HIOSH 12-80-5 (a)(5))
   □ Yes  □ No  □ N/A

7. Does the guard of a fan mounted within 7 feet of the floor or working level have openings no larger than 1/2 inch? (29 CFR 1910.212(a)(5)) (HIOSH 12-80-2 (a)(5))
   □ Yes  □ No  □ N/A

Additional Comments:
TIRE SERVICING EQUIPMENT FOR MULTI-PIECE WHEELS

1. Does the facility have on hand a serviceable approved safety cage? (29 CFR 1910.177(d)(1) and (2)) (HIOSH 12-81-2 (b)) ☐ Yes ☐ No ☐ N/A

2. Does the facility utilize an air hose of sufficient length (10 ft) with a clip on chuck to connect to the tire valve stem? (29 CFR 1910.177(d)(4)) (HIOSH 12-81-4 (c)(3)(F)) ☐ Yes ☐ No ☐ N/A

3. Does the facility have DOT posters posted or rim manuals in the tire servicing area on safety procedures for changing multi-piece wheel rims? (29 CFR 1910.177(d)(5)) (HIOSH 12-81-4 (b)(1)(B)and (2)) ☐ Yes ☐ No ☐ N/A

4. Does the facility have a program to train all employees who service rims wheels in the hazards involved and the safety procedures to be followed? (29 CFR 1910.177(c)) (HIOSH 12-81-4 (b)) ☐ Yes ☐ No ☐ N/A

Additional Comments:

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1. Is compressed air used for cleaning purposes reduced to less than 30 psi? (29 CFR 1910.242(b)) (29 CFR 1910.212(a)(1)) (HIOSH 12-79-4) □ Yes □ No □ N/A

2. Is effective chip guarding and personnel protective equipment provided and utilized? (29 CFR 1910.242(b)) (HIOSH 12-79-2 (b) and (c)) □ Yes □ No □ N/A

3. Is the operating control on hand-held power tools so located as to minimize the possibility of accidental operation, if such accidental operation would constitute a hazard to employees? (29 CFR 1910.243(a)(2)(iv)) (HIOSH 12-79-2 (d)) □ Yes □ No □ N/A

4. Do portable electric powered tools meet the electrical grounding requirements of Subpart S? (29 CFR 1910.243(a)(5)) (HIOSH 12-89-5 (f)(5)(E)(iii)) □ Yes □ No □ N/A

5. Is the load rating and date of next periodic inspection stenciled on A-Frames, shop floor cranes, hoist booms, and jacks? (29 CFR 1910.244(a)(1)(ii) covers only jacks; HIOSH 12-79-10 (a)(2) covers jacks; HIOSH 12-84-2 (c) covers cranes and booms) □ Yes □ No □ N/A

6. Have air receivers been inspected and tested at 12-month intervals and tags applied to show date of inspection and next scheduled inspection? (29 CFR 1910.169(a)(2)(i) and (b)(3)(iv), HIOSH 12-210-4 (c)(2)) □ Yes □ No □ N/A

Additional Comments: ________________________________
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OCCUPATIONAL NOISE EXPOSURE

1. Where employees are subjected to sound at or above 85 decibels on the A scale, are feasible administrative or engineering controls utilized? If such controls fail to reduce sound levels within 85 dBA, is personal protective equipment provided to those employees? Are those employees required to wear the personal protective equipment? (29 CFR 1910.95); HIOSH 12-200-9(a)
   ☐ Yes ☐ No ☐ N/A

2. Is an effective, continuing hearing conservation program established which included, but is not limited to, the following: (29 CFR 1910.95); HIOSH 12-200-100
   a. Periodic audiograms administered by certified personnel? ☐ Yes ☐ No ☐ N/A
   
   b. Employee notification of hearing test, and noise survey results?
      ☐ Yes ☐ No ☐ N/A

Additional Comments:

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1. Have areas with 500 volts rms (root-means-square) or greater been posted with safety signs indicating "HIGH VOLTAGE" and a current of 25 amperes or more been identified with a safety sign indicating "HIGH CURRENT"? (29 CFR 1910.145(c)(1))
   ☐ Yes ☐ No ☐ N/A

2. Is installed electrical equipment free from recognized hazards likely to cause death or serious physical harm to employees? (29 CFR 1910.303(b)), (HIOSH 12-89-4(h)(1))
   ☐ Yes ☐ No ☐ N/A

3. Have technicians, involved with electrical equipment, circuits, or transmission lines, been trained by qualified personnel in safety and the proper techniques of first aid, including rescue? (29 CFR 1910.332, 29 CFR 1910.151(b)) ☐ Yes ☐ No ☐ N/A

4. Have electrical workers been taught cardiopulmonary resuscitation (CPR) standard techniques by certified instructors, and annual refresher training thereafter? (29 CFR 1910.269(b)(1)) ☐ Yes ☐ No ☐ N/A

5. Are live parts of electrical equipment operating at 50 volts or more guarded against accidental contact by being enclosed in approved cabinets or other approved enclosures? (29 CFR 1910.303(g)(2)), (HIOSH 12-89-4(l)(g)(2)(A)) ☐ Yes ☐ No ☐ N/A

6. Is sufficient access and working space provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment? (29 CFR 1910.303 (g)(1)), (HIOSH 12-89-4(l)(g)(1)) ☐ Yes ☐ No ☐ N/A

7. Are outside power lines located a minimum of 10 ft above sidewalks or platforms, 12 ft over areas subject to vehicular traffic other than trucks, 15 ft over areas subject to truck traffic, and a minimum of 18 ft over public streets, alleys, roads, and driveways? (29 CFR 1910.304 (c)(2)) ☐ Yes ☐ No ☐ N/A
ELECTRICAL

8. Are all alternating current (AC) systems of 50 volts to 1000 volts in facilities properly grounded? (29 CFR 1910.304(f)(1); HIOSH 12-89-5(f)(1)(D))  □ Yes  □ No  □ N/A

9. Is the path to ground from circuits, equipment, and enclosures permanent and continuous? (29 CFR 1910.304(f)(4); HIOSH 12-89-5(f)(4))  □ Yes  □ No  □ N/A

10. Are receptacles grounded by being installed in a complete metallic raceway or by a separate grounding conductor (wire) and all receptacles electrically connected to the grounding conductor (wire)? (29 CFR 1910.303(b)(1); HIOSH 12-89-5(f)(5)(A))  □ Yes  □ No  □ N/A

