

Harper College

Environmental Health & Safety Procedure Manual

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SECTION 1–IMPLEMENTING THE PROGRAM

- 1.1 Purpose of the Manual**
- 1.2 Introduction**
- 1.3 Principles and Goals**
- 1.4 Assignment of Responsibility**
- 1.5 Facilities Committee**

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1.1 PURPOSE OF THE MANUAL

This *Environmental Health and Safety Procedure Manual (EH&S Manual)* outlines procedures, rules and regulations governing health, safety and environmental protection in which to follow while working at Harper College. The *EH&S Manual* is maintained by the Manager of Environmental Health & Safety (Sara Gibson x6923 or sgibson@harpercollege.edu), who is in the Physical Plant Department. Questions or concerns regarding the EH&S Manual should be directed to her. *The EH&S Manual* will be revised as necessary to add requirements and procedures involving newly identified exposures. Periodically, material in this manual will be updated, revised or supplemented in order to keep the manual current and relevant.

For **emergency** procedures see the Harper College *Emergency Procedure Manual* (orange flipchart).

It is impossible to effectively deal with all safety concerns or procedures in a single manual. Many safety related matters involve situation-specific factors, which are difficult to anticipate. Accordingly, this manual is not the definitive statement, or the only statement, on college safety concerns or procedures. This manual is a starting point and a good-faith attempt to create a viable, college-wide, safety program and philosophy.



1.2 INTRODUCTION

A. Purpose

This procedure is established to provide Harper College with a manual on Environmental Health and Safety (EH&S) in accordance with the *William Rainey Harper College Board of Trustees Policy Manual* Section 13.23.00 Environmental Health.

13.23.0 Environmental Health

Harper College shall provide a safe educational and working environment in compliance with appropriate health and safety standards and legal requirements. Harper College students, employees and visitors are entitled to:

- A. Work under safe and healthful conditions, free of recognized hazards
- B. Wear and use personal protective clothing and equipment
- C. Have basic, and when necessary, specific health and safety training.

The College shall develop, implement and administer a comprehensive safety and risk management program to address potential injury and loss.

To ensure such an environment, specific procedures, rules and regulations will be published in the *Environmental Health and Safety Procedure Manual*.

B. General Information

The manual contains programs and requirements for environmental health, safety and loss control program within the College and also outside the College to the extent the program involves communication and/or interaction with Harper employees, students, outside contractors, government agencies, and the public.

The programs and requirements are in accordance with Illinois Compiled Statutes Employment Health and Safety Act 820 ILCS 225, which adopts the US Occupational Safety and Health Administration (OSHA) Act of 1970, Illinois Environmental Protection Agency (IEPA) Act, and all local regulations.

Some program areas will require customized programs that pertain to the hazards in a particular area or department. These customized programs shall be incorporated into this *EH&S Manual* as part of a department's specific program.



1.3 PRINCIPLES AND GOALS

An effective occupational, health and safety program will be maintained. The college in keeping with these principles and goals will provide qualified personnel and adequate facilities and equipment. The following principles are fundamental to a successful operation:

A. Fundamental Principles

- Appropriate programs shall be implemented to protect employee, student, and visitor health and safety.
- Occupational injuries and illnesses are preventable.
- Administration seeks to define, initiate and maintain programs and procedures to prevent injuries and illnesses.
- Continuing scrutiny of programs and ongoing employee training and education in occupational health and safety are essential program elements.

B. Goals

- Minimize health and safety risks by providing safe and healthful work environments, preventing unsafe acts and controlling exposures to health and safety hazards in the workplace.
- Provide and assure appropriate health and safety programs exist and are in place.
- Control health hazards in the workplace and assure that employees are informed of hazards and how to protect themselves from overexposure.
- Assure all administrators, managers, employees, and students have received orientation, instruction and training in health, safety and environmental protection matters.
- Require that all health, safety, environmental protection and loss control practices, standards, laws and regulations be observed relating to people, facilities, materials, processes, wastes and the environment.