11. Does each electrical outlet box, plug box, junction box, and cabinet have an installed faceplate, cover or canopy cover and are unused openings in cabinets and boxes effectively closed? (29 CFR 1910.305(b)(2); HIOSH 12-89-6(h)(1))  □ Yes  □ No  □ N/A

12. Is water or moisture-prevented from entering and accumulating within electrical cabinets, panel boards and junction boxes? (29 CFR 1910.305(e)(1); HIOSH 12-89-6(e)(1))  □ Yes  □ No  □ N/A

13. Are weather proof enclosures used in outside locations or wet locations? (29 CFR 1910.305(e)(2); HIOSH 12-89-6(e)(2))  □ Yes  □ No  □ N/A

14. Is motor operated equipment (i.e. hand held motor operated tools, portable hand lamps, refrigerators, air conditioners, etc.) properly grounded with a three prong plug (appliances protected by an approved system of double insulation need not be grounded)? (29 CFR 1910.304(f)(5)(v); HIOSH 12-89-5(f)(5)(E))  □ Yes  □ No  □ N/A
15. Are flexible cords and cables prohibited from use as a substitute for permanent wiring of a structure, and prohibited from being run through holes in walls, ceilings, or floors, running through doorways, windows, or similar openings? (29 CFR 1910.305(g)(1)(iii); (HIOSH 12-89-5(g)(1)(C)(ii-vi)) □ Yes □ No □ N/A

16. In electrical shops where dangerous voltage exists, is flooring and work surfaces protected with a non-conductive material? (29 CFR 1910.399(a)(2)(B)(ii)) □ Yes □ No □ N/A

17. Are safety signs and tags, barricades, attendants or other alerting techniques used to warn and protect employees from hazards which could cause injury due to electric shock, burns or failure of electric equipment parts? (29 CFR 1910.335(b); 29 CFR 1910.333(c)(8); HIOSH 12-89-34(b)(1-3)) □ Yes □ No □ N/A

18. Are personnel prohibited from wearing personal bracelets, watches, rings, or other metal objects when trouble shooting, repairing, or calibrating electrical/electronic equipment with exposed electricity? (29 CFR 1910.269(1)(6); HIOSH 12-89-32(c)(8)) □ Yes □ No □ N/A

20. Are two persons required to be in the immediate work area at all times while work is being performed on exposed circuits carrying over 50 volts rms or DC to assure that one person is available to render assistance in case of an accident? (29 CFR 1910.269(1)(1)(i)) □ Yes □ No □ N/A

Additional Comments:

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SPRAY PAINTING OPERATIONS

1. Is the average velocity of the exhaust air over the open face of dry type spray booths (or cross section during spraying operations) not less than 100 linear feet per minute? (29 CFR 1910.107(b)(5)(i); HIOSH 12-75-11(a)(5)(A)) □ Yes □ No □ N/A

2. Is the spray booth equipped with visible gauges or audible alarm or pressure activated devices to indicate or insure that the required air velocity is maintained? (29 CFR 1910.107(b)(5)(i); HIOSH 12-75-11(a)(5)(A)) □ Yes □ No □ N/A

3. Are sprinkler heads maintained free from deposits as practical by cleaning daily if necessary? (29 CFR 1910.107(f)(3); HIOSH 12-75-11(c)(3)) □ Yes □ No □ N/A

4. Is a clear space of not less than three (3) feet on all sides of the spray booth kept free from storage or combustible construction to provide ready access for cleaning? (29 CFR 1910.107(b)(9)(i); HIOSH 12-75-11(a)(9)) □ Yes □ No □ N/A

5. Is open flame or spark producing equipment prohibited in any spraying area or within 20 feet thereof, unless separated by a partition? (29 CFR 1910.252 (a)(2)(iii)(A)(1) & (2); HIOSH 12-75-11(b)(2)) □ Yes □ No □ N/A

6. Is electrical wiring and equipment to include lighting of explosion-proof type approved for Class, Group D, locations; and is electric lamps totally enclosed and protected from mechanical damage by suitable guards to prevent the falling of hot particles? (29 CFR 1910.107(c)(6); HIOSH 12-75-11(b)(6 & (7)) □ Yes □ No □ N/A

7. Is the exhaust duct system of the spray booth an independent system discharging to the exterior of the building? (29 CFR 1910.107(d)(3); HIOSH 12-75-11(c)(3)) □ Yes □ No □ N/A
8. Is the fan rotating element of nonferrous or nonsparking construction?
   (29 CFR 1910.107(d)(4); HIOSH 12-75-11(c)(4)) □ Yes □ No □ N/A

9. Is air exhaust from spray operations directed so that it will not contaminate makeup air being introduced into the spray booth? (29 CFR 1910.107(d)(9); HIOSH 12-75-11(c)(9))
   □ Yes □ No □ N/A

10. Is the quantity of flammable or combustible liquids kept in the vicinity of spraying operations limited to one day or one shift supply? (29 CFR 1910.107(e)(2); HIOSH 12-75-11(d)(2))
    □ Yes □ No □ N/A

11. Is an adequate supply of suitable portable fire extinguishers installed near air spraying operations? (29 CFR 1910.107(f)(4); HIOSH 12-75-11(e)(4)) □ Yes □ No □ N/A

12. Are painters provided and required to wear airline respirators, coveralls, and loose fitting hoods as personal protective equipment when painting with Chemical Agent Resistant Coating (CARC) Paint? (AEHA study #55-62-0259-87) □ Yes □ No □ N/A

13. Are “No Smoking” signs in large letters on contrasting color background conspicuously posted at all spraying areas and paint storage rooms? (29 CFR 1910.107(g)(7); HIOSH 12-75-11(f)(7)) □ Yes □ No □ N/A

Additional Comments:

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BATTERY CHARGING OPERATIONS

1. Does battery charging area provide general ventilation to control hydrogen gases emitted by lead-acid and nickel cadmium batteries? (29 CFR 1910.178(g)(2); 29 CFR 1910.305(j)(7); HIOSH 12-90-1 (b)(3)) □ Yes □ No □ N/A

2. Is ventilation system interlocked with battery charger to ensure that ventilation system is operating when batteries are on charge? (NFPA 410 2-2.13, HIOSH 12-69-3 (b)(1)) □ Yes □ No □ N/A

3. When local exhaust ventilation is used in the form of a hood at the charging rack, is a control velocity of at least fifty (50) feet per minute provided? (29 CFR 1910.178 (g)(2); and .305(j)(7); and 94(d)(4); HIOSH 12-69-5(a)(4)) □ Yes □ No □ N/A

4. Are protective gloves, apron and face shields (or chemical goggles) provided at all battery handling operations? (29 CFR 1910.132(a); HIOSH 12-90-1(b)(10) gloves not included) □ Yes □ No □ N/A

5. Are eye lavages and deluge showers provided and located in the immediate work area to provide an abundance of water for flushing the eyes or skin when splashes or spills of electrolyte have come in contact with the body? (29 CFR 1910.151(c); HIOSH 12-90-1(b)(9); HIOSH 12-62-6) □ Yes □ No □ N/A

6. Are periodic tests conducted to ensure that eye lavage and deluge shower are operational? (ANSI Z.358.1-1981; HIOSH 12-62-6) □ Yes □ No □ N/A

7. Is area under deluge shower and around eye lavage maintained clear and free of clutter and storage equipment? (ANSI Z.358.1-1981; HIOSH 12-62-6) □ Yes □ No □ N/A

8. Has explosion proof electrical equipment been installed in the battery charging area? (29 CFR 1910.307(b); HIOSH 12-89-8(b)(4)) □ Yes □ No □ N/A
VEHICLE EXHAUST VENTILATION

1. Is the tailpipe exhaust system properly maintained and in an acceptable operating condition? (TG-022(5)(III))
   ☐ Yes ☐ No ☐ N/A

2. Does the facility inspection records indicate evidence of periodic carbon monoxide monitoring? (DA PAM 750-72)
   ☐ Yes ☐ No ☐ N/A

3. Does the facility vehicle exhaust ventilation system provide a minimum of 400 CFM per diesel engine vehicle utilizing flexible ducts 4 1/2 in inside diameter? (TG-022 (10) (a))
   ☐ Yes ☐ No ☐ N/A

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WELDING OPERATIONS

1. When indoors and welding operations involving fluorine compounds, zinc, lead or welding over lead base paint, beryllium, cadmium, mercury, or stainless steel, is local ventilation provided utilizing flexible ducts with hoods being placed at the work with a velocity of 100 linear feet per minute or in compliance with the table contained in 29 CFR 1910.252(e)(3)(i) or HIOSH 12-78.1-4(c) □ Yes □ No □ N/A

2. Is general ventilation, with a minimum rate of 2,000 cubic feet per minute per welder provided when welding indoors on metals other than indicated in 1 above? (29 CFR 1910.252(c)(2)(ii); HIOSH 12-78.1-4(b)(2)) □ Yes □ No □ N/A

3. Is general ventilation, with a minimum rate of 2,000 cubic feet per minute per welder provided when welding indoors on metals other than indicated in 1 above? (29 CFR 1910.252(c)(2)(ii); HIOSH 12-78.1-4(b)(2)) □ Yes □ No □ N/A

4. Do welding or cutting goggles, helmets and face shields employ the correct filtered lens (shade number) for the welding operation? (29 CFR 1910.252(b)(2); HIOSH 12-78.1-3(b)(2)(H)) □ Yes □ No □ N/A

5. Are fire curtains provided and set up around welding operations to protect operators of nearby equipment? (29 CFR 1910.252(b)(2)(iii); HIOSH 12-78.1-2(b)(3)) □ Yes □ No □ N/A

Additional Comments:
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APPENDIX 11

ACCIDENTAL INJURY AND ILLNESS FORM

ACCIDENTAL INJURY AND ILLNESS REPORT

NAME Last: First Middle Initial

2. ADDRESS Number, Street, Town, State

SOCIAL SECURITY NUMBER 5. PHONE NUMBER

6. AGE 7. SEX

8. CLASSIFICATION (check one only):

- Female
- Male
- Other

DATE AND TIME OF OCCURRENCE

10. ACCIDENT LOCATION: Name of building, floor, building, university, etc.

If outside of building, give location in reference to nearest building, eg. on hill near of Davis Hall

Date Time AM

INSTRUCTOR (if applicable)

12. DEPARTMENT

13. WITNESS Phone and Phone Ext.

ACCIDENT DESCRIPTION: Describe fully, stating whether injured or exposed person struck, fell, etc., and all factors contributing to accident or illness.

[Space for description]

NATURE OF INJURY OR ILLNESS: Describe in detail the nature of the injury or occupational illness and the part of the body affected.

[Space for description]

EMERGENCY CARE AND PATIENT STATUS

- First Aid Only, not at hospital or by doctor
- Referred to hospital or medical personnel, current status unknown
- Treatment at hospital or by medical personnel
- Other specify

TREATED BY: Name and address of physician or hospital, if known

THIS REPORT PREPARED BY

Print Name Phone No Date

FOR OFFICE USE ONLY

Investigation Conducted: 1) YES 2) NO Date Time:

Comments:

[Space for comments]

Person Conducting Investigation: Date
## NEAR-MISS REPORT FORM

### NEAR-MISS REPORT

<table>
<thead>
<tr>
<th>1. Name of Person Involved (Last, First, Middle Initial)</th>
<th>2. Title of Person Involved</th>
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<tr>
<th>3. Name of Person Completing Form (Last, First, Middle Initial)</th>
<th>4. Title of Person Completing Form</th>
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<tr>
<th>5. Department</th>
<th>6. Contact Phone Number(s)</th>
<th>7. Witnesses (Name and Phone no.)</th>
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<tr>
<th>8. Date and Time of Incident</th>
<th>9. Near-Miss Location</th>
<th>Site of incident (Building, name, Room no., stairs, hallway, etc.). If outside of building, give location in reference to nearest building, eg. on main movable of Bilger Hall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Time</td>
<td>AM/FM</td>
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<tr>
<th>10. Near-Miss Description</th>
<th>Describe fully the protective measures being followed including all substances, equipment, and machinery being used which was related to the near-miss. Use additional sheets if necessary</th>
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<tr>
<th>11. Personal Protective Equipment (PPE) Used (If applicable)</th>
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<tr>
<th>12. Severity</th>
<th>Circle the level of severity which you feel could occur if such an incident involved (Example: high, moderate, substantial, high, danger, etc.)</th>
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<tbody>
<tr>
<td>HIGH</td>
<td>MEDIUM</td>
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<td>LOW</td>
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<tr>
<th>13. Probability</th>
<th>Circle the level of probability which you feel that a person or property may be exposed to in a similar situation and that required hazards or risks may be present or likely (Example: high, moderate, substantial, high, danger, etc.)</th>
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<tbody>
<tr>
<td>HIGH</td>
<td>MEDIUM</td>
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<td>LOW</td>
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<tr>
<th>14. Corrective Actions</th>
<th>What should or has been done to prevent recurrence of this incident? (Ex. employee training, change of procedures, purchasing of equipment, etc.)</th>
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<tr>
<th>15. Miscellaneous Information</th>
<th>Provide any other information or recommendations which you feel are pertinent to this incident</th>
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FIELDWORK SAFETY GUIDELINES

1.0 A CLIMATE OF CARE

The following guidelines focus on establishing a climate in which safety of University personnel has primacy, where faculty, staff and students know the policies, procedures and guidelines to help create safe practices. Principal Investigators (PIs) may elect to manage the risks involved with their fieldwork in a different manner to these guidelines, but alternative practices must provide at least equivalent or better level of safety.