1.4 ASSIGNMENT OF RESPONSIBILITY

All employees and students are responsible for compliance with the *Environmental Health & Safety Procedure Manual (EH&S Manual)* and associated programs. Each individual is accountable for his or her own activities, as well as those occurring under their operational control. The following is a non-inclusive list identifying responsibility and accountability for environmental health and safety issues:

A. President (*Dr. Robert Breuder*)

- Overall responsibility for establishing and maintaining environmental health and safety programs for the College.
- Provide the leadership, procedures and funding necessary to ensure a safe and healthful environment for the College.

B. Administrators (*Vice Presidents, Deans, Directors and Dept. Heads*)

- Provide facilities and equipment required for a safe work environment.
- Ensure individuals under their management have the authority and support to implement health and safety procedures, practices and programs.
- Ensure areas under their management are in compliance with the College health and safety procedures and programs.
- Establish priorities and commit resources for correction of safety deficiencies.
- Establish procedures for dissemination of safety- related information.
- Establish procedures for implementation of *EH&S Manual* and associated programs.
- Establish a system for assessing safety performance.

C. Managers and Supervisors

- Provide safe and healthy environments for those areas and personnel for whom they have supervisory or administrative responsibility, incorporating safety and health issues as an integral part of all activities at the College.
- Assure completion of training requirements as required in the *EH&S Manual* as well as other training needed to perform the job safely and maintain all training documentation.
- Initiate and enforce necessary preventive measures to control hazards.
- Report injuries and illnesses to Health and Psychological Services.
- Review accident and injury reports for their area(s).
- Serve as a focal point for safety and health concerns.



D. Faculty and Staff

- Participate in mandated training programs provided by supervisors and other instructors.
- Perform activities as trained.
- Promptly reporting safety, fire, and health hazards, environmental deficiencies, as well as injuries and illnesses to the supervisor or program director.
- Give due consideration to personal safety and the safety of others while performing tasks.

E. Manager, Environmental Health & Safety (Sara Gibson x6923)

- Assist all of the College community in the evaluation, planning, development and execution of health and safety programs. Establishing programs to assure applicable health and safety standards, as well as College policies and procedures, are followed. In the absence of appropriate statutes and governmental regulations, the published standards of recognized professional health and safety organizations will serve as guides.
- Maintain, review and update the *Environmental Health & Safety Procedure Manual*.
- Provide safety and health related technical services.
- Provide training materials, assistance, and programs in safe and healthy work practices.
- Review legislation, recommending procedures, and monitoring compliance with environmental, health and safety statutes and regulations and College health and safety procedures and programs.
- Provide guidance and technical assistance to the College in identifying, evaluating, and correcting health and safety hazards.

F. Facilities Committee

- To identify areas which affect the safety and appearance of the College and/or which limit accessibility to the College.
- To recommend appropriate action to correct deficiencies affecting safety, appearance and accessibility.
- To communicate concerns and corrective measures to the Harper Community.
- Review and/or recommend the adoption of emergency, environmental health and safety procedures.

G. Students

- While students are not covered under the provisions of the Illinois Department of Labor (IDOL) or the Occupational Safety and Health Administration (OSHA), students should be made aware of health and safety hazards in classroom situations and should be provided with information and equipment to protect themselves from those hazards. Faculty should provide student training at the beginning of each course in which hazards may be encountered. Special safety instructions should be provided at the beginning of each class period.



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H. Outside Contractors and Guests

- Outside contractors and guests should be informed of the environmental health and safety hazards they may come into contact with while on campus. They are also responsible for acting in accordance with the EH&S Manual.



1.5 FACILITIES COMMITTEE

A. Purpose

To monitor the physical environment of the College which affects the accessibility, safety and the appearance of the College.

B. Objectives

- To identify areas which affect the safety and appearance of the College and/or which limit accessibility to the College.
- To communicate concerns and corrective measures to the Harper community.
- To recommend and aid in ongoing development of procedures and policies for emergencies and environmental health and safety.

C. Membership

- Thirteen (13) Committee Members
- Two (2) Faculty at Large
- One (1) Science Faculty
- One (1) Student
- One (1) Harper Police/ICOPS Representative
- One (1) IEA/NEA
- Two (2) Pro-Tech
- One (1) Classified or Supervisory-Confidential Staff
- One (1) Facilities Manager (By Position)
- One (1) Director of Physical Plant (By Position)
- One (1) ADA Compliance Officer (By Position)
- One (1) Manager, Environmental Health & Safety (By Position)

Term of Service: Two (2) years

Officers: Chairperson and Secretary to be elected by committee during the spring term for the following academic year.