There is no successful method of guaranteeing safety of personnel. These guidelines attempt to provide a framework in which it is customary and normal that all possible precautions have been taken and all proper responsibilities met. The major requirements-assessment of risk, planning, training, equipment, communication, responsibilities - are addressed in this document.

2.0 APPLICATION AND SCOPE

"Fieldwork" consists of activities authorized by the University, conducted for the purpose of study, research or teaching which are undertaken by faculty, staff, students, and authorized volunteers of the University at a location outside the geographical boundaries of the University campuses.

Fieldwork activities, such as those involving isolated or remote locations; extreme weather conditions; hazardous terrain; harmful wildlife; or lack of ready access to emergency services, can expose participants to significant risks to their health, safety or well-being, at locations outside the direct supervisory control of the University.

The intent of these guidelines is to ensure that prior to undertaking fieldwork:

a) all concerned parties are aware of their responsibilities;

b) a risk assessment is carried out to identify potential hazards associated with fieldwork and to establish appropriate controls to eliminate or minimize such hazards; and
c) all participants have an informed understanding of the associated risks and provide their consent to the means for dealing with such risks.

Under normal circumstances, these guidelines are not intended for organized off-campus activities such as:

→ Supervised study or work placements at external institutions which are affiliated with the University or which the University department has designated to be an approved placement center; or

→ Travel for conferences, seminars, meetings or visits to other institutions.

For all off-campus activities conducted on the premises of or under the control of another organization or institution, Principal Investigators (PAIS) must ensure that the local safety procedures of that organization or institution are appropriate to the type of activities being conducted, are in compliance with local laws and regulations, and are consistent with the safety standards and practices of the University of Hawaii.

3.0 RESPONSIBILITIES

The responsibilities of the following: 1) Deans, Directors and Department Chairs; 2) Departmental Safety Coordinators; 3) Principal Investigators/Supervisors; 4) Employees and Students and; 5) Environmental Health and Safety should be consistent with the responsibilities set forth in the University of Hawaii at Manoa Departmental Health and Safety Guide.

For the purpose of fieldwork, the following additional responsibilities are:

**Team Leader**

The Team Leader may be the Principal Investigator (PI) or may, in the absence of the PI, be another member of the team who has been designated as such by the PI. The Team Leader has the duties of a supervisor and in particular, the Team Leader is responsible for:

a) ensuring implementation of the controls established by the PI, including the use of appropriate safety equipment, safety procedures and medical precautions by team members during fieldwork;

b) conducting ongoing risk assessments during fieldwork and
reporting any new hazards to the PI;

c) dealing with and resolving any safety concerns which arise in the field;

d) maintaining regular contact with the PI and/or departmental contact;

e) informing the PI and/or departmental contact of all accidents, illnesses or emergencies which occur in the field; and

f) ensuring team member have received adequate health and safety training as applicable and must retain training records.

Team Members
Each member of the fieldwork is responsible for:

a) acknowledging the risks of the particular field project;

b) using the appropriate protective equipment provided and following the procedures established by the PI;

c) working safely and in a manner to prevent harm to themselves or to others;

d) understanding the Requirements for Reasonable Care outlined in Section 4;

e) reporting any identified hazards to the Team Leader or PI; and

f) reporting all accidents, illness or emergencies to the Team Leader.

4.0 REQUIREMENTS FOR REASONABLE CARE

Those involved in fieldwork must exercise reasonable care to ensure safety include, but are not restricted to, the following:

a) only staff, students, and approved volunteers authorized by the PI may assist with fieldwork. Friends, pets and children are prohibited from accompanying field teams. Employees of county, state and federal agencies on official business connected with the project may accompany people working in the field. Researchers or other colleagues from other institutions not authorized by the PI are not
allowed to accompany field teams. Always consult with your PI if you are uncertain regarding someone's eligibility to accompany you in the field.

b) availability of appropriate first-aid supplies and expertise; and accessibility to emergency medical treatment;

c) availability of appropriate personal protective equipment (PPE) and field equipment to support the research;

d) availability of appropriate food and accommodations, and during travel to and from the site;

e) arrangements of appropriate transportation to, at and returning from the location of the fieldwork; vehicles must be operated in a manner consistent with Standard Operating Procedures (SOPs) for vehicles for the agency whose vehicle you are driving. Personnel should ask the PI for a briefing on the procedures before you operate the vehicle for the first time;

f) prior to departure, and on a continuing basis on the site, the tasks and responsibilities assigned to each participant must be clearly communicated;

g) knowledge of all health and safety standards and requirements applicable to the jurisdiction in which the fieldwork is being conducted;

h) provision of appropriate information and training regarding the risks associated with fieldwork activities, materials, equipment and environment, and appropriate control measures for dealing with them;

i) provision of appropriate information and training for responding to and reporting of accidents involving injuries, damage to property and equipment, and spills, leaks or release of hazardous materials;

j) recognition of the right and responsibility of an individual to exercise personal judgement in acting to avoid harm in situations of apparent danger; in this regard, students should be informed of the general nature, requirements and location of their fieldwork; and

k) availability of procedures for contacting the University to obtain assistance in an emergency.
5.0 SOLITARY FIELDWORK
Working alone is strongly discouraged, particularly when remote or hazardous locations, high-risk activities or other unusual conditions are involved.

In situations where solitary work is deemed necessary and unavoidable, a stringent code of practice must be established to address worker competency, procedures for regular reporting, emergency procedures, and other precautions and procedures appropriate to the type of activities involved. In such situations, the Solitary Field Researcher will assume the responsibilities of Team Leader and Team Member. The field member must ensure that someone knows where he/she is and when he/she is expected to return.

6.0 REFUSAL OF UNSAFE WORK
Any individual member of a fieldwork team may refuse at any time to participate in any activity which they feel may endanger their health and safety or that of another person.

7.0 GENERAL GUIDELINES
Before fieldwork is conducted, the PI should develop standard operating procedures specific to their fieldwork. The SOPs should include at a minimum, information provided in sections 7.1, 7.2 and 9.0

7.1 Preparation - Before Individual(s) Leave
One of the most important phases of a fieldwork experience is planning and preparation before you leave. Here are some suggestions before a person leaves:

→ Prepare a written plan of the trip and leave this with a responsible party. Include the following:

a) Your itinerary: locations, arrival and departure dates, names, addresses and phone numbers of all fieldwork participants.

b) Contact person: Name and phone number of a person to contact in case of emergency.

c) Activities: General nature of activities being conducted.

d) Local contacts: Names of people at or near your fieldwork site who can reach you if necessary, as well as your check-in/check-out arrangements. Fieldworkers should check in with their group office regularly, and should advise the group office of any changes in
schedule or points of contact. If possible, fieldworkers should also inform someone in their work locale (for example, local search and rescue personnel, police, sheriff or motel employee) each day about the daily fieldwork location and the approximate time of return. The local contact should be provided with telephone numbers of people to call (group office, University contact, etc.) if the workers do not return or report in within a predetermined interval of the scheduled return time.

→ Learn about potentially hazardous plants, animals, terrain and weather conditions in the areas where fieldwork is being conducted.

→ Take a CPR/First Aid class.

→ Assemble safety equipment and other provisions and check everything before you leave; these include:
  
  • First aid kit and first aid manual
  • Medications taken on a regular basis
  • Allergy treatments as needed
  • Sunscreen and hat
  • Water purification tablets or filter devices
  • Personal protective equipment (PPE) such as safety glasses/goggles, gloves, hard hat, work boots, etc.)
  • Vehicle emergency kit
  • Flashlight
  • Flares
  • Two-way radio (if you will be working alone in an isolated or dangerous area) and/or cellular phone as appropriate

→ Whenever possible, fieldwork activities should be done in teams of at least two people. The "buddy" system is the safest way to work.

→ Ask your health insurance provider about how your coverage applies to medical treatment in the fieldwork locale, should that become necessary. Find out where you can go for emergency care.

→ Obtain authorization for access to state, federal and/or private lands.

→ Obtain permits for any sample collection from respective agencies (i.e. DLNR, NFWS, etc.)

7.2 Medical Care and First Aid

→ The first aid kit must be maintained at all times during the
operation or exercise. At least one employee who is trained in first aid must be present during operations. At least one field crew member shall carry a first aid kit while in the field. Additionally, each vehicle should carry a fully stocked first aid kit and a survival kit.

→ There shall be at least one (1) individual per field crew with a current standard first aid certificate.

7.3 Travel on Foot

→ Wear proper safety gear

→ Always carry a first aid kit, radio and water.

→ Be sure that equipment and supplies are carried in a manner consistent with safe travel over rough terrain. Backpacks should be in good repair and fit properly; DO NOT OVER-ESTIMATE YOUR LOAD CAPACITY.

→ Always be aware of what's around you (on ground and overhead).

→ Be conscious of surroundings - when disoriented, familiar objects can set you on track. Carry a compass and an area (field) map showing locations of pertinent transect, roads and trails, and other landmarks, especially in unfamiliar surroundings and/or when fog, rain, or darkness can set in.

→ Always be sure someone in the laboratory knows where you are and when you are expected to return.

→ Never overextend your capabilities.

→ Be sure permission is granted before entering private property.

→ Report accidents immediately to your supervisor.

→ Use common sense.

→ If you do get lost or become disoriented **STAY WHERE YOU ARE.** You may be overcome by panic. Sit down and quietly organize your thoughts on where you are. A few moments of recollection may clarify your situation. If not, find a comfortable place to rest. Use your whistle or other means to attract the attention of anyone around you. Do not try to leave the area if there are no signs of where to go. Do not follow a stream down hill; it will almost certainly go over a waterfall at some time. Do not travel at night. You can
sometimes assist a helicopter search by starting a smoky fire but be extremely careful not to set the surrounding vegetation on fire.

7. 4 Other Transportation

7.4.1 Use of Vehicles

Only licensed and appropriately trained drivers should be in charge of field vehicles. The PI should ensure that there is a system in place for checking for appropriate and current driving licenses and placing restrictions on use of vehicles, e.g. for untrained or inexperienced persons, and giving express permission for vehicle use. It is advisable for the PI to have guidelines on use and limitations of vehicles.

Only registered vehicles are to be used. Vehicles used for fieldwork should be well maintained according to the manufacturer's service specifications and equipped with adequate spare parts and tools, according to the area and length of trip. Care must be taken when loading vehicles to maintain as low a center of gravity as possible and to secure items adequately in a cabin. Vehicles must be driven with caution and attention to prevailing road and weather conditions.

The vehicle should be selected for the type of terrain likely to be encountered. Drivers should be familiar with the vehicle before setting out on the trip. Drivers intending to use four wheel drive (4WD) vehicles should have received training in 4WH or be able to demonstrate experience in driving such vehicles. Drivers should be familiar with routine maintenance procedures such as checking oil, water, tire pressure, coolant, and battery, and charging tires. Drivers should also be aware of the fuel capacity and range of the vehicle.

Prior to setting out on the trip, the driver should check the vehicle to ensure it has been adequately maintained and has all necessary tools, spare parts and special equipment for the trip. A check should be made that luggage and other equipment are secure.

Rest stops and fuel stops should be used to check that the vehicle is operating normally with respect to tire pressure, engine leaks, etc. and that luggage and equipment remain secure. Everyday, before setting out, check oil, water, fuel, battery fluid, coolant, brake fluid and tire pressures and that controls are working.
Driving times and distances should be planned to prevent fatigue. A driver should take periodic breaks after driving for a few hours. During the break some light physical activity such as walking should be incorporated. Driving at night is more hazardous than during daytime because of reduced visibility, and fatigue and should be minimized.

Drivers should always heed applicable road rules, including those pertaining to consumption of alcohol. Driving should always be done at safe and legal speeds. Safe speeds depend upon the road and weather conditions, experience of the driver, time of day, alertness of the driver and the vehicle itself. Unfamiliarity with the road or conditions and the presence of nocturnal animals contribute to driving hazards.

7.4.2 Use of Boats
When boats are used, the PI in charge must be familiar with relevant state and federal boating laws. Personnel in charge of boats are responsible for ensuring that the appropriate licenses and any appropriate boat registrations are obtained.

Boats should be well maintained and equipped with adequate spare parts and tools, according to the area worked and the length of the trip. Care must be taken when loading boats. The maximum capacity that the boat can carry must be displayed on the boat and must not be exceeded. Boats must contain adequate safety devices such as distress flares, personal flotation devices, etc.