C. Reports and Records

Committee Action Reports (CAR) for each semester and Annual Reports (ANN) shall be sent to the College Assembly Chair and the Learning Resource Center Archives. Annual Report (ANN) shall be submitted by May 15. A procedure notebook with committee history and minutes shall be maintained and given to each new chairperson. All reports shall be distributed to the Vice Presidents, College Assembly Chair, and the Faculty Senate President.

D. Decision Making

Recommendations requiring Presidential approval shall be forwarded by the Chair of the College Assembly on the Proposal and Recommendation (PAR) form.



SECTION 2–RECORD KEEPING

2.1 Record Keeping

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2.1 RECORD KEEPING

A. Objective

To provide guidelines for record keeping practices.

B. Scope

All records mandated by Federal, State and Local Laws.

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910 Subpart C, Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Responsibilities

Administration will maintain the following records for the time duration required by state and federal statutes.

E. Procedures

- **Department Training Records**

Managers/Supervisors shall document training for the employees that they oversee. The documentation shall include the type of training, date of training, topics covered and the name of the instructor.

Initial training shall be kept for the term of their employment. Refresher training shall be kept for the most current training, for a minimum of one year.

- **Medical Records**

The College's Health and Psychological Services Department shall keep required employee medical records for the term of employment, plus a minimum of 30 years.

- **Human Resources Records**

The Human Resources Department shall maintain copies of the OSHA 300 log for 5 years.

The OSHA 300 log for each year will be posted near Human Resources for 30 days beginning February 1 of the following year.

- **Compliance and Environmental Records**

The Manager of Environmental Health & Safety will keep environmental test results for 30 years.

Inspection and maintenance records shall be maintained for 3 years.



SECTION 3—EMPLOYEE INVOLVEMENT

- 3.1 Employee Orientation**
- 3.2 Employee Training**
- 3.3 Employee Safety Communication**
- 3.4 Safety and Health Rules**
- 3.5 Disciplinary Procedures**

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3.1 EMPLOYEE ORIENTATION

A. Objective

To assure that all new employees receive necessary orientation information.

B. Scope

All new employees.

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Responsibility

- The Manager/Supervisor shall be responsible for assuring required training is conducted.
- Manager/Supervisor will review the orientation checklist or something similar, which becomes a permanent personnel document kept by the Department.
- The employee should sign and date the training and orientation checklists.

E. Procedure

Inform the employee of the following:

- Required personal protective equipment and where and when it is to be used.
- General hazards and hazards specific to the job assigned.
- Safety rules.
- Hazard Communication Program.
- Incident / Injury Management Procedures.



3.2 EMPLOYEE ORIENTATION CHECKLIST

EMPLOYEE _____ DEPARTMENT _____
DATE HIRED _____ SUPERVISOR _____
DATE REVIEWED _____

1. Reviewed Environmental Health & Safety Procedure Manual. _____
2. Reviewed Emergency Procedures (orange flipchart) _____
3. Reviewed Safety Rules for the department. _____
4. Reviewed injury reporting procedures _____
5. Reviewed personal protective equipment and use _____
6. Reviewed lockout/tagout procedure _____
7. Reviewed safe lifting techniques _____
8. Reviewed housekeeping procedures _____
9. Reviewed hazard communication program _____
10. Reviewed specific job hazards _____
11. Reviewed disciplinary program _____
12. Reviewed evacuation procedures, meeting location and duties _____
13. Ergonomics program _____
14. Other _____

I acknowledge that information on the above subjects was furnished to me during my orientation.

EMPLOYEE'S SIGNATURE

_____ DATE _____

I have instructed the above named employee in the fundamentals of safety practices.

MANAGER'S/SUPERVISOR'S SIGNATURE

_____ DATE _____

Retain a copy in the employee's departmental file.



3.3 EMPLOYEE TRAINING

A. Objective

To provide required training to all employees

B. Scope

All affected employees and students.

C. References

Department of Labor, Occupational Health and Safety Administration -Occupational Safety and Health Act of 1970 Section 5(a) (2), Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Responsibility

- Manager of Environmental Health & Safety shall assure that appropriate training material is provided to the Department Head.
- Supervisor/Manager shall assure appropriate training is conducted. Signed documentation shall be maintained in the employee's department file.
- Documentation shall consist of, specifically what was taught, who attended and who taught. All attendees and the instructor shall sign and date the form.

E. Training Topics (A partial listing) and Required Frequency

- Specific Job Hazards (*required initial training*)
- Environmental Health & Safety Procedure Manual
 - Section 1-4 Intro. (*initial training for everyone*)
 - Section 5- Incident/Injury Management (*initial training for everyone*)
 - Section 6 – Personal Protective Equipment (PPE) (*initial training for applicable employees*)
 - Hearing Conservation (*annual training for applicable employees*)
 - Section 7 – Hazard Communication (*initial training for applicable employees*)
 - Section 8- Laboratory Chemical Hygiene Plan (*initial training for applicable employees*)
 - Section 9 – Confined Spaces (*initial training for applicable employees*)
 - Section 10- Electrical Safety including Lock-out/Tag-out (*initial training for applicable employees*)
 - Section 11- Powered Industrial Trucks (*initial training for applicable employees and every 3 years hands-on re-evaluation*)
 - Section 12- Bloodborne Pathogens (*annual training for applicable employees*)
 - Section 13- Ergonomics (*initial training for applicable employees*)
 - Section 16- Asbestos Management (*initial training for applicable employees*)
 - Section 20- Walking-Working Surfaces
 - Fall Protection (*initial training for applicable employees*)
 - Ladder Safety (*initial training for applicable employees*)
 - Aerial Lift (*initial training for applicable employees*)



F. Documentation

- Date.
- Location (building, room, floor, etc.) where the meeting was held.
- Time it started and ended.
- A listing of topics reviewed or discussed.
- The instructor (for each topic if more than one instructor was involved).
- The name of each person attending, as well as those required to receive the training involved who were not present shall be documented.
- A list of all matters that were found to require some type of follow-up or further action (This includes the training of those who were unable to attend.).
- The source document or audio-visual presentation, if one should be identified.

G. Sources of Training Materials and Information

- Harper College Environmental Health & Safety Procedure Manual (EH&S Manual)
- Federal Occupational Safety and Health Administration (OSHA)
- National Institute of Occupational Safety and Health (NIOSH)
- Insurance Carrier
- National Safety Council
- National Fire Protection Association
- American Society of Safety Engineers
- American National Standards Institute



3.4 EMPLOYEE SAFETY COMMUNICATIONS

A. Objective

To establish a flow of information designed to benefit the employees, students and the college in matters of safety and health.

B. Scope

All suggestions addressing issues relating to safety and health.

C. Responsibility

Manager, Environmental Health & Safety shall administer the program.

D. Procedures

- Suggestions relating to safety and health issues from the Harper community shall be submitted to the Facilities Committee or the Manager, Environmental Health & Safety.
- The Facilities Committee will review the suggestion.
- Committee recommendations shall be forwarded to the appropriate department or to the Assembly Committee.
- Facility Committee shall inform the employees on the status of suggestions.
- The Manager, Environmental Health & Safety shall maintain a record of suggestions, responses and action taken.



3.5 SAFETY AND HEALTH RULES

A. Objective

To provide guidelines for the establishment of a safe and healthful work environment.

B. Scope

Applies to all employees and students.

C. Responsibilities

- All members of the Harper community shall abide by safety, health and environmental rules.
- Management personnel shall fairly and consistently enforce and follow safety, health and environmental rules.
- Employees shall report any infractions of these safety, health and environmental rules to management.
- Violations may be subject to disciplinary action.