Only licensed and appropriately trained personnel should be in charge of boats. Boats must be driven with caution and attention to prevailing conditions. Only those personnel necessary and trained for the fieldwork may be carried in boats. No one may go out boating alone.

Before setting out on boating trips, check prevailing and predicted weather conditions. Boat trips should not be undertaken in poor weather (e.g. high winds, rough seas) or when poor weather is predicted over the period of the planned trip. Even when good weather is predicted, changing weather should be anticipated in planning the trip.

Prior to setting out, check the vessel for safety equipment, personal flotation devices, fully charged battery, fuel, spare plugs, cotter pins, anchor and small bucket for bailing.
7.4.3 Helicopter Operations

→ All field personnel involved in work that requires use of helicopters must have completed a National Park Service B-1 Helicopter Safety Course within the last 3 years.

→ All field workers involved in sling-load helicopter operations must have also completed the appropriate course within the last 3 to 5 years.

→ Personnel may only fly Department of Interior Office of Aircraft Safety certified helicopters flown by OAS certified pilots.

→ For helicopter operations involving flight over the ocean, all persons involved must have had training in the ocean-ditching protocol within the last two years. Taking the course for two years in a row is recommended for new employees.

→ All personnel involved in any way with helicopter operations must use the appropriate Nomen flight suits, gloves, hard hats with chin straps or helmets, leather boots and other prescribed protective and safety clothing. Personnel flying a helicopter must wear appropriate fire-repellent clothing and communication helmet.

7.5 SCUBA Diving

Diving can only be authorized when done in accordance with the University of Hawaii Diving Safety Manual administered by the University's Diving Safety Officer. Before diving, the PI must contact the University's Diving Safety Officer to ensure the requirements set forth in the UH Diving Safety Manual can be met.

7.6 Use of Firearms

→ If your work requires you to carry a firearm you must have passed the federal firearms certification provided by the National Park Service or other federally approved program, e.g., N.R.A. This test must be repeated each year. You must obtain approval from the landowner to carry a firearm on their property.

→ You must abide by all state and federal laws.

→ Firearms must always be returned to the firearm's cache on returning from the field.
You must ensure that the firearm is properly maintained.

You must account for all ammunition used.

7.7 **Use of Pesticides/Other Chemicals**

If your work requires you to use pesticides, you must either work under the supervision of a person who has a certificate for pesticide application or have a current certificate yourself. You must abide by the instructions on the pesticide label.

You must wear the appropriate safety equipment and clothing at all times and are responsible for maintaining your equipment and clothing.

Know the requirements of the University's Chemical Hygiene Plan and/or Hazard Communication Program as it applies to your work; contact UH EHSO Chemical Hygiene Officer or Industrial Hygienist for these requirements.

In case of an accident, especially where you get chemicals on the skin, you must notify your supervisor immediately.

7.8 **Working In Water**

7.8.1 **Coastal and Estuarine Work**

When planning coastal and estuarine work, information about tides, currents, weather and other factors affecting safety must be considered. Work on rock-platforms can be particularly hazardous and adequate precautions must be taken to prevent anyone from being swept from rocks or injured by unexpected waves. Ensure that appropriate clothing, including footwear is worn by all personnel.

7.8.2 **Streams**

When working in streams, always be aware of the weather conditions, especially when heavy rains are forecast. Other precautions to consider are:

- Wear footwear appropriate for the tasks, e.g., rubber boots, tabis (i.e., those designed for wading). Do not jump from rock to rock. Always ensure that your footing is safe.

- If, after working in a stream or in some way associated with water, you come down with flu-like
symptoms that persist consult your physician and inform him/her that you may have been exposed to leptospirosis. If you have a break in your skin that could be exposed to water let your supervisor know so that protective measures can be taken or you can be assigned to other duties.

Never drink untreated water from streams or any source other than a municipal supply. If you suffer from diarrhea and have a hydrogen sulphide taste in your mouth after belching consult your doctor and inform him/her of the possibility or your having Giardiasis or amoebic dysentery or other waterborne diseases. If your doctor confirms that you are suffering any such disease you must notify your supervisor immediately. You will not be allowed to work in the field until your doctor has confirmed that you are free of the disease.

7.9 Terrestrial Fieldwork
Precautions required for terrestrial fieldwork vary according to the type of environment and likely weather conditions, including possible weather extremes which may be encountered. Rainforest, caves and mountain environments present different hazards. The PI should develop standard operating procedures (SOPs) for each type of terrestrial fieldwork it conducts. Fieldwork personnel should receive training on SOPs relevant to the environment being visited.

7.9.1 Working In Caves
Field personnel depending on the nature of their research, may from time to time need to enter cave systems to survey, monitor, sample or evaluate cultural and natural organisms and their habitats.

Caves in Hawaii occur primarily in volcanic substrates and consist of lava tubes or lava blisters that have formed in pahoehoe (smooth lava) flows. Tube widths can range from a few feet to thirty (30) feet and tubes or systems of tubes can extend up to several miles. Skylights or collapsed roof sections are common in tubes, which rarely extend intact for more than 100 m. All tubes and blisters that are entered by field researchers should be prehistoric and have long since attained a cooled, nontoxic and stable condition. Tubes near active volcanic structures, as on Big
Island should not be entered without special training. If there is any question about the safety of the tube, do not enter it. Do not enter a cave or tube if you are claustrophobic. Always file a Cave Work Plan with your supervisor/PI or local law enforcement.

A variety of animals may use caves. Honeybees and paper wasps may nest under overhangs at entrance. Move slowly and stay 10-15 feet away. Goats, sheep and pigs resting in caves may bolt for the entrance when startled and may dispute your right to stand in it, so approach a cave slowly.

Protocol for cave visits

General Concepts:

→ Treat caves with respect. Many are sacred places.

→ Move slowly and softly. Careless movement may damage irreplaceable archeological, geological or biological resources.

→ Do not move or remove cave material, except recent garbage. Do not dig as this may destroy stratified deposits. Do not change air flows as this may alter the cave's climate.

→ Do not smoke in the cave.

→ Do not leave anything in the cave.

→ Take extreme care in transition and deep (lightless) cave environments; do not touch mineral deposits, animals, organic ooze, cave slime or tree roots.

Procedures:

→ Approach cave entrances carefully and do not make a trail or trample vegetation. Avoid stepping on stone structures or plants.

→ Allow 10 to 15 minutes for your eyes to adjust to the cave.