CODE OF SAFE PRACTICES

1. All persons shall follow these safe practices rules, render every possible aid to safe operations, and report all unsafe conditions or practices to the management.
2. Supervisors shall insist on employees observing and obeying every rule, regulation, and order as is necessary to the safe conduct of the work, and shall take such action as is necessary to obtain observance.
3. Horseplay, scuffling, and other acts which tend to have an adverse influence on the safety or well being of the employees shall be prohibited.
4. Work shall be well planned and supervised to prevent injuries in the handling of materials and in working together with equipment.
5. No one shall knowingly be permitted or required to work while the employee's ability or alertness is so impaired by fatigue, illness, or other causes that it might unnecessarily expose the employee or others to injury.
6. Employees shall not enter voids, chambers, tanks, or other similar places that receive little ventilation, unless it has been determined that it is safe to enter (See Section 9 for more information).
7. Employees shall be instructed to ensure that all guards and other protective devices are in proper places and adjusted, and shall report deficiencies promptly. (See Section 21 for more information)
8. Workers shall not handle or tamper with any electrical equipment, machinery, or air or water lines in a manner not within the scope of their duties. (See Section 10 for more information)
9. All injuries shall be reported promptly to the supervisor so that arrangements can be made for medical or first aid treatment. (See Section 5 for more information)
10. When lifting heavy objects, the large muscles of the leg instead of the smaller muscles of the back shall be used.
11. Materials, tools, or other objects shall not be thrown from buildings or structures until proper precautions are taken to protect others from the falling objects.
12. Employees shall cleanse thoroughly after handling hazardous substances, and follow special instructions for those products.
13. Before leaving any job, be sure it is in a safe condition.
14. Work shall be so arranged that employees are able to face ladder and use both hands while climbing. (See Section 19 for more information)
15. Gasoline shall not be used for cleaning purposes.
16. No burning, welding, or other source of ignition shall be applied to any enclosed tank or vessel, even if there are some openings, until it has first been determined that no possibility of explosion exists, and authority for the work is obtained from their supervisor. (See Section 23 for more information.)
17. Any damage to scaffolds or other supporting structures shall be immediately reported to the supervisor and repaired before use.



MISCELLANEOUS

1. Use the proper ladder for the job you are doing. (See Section 20 for more information)
2. Do not use ladders with broken or missing steps or rungs and report any unsafe ladders to your supervisor. (See Section 20 for more information)
3. Never place a ladder on boxes or other unstable bases to gain height. (See Section 20 for more information)
4. Always place your ladder so that the side rails have secure footing. (See Section 20 for more information)
5. Do not climb higher than the third rung from the top on straight ladders, nor the second tread from the top of stepladders. (See Section 20 for more information)
6. When using flammable chemicals remember absolutely no smoking in the immediate area.
7. Check with your supervisor for the proper protective clothing or personal protective equipment. (See Section 6 for more information)
8. Make sure that you follow all safety precautions on the MSDS and Environmental regulations when using any chemicals. (See Section 7 for more information)
9. After handling any chemicals be sure to wash thoroughly before eating, drinking, smoking and/or applying cosmetics.

USE OF TOOLS AND EQUIPMENT

1. All tools and equipment shall be maintained in good condition.
2. Damaged tools or equipment shall be removed from service and tagged "**DEFECTIVE**".
3. Only appropriate tools shall be used for the job.
4. A screwdriver shall not be used as a chisel.
5. Do not remove guards from portable grinding tools or break off ground leads on portable electric tool plugs.
6. Portable electric tools shall not be lifted or lowered by means of the power cord. Ropes shall be used.
7. Electric cords shall not be exposed to damage from vehicle traffic.



OFFICE SAFETY

1. When using file cabinets, never open more than one drawer at a time to avoid tipping.
2. Desk drawers, filing, and storage cabinets must be kept closed when not in use.
3. Floors, work areas, and hallways shall be kept cleared of boxes, papers, electric cords, and telephone wires.
4. Chairs shall be kept in a safe condition (properly adjusted, wheels secured, etc.).
5. Inspect electrical wires periodically to be sure that plugs and/or cords are in safe operating condition.
6. Good housekeeping shall be maintained at all times. All spills, whether water, chemicals, grease, oil, or ink, will be quickly cleaned up.
7. Always think Safety Awareness.
8. Refrain from horseplay that could endanger you or your fellow employees.
9. Always maintain adequate lighting and ventilation.
10. When stocking shelves, refrain from placing heavy, bulky objects more than waist high. Ask for assistance when receiving, transporting, and stocking heavy packages.
11. Be sure that all electrical equipment is turned off at the end of the day.
12. During meetings, seating arrangements must include exit aisles not less than 24 inches wide, and these aisles must be kept cleared at all times.
13. Materials kept in binders shall be limited to a proper quantity that is reasonable with which to work.
14. Exercise care when using cutting devices.
15. Bookshelves and cabinets will be substantially braced to prevent them from tipping or falling.
16. Be sure that storage boxes are placed in out-of-the-way areas and are stored in a safe manner.
17. When using ladders or short steps never stand on the top step or the 1st (first) step down from the top, unless there are handrails on the ladder for the purpose of supporting you. (See Section 20 for more information.)
18. Make sure you use handcarts and other mechanical stock handling equipment when moving heavy loads.
19. Make sure that you follow procedures established for spill cleanup involving chemical substances (See Section 15 for more information).
20. Consult with the Material Safety Data Sheets (MSDS) if you do not know the hazards associated with a particular chemical spill (See Section 7 for more information.).
21. Ensure proper Video Display Terminal (VDT) or computer workstation arrangement for comfortable seating and distance from the terminal screen (See Section 13 for more information.).



3.6 DISCIPLINARY PROCEDURES

A. Objective

To provide guidelines for enforcement of safety rules, procedures and directives from appropriate management personnel.

B. Scope

All employees.

C. Responsibilities

- Employees will be subject to appropriate disciplinary action for violations of safety rules.
- Employee shall be afforded instructive counseling and/or training to assure a clear understanding of the infraction and the proper conduct under college guidelines.
- Supervisors should refer to the appropriate employment contract or *Employee Procedure Manual* for disciplinary procedures.
- However, nothing in this *EH&S Manual*, will preclude management from disciplinary action up to and including termination of an employee for a safety violation.



SECTION 4–EMERGENCY PREPARDNESS

- 4.1 Emergency Procedures
- 4.2 Emergency Operations Plan (EOP)

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4.1 EMERGENCY PROCEDURES

A. Objective

To minimize loss of life, and property damage in the event of an emergency.

B. Scope

All persons on site.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910.38, Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Procedure

- Refer to the *Emergency Procedures (orange flipchart)* for general information on all the following emergency procedures:
 - Life Threatening Injuries
 - Non-Life Threatening Injuries
 - Fire Emergencies
 - Bomb Threat
 - Tornado
 - Severe Weather
 - Workplace Violence
 - Response to Potentially Violent Criminal Behavior
 - Utilities Failure
 - Evacuation Plan
 - Evacuation of Persons with Disabilities
- As part of the *Emergency Procedures* departments shall have individual plans for evacuation with procedures and meeting locations.
- For additional information on emergency procedures contact Harper Police.

E. Emergency Information

- Departments shall have emergency contact names and phone numbers.
- For Life Threatening Emergencies (chest pain, uncontrolled bleeding, loss of breathing, severe head injuries) dial 911 and give the following information:
 - Your name
 - The nature of the emergency – life threatening injury, fire, chemical spill, etc.
 - The location: Harper College, 1200 W. Algonquin Rd, building, floor and room number.
 - Do not hang up until told to do so.
- For Non-Life Threatening Emergencies (twisted ankle, back pain, minor cut, debris or dust in the eye) proceed to Health & Psychological Services (HPS), A362 ext. 6268.



- After HPS hours, employees should proceed to St. Alexius Medical Center, 1555 N. Barrington Rd. Students should be referred to their own physician for treatment.

F. Building Evacuation

Upon hearing the fire alarm or announcement, begin evacuation procedures:

- Keep yourself and others calm.
- Quickly proceed outside the building to your department/areas designated meeting location using the planned evacuation route.
- Close windows and doors as you leave.
- Help those that need special assistance. *(Have a plan for assisting disabled persons in the department. See the procedure for evacuation of persons with disabilities in the orange emergency flipchart.)*
- Wait for instructions from emergency response personnel. Do not re-enter the building until told it is safe to do so.

G. Building Safety Systems

Locate the emergency equipment in your area and know how to use it.