→ Carry or wear the following (each cave): durable trousers, light jacket, shirt, hard hat, leather gloves and good quality walking shoes with reasonable ankle support and thick soles. Knee and elbow pads, if rough or confining conditions are expected.
Each person should have a whistle and at least one flashlight (at least two D or four C cell flashlights) plus an extra set of batteries. Chemical light sticks (Cyalumes) should be carried as backup because they provide several hours of illumination. There should be at least one strong, extra flashlight for each three people. Headlights should be used in preference to hand lamps. Carry one-quart of water and food snacks.

Each group should carry: 1) two-way radio; 2) compass; 3) flagging tape; 4) first aid kit 5) Insect sting kit; 6) navigation log book; 7) watch; 8) entrance-marker flag.

Never enter a cave alone. Minimum crew is two.

Leave a filled-out Cave Work Plan with a responsible individual. Plan should include who is in field party, vehicle use, location of cave (if known only on arrival, call in on radio to your supervisor/PI), date, planned times to depart and return to base camp, planned time inside cave and purpose of cave mission.

Mark cave entrance with visible flag before entering.

Never separate in the cave, stay within eyesight of one another.

Move slowly and stand up even slower. Watch for hazards overhead and underfoot.

7.10 Working on State or Federal Lands

If you are working in a national park, wildlife refuge or state forest reserve and there is an emergency, e.g., volcanic eruption, wildfire, you may be required to participate in emergency operations. Obey the incident commander or other responsible official. Participation in such emergencies is optional but you are encouraged to support the emergency operation. During the period of the emergency you will be covered under the emergency regulations.

7.11 Working With or Around Animals

Check with the UH EHSO, Biological Safety Office and the IACUC (Institutional Animal Care Use Committee) for additional approval and guidance when anticipating working with or around animals.

Rodents (rat and mice), cats and other animals are known to carry a variety of diseases, most of which have not been reported from Hawaii. There is a known risk of leptospirosis and murine typhus in
Hawaii. If you are working with animals or areas that may have been contaminated by their dropping, you are required to take the following precautions.

Exposure to body fluids:

If you may be exposed to body fluids from these animals during trapping, tagging, or removal you must take a variety of precautions. First, all direct contact with animals should be through barriers. Use protective bite-proof gloves with disposable gloves underneath, if you must handle live animals (this should be avoided except when absolutely required). Use non-allergic disposable gloves for handling carcasses. Dispose of gloves afterwards by enclosing in plastic bag, like a "ziploc" bag.

If you are not leaving the carcass in the field, place it in a sealed bag. If you are examining stomach samples or other body parts, use disposable gloves, use eye or lab glasses with side covering and a mask to prevent fluids from hitting your eyes, nose and mouth. Any contact with fluids on skin should be washed off with an antibacterial soap. Contact with eyes, nose or mouth should be washed out with saline solution (eyes) or regular water (mouth). Such examinations should take place in a well-vented room or outside. People who have suppressed immune systems or are pregnant should avoid close contacts with cats, alive or dead, because of the risk of toxoplasmosis.

Exposure to Airborne Disease:

If you are cleaning an enclosed area (cave, historical structure) with rodent, bat or cat dropping, **DO NOT** sweep it. Use disposable gloves if touching contaminated areas. The area should be mopped down with commercial chlorine bleach solution. The person doing the cleaning should wear gloves and respiratory protection. Similarly, any bedding from mouse or cat traps should be handled only in the open, not inside an enclosed area. The droppings may carry leptospirosis and other diseases, so they should be treated as potentially infectious and buried away from streams and watercourses or double-bagged and disposed of according to local regulations at sanitary landfills.

7.12 Pests
A number of pests may be encountered in fieldwork. Follow these general guidelines to prevent injury and illness:
→ Keep garbage in rodent-proof containers and stored away from your campsite or work area. Food crumbs and debris may attract insects and animals.

→ Thoroughly shake all clothing and bedding before use.

→ Do not camp or sleep near obvious animal nests or burrows.

→ Carefully look for pests before placing your hands, feet or body in areas where pests live or hide (e.g. wood piles, crevices, etc.)

→ Avoid contact with sick or dead animals.

→ Wear clothes made of tightly woven materials, and tuck pants into boots.

→ Wear insect repellent.

→ Minimize the amount of time you use lights after dark in your camp or work site, as they may attract pests and animals.

→ Use netting to keep pests away from food and people.

→ Carry a first aid manual and kit with you on any excursion so you can treat bites or stings. If the pest is poisonous or if the bite does not appear to heal properly seek medical attention immediately.

→ Be aware of the appearance and habitat of pests likely to be found.

7.13 Other Environmental Hazards
In addition to pests, other fieldwork exposures can be hazardous:

→ Poisonous Plants - plants like "poison oak" may contain a potent allergen that can cause a reaction anywhere from several hours to two (2) weeks after exposure. The allergen may spread by: contact with the plant itself, touching other objects which have touched a plant (tools, for example); inhaling smoke from burning plant; and/or touching other areas of the body after touching the plant.

To prevent exposure, learn to recognize and avoid the plant and wear clothing such as long pants and long-sleeved
shirts. If you come in contact with these plants, wash clothes and skin with soap and water as soon as possible.

→ Impure Water - A variety of potentially harmful organisms and pathogens can live in "natural" water sources such as streams, lakes and rivers. Drinking impure water can cause more than just gastrointestinal problems. Waterborne toxins can also cause hepatitis, giardia, and certain viral diseases. If you are not going to be near a municipal or treated water source, carry your own water. Never drink straight from a "natural" source. If you must use these sources, treat the water first by using water purification tablets, boiling it for three minutes, or using a special purification filter (available from sporting good stores)

→ Exposure to the Elements - Sunburn is a common and easily preventable hazard. Chronic exposure to the sun can increase one's risk of skin cancer. People differ in their susceptibility to sun due to their skin pigmentation. Certain drugs, such as sulfonamide, oral antibiotics, certain diuretics, most tetracycline, barbiturates, and biothionol (ingredient in soaps and many first aid creams) can also increase susceptibility to the sun. To prevent sunburn, cover exposed skin and liberally apply sunblock creams. Wearing a long-sleeved shirt and hat will also provide protection from the sun.

→ Heat Exhaustion - which can even affect individuals in excellent physical condition, is caused by prolonged physical exertion in a hot environment (such as strenuous hiking in the desert during the summer). Heat exhaustion symptoms include fatigue, excessive thirst, heavy sweating, and cool and clammy skin and are similar to shock symptoms. If these symptoms are present, cool the victim, treat for shock, and give water or electrolyte replacement slowly but steadily if the victim can drink. If heat exhaustion is not treated, the victim can suffer heat stroke. Heat stroke is far more serious than heat exhaustion. The blood vessels in the skin can become so dilated that the blood supply to the brain and other vital organs is reduced to inadequate levels, causing the individual to become exhausted and faint; the skin becomes bright red and very warm to touch. This is a potentially fatal condition that requires immediate attention. Cool the victim at once, in any way possible, replenish fluids as with heat exhaustion, and seek medical attention immediately. Failure to gradually acclimate to heat, or even
minor degrees of dehydration or salt deficiency make an individual more susceptible to heat exhaustion. To prevent heat exhaustion, drink plenty of liquids (electrolyte replacers) and take frequent rest breaks.

→ Excessive Cold- On any trip, even a one-day excursion, where sudden changes in weather can occur, adequate clothing must be worn or carried. Prolonged exposure to excessive cold can lead to hypothermia, a lowering of the body temperature; symptoms include shivering, numbness, slurred speech and excessive fatigue. Long pants, a long-sleeved shirt or sweater, a windbreaker or down jacket, and a cap are the minimal essentials. In cold or icy water, it is best to wear clothing made of material that will wick moisture away from the body (e.g. wool or poly-propylene instead of cotton). Wear several layers of clothing to allow adjustments to differing levels of physical activity. Avoid getting damp from perspiration.

8.0 EQUIPMENT AND COMMUNICATIONS

8.1 Equipment
Safety equipment used in the fuel must be inspected and/or tested prior to the trip to ensure that it is in good operating condition, with fully charged batteries, sufficient fuel and that all appropriate parts. Tools and manuals are available.

8.2 Special Safety Equipment
Depending on the type of work, the area to be visited and the likely weather conditions, special safety equipment may be required. This will include personal protective equipment (PPE) such as coveralls, proper footwear or boots, sunglasses, safety goggles, insect repellent, sunscreen, hats, wetsuit, gloves, respirators or personal flotation devices. Other suggested items include: water canteen, matches, whistles and flashlights.

Ensure that the equipment and material you need has been carefully thought about, made available and that everyone involved knows how to use it. If anyone in the group has specific medical conditions requiring medication, or has allergies to anything that may occur during the work, make sure someone else knows. The first aid officer should be made familiar with appropriate treatment for the condition.
8.3 **Communications Equipment**
Training and licensing are required for use of certain types of radios. Where these are the main form of communication, all members of the a fieldwork group must be trained and licensed in their use.

If cellular phones are to be used, everyone must know how to use them properly and must have access to the relevant contact numbers. Battery power for communication equipment should be sufficient to last beyond the expected duration of the fieldwork.

8.4 **Contacts and Continuity of Contact**
No trip may take place without there being properly informed and competent designated contacts both within the fieldwork team and at the University base.

Before setting out on fieldwork, the schedules and methods for maintaining contact with the University and/or other contacts must be established and understood by everyone involved. Contacts are the University and elsewhere must be informed about the location of the fieldwork, the expected duration of work, how to contact field personnel, the planned time of return and at what time subsequent to this an alarm will be raised.

For long fieldwork, arrangements must be made to make contact on a regular basis, such as daily, or some other regular interval if daily contact is impractical. The frequency of the regular contacts will depend on the length of the trip and where it is, how many personnel are involved and what sort of communication is actually available.

If a scheduled contact is not made, the contact at the University or home must be able to raise the alarm. If plans change, members of the fieldwork team should alert their designated contact to prevent false alarms and waste of time.

Before any trip, contacts and members of the field team must have agreed how an alarm would be given under any worst case scenario (e.g. the boat sinks, a vehicle fire) when the planned means of communication is no longer feasible. If it is appropriate to organize alternative means of communication this should then be conducted.

The University campus security telephone number (956-6911), which is monitored 24 hours a day, should be displayed in all vehicles and can be used as a last resort should other University-based contacts fail.
9.0 **EMERGENCY PLAN**
Contacts at the University, at home and/or at location near to the fieldwork should be notified of the intended route(s), timing and number of people involved in the work, etc., so that they can provide the information and help to direct search and rescue attempts. Maps and plans showing the locations of work should be provided to PAIS or designated contact person.

Anyone designated as the contact person for a particular fieldwork must be organized and know exactly what is required. Schedules for contact, the timing and method of raising alarms if contact is not made, the circumstances of the work (e.g. the registration numbers of vehicles, or boats, the place where boats are to be launched) should be documented so that the contact can find them quickly if required.

No designated contact may pass on the responsibility simply by leaving a message for someone else to take over - if something changes, the new contact must be told personally and all the relevant information provided so that there is no break in the continuity of contact. The fieldwork team leader must also be informed of the change of contact person.

Suggested SOP for emergencies may follow the following:

a) Contact person initiates the emergency alert, if fieldwork team fails to return when scheduled. The response may involve the following steps:
   - Call 911, give your name, location of emergency, type of emergency and type of help required.
   - Notify any supervisory personnel and provide them with the same information. If you are working in a national park or wildlife refuge notify the local manager.

b) Thirty (30) minutes from call-in time, an alert is issued. Contact person or another person should stay near the phone at the fieldworker’s office or lab.

c) One hour from call-in time, search procedures should begin.

d) One person should remain near the phone, and one person familiar with the field area should begin tracking the scheduled route.

e) Tracking person should call back to the lab/office every 20 minutes to see if field worker has made contact.

f) Tracking continues until the person is found or word is received that she/he is safe.
ACKNOWLEDGEMENT OF RESPONSIBILITIES

Please detach and return to supervisor/PI (to be kept for his/her file):

I have read and fully understand the standard operating procedures for working in the field. I agree to comply with these procedures at all times. Furthermore, I understand that if I endanger my own or a colleague's safety I will be subject to disciplinary action, including the possibility of termination of employment.

________________________________________________________________________

Employee's Signature       Date
INSPECTION/COMPLIANCE FLOW CHART FOR WORKPLACE SAFETY COMMITTEE
Revised 10/20/00

1. Initial Inspection conducted by the Environmental Health & Safety Office (EHSO)

2. Report generated to PI or Supervisor. Copies to Department Chair and Dean. Issue response date in report.

3. No response from PI by response date

4. Unsatisfactory response

5. Notice sent to Dean/Director for follow-up

6. Satisfactory response

7. No further action needed. Reports sent to PI/Supervisor, Department Chairperson, Dean/Director and if applicable, the Chancellor

8. Un satisfactory response

9. Matter referred to Dean/Director for further action via formal letter by WSC Copy to the Chancellor