- **Fire Alarms** – The fire alarm system in the building is activated by manual pull stations, smoke or heat detectors or the activation of the sprinkler system. All alarms are immediately sent to Harper Police and the fire department is called. Evacuation is required anytime the fire alarm system sounds.
 - **Manual Alarm pull stations** – Pull down to activate evacuation alarm. This will sound an alarm and immediately send an alarm signal to Harper Police. After activating the alarm call Harper Police, from a safe location, to provide additional information. Never block or obstruct these with furniture or equipment.
 - **Smoke and heat detectors** – This will immediately activate the fire alarm system.
 - **Fire Doors-** Must be kept shut at all times to provide a safe means of egress in stairways and corridors, unless releasing devices close doors upon alarm activation.
 - **Automatic Sprinkler System** – This will begin the extinguishment of the fire and immediately send an alarm to Harper Police. Individual sprinkler heads will open only where the temperature reaches the prescribed setting. It is important that at least 18” of clearance be kept at all times below the line of sprinklers to allow proper water distribution over the fire. Sprinklers must never be painted and should be protected from being struck and damaged or broken off. Leaks or other problems with the automatic sprinkler system should be reported promptly to Physical Plant.



- **Fire Extinguishers** – Only trained personnel should use fire extinguishers. Always notify Harper Police, from a safe location, after using a fire extinguisher. Never block or obstruct extinguishers with furniture or equipment.
- **Emergency Lighting** – This will aid in the evacuation in areas of corridors and stairways. A flashlight is recommended to aid in emergencies.
- **Automatic External Defibrillator (AED)** –A device capable of safely and easily delivering an electrical shock to restore the heart's normal rhythm. AEDs are strategically located across campus in 9 locations. Only trained personnel should use the AEDs. Contact Health & Psychological Services (x6268) for training.



4.2 EMERGENCY OPERATIONS PLAN (EOP)

A. Objective

To minimize loss of life, and property damage in the event of a **large** scale catastrophe.

B. Scope

To establish a comprehensive emergency plan to respond to large scale catastrophes (**levels 4-1 – see below**) requiring outside assistance and recovery from such catastrophes.

C. Procedure

- Harper Police maintain the EOP and update it regularly.
- Drills and tabletop exercises are conducted to ensure the EOP is effective.
- The EOP is National Incident Management System (NIMS) compliant to work with all other responding agencies and to respond to all types of emergencies.
- The following are levels of response:
 - **Type 5 Incident**
 - The incident can be handled by one or two single resources with up to six personnel
 - Command and General Staff positions (other than the Campus Incident Commander) are not activated
 - No written Incident Action Plan is required
 - The incident is contained within the first operational period and often within an hour to a few hours after resources arrive on the scene
 - **Type 4 Incident**
 - Command Staff and General Staff functions are activated only if needed
 - Several resources are required to mitigate the incident, including a Task Force or Strike Team
 - The incident is usually limited to one operational period in the control phase
 - The agency administrator may have briefings, and ensure the complexity analysis and delegation of authority are updated
 - No written Incident Action Plan (IAP) is required, but a documented operational briefing will be completed for all incoming resources
 - The role of the agency administrator/official includes operational plans, including objectives and priorities
 - **Type 3 Incident**



- When capabilities exceed initial attack, the appropriate ICS positions should be added to match the complexity of the incident
 - Some or all of the Command Staff and General Staff positions may be activated, as well as Division/Group Supervisor and/or Unit Leader level positions
 - A Type 3 Incident Management Team (IMT) or Campus Incident Command organization manages initial action incidents with a significant number of resources, an extended attack incident until containment/control is achieved, or an expanding incident until transition to a Type 1 or Type 2 team
 - The incident may extend into multiple operational periods
 - A written IAP may be required for each operational period
- **Type 2 Incident**
 - A Type 2 incident may require the response of resources out of area, including regional and/or national resources to effectively manage the operations and command and general staffing
 - Most or all of the Command Staff and General Staff positions are filled
 - Operations personnel normally do not exceed 200 per operational period and total incident personnel do not exceed 500 (guidelines only)
 - Many of the functional units are needed and staffed
 - The incident extends beyond the capabilities for local control and the incident is expected to go into multiple operational periods
 - A written IAP is required for each operational period
 - The agency administrator/official is responsible for the incident complexity analysis, agency administrator briefings, and written delegation of authority
- **Type 1 Incident**
 - This type of incident is the most complex, requiring national resources to safely and effectively manage and operate
 - All Command and General Staff positions are activated
 - Operations personnel often exceed 500 per operational period and total personnel will usually exceed 1,000
 - Branches need to be established
 - The agency administrator/official will have briefings, and ensure that the complexity analysis and delegation of authority are updated
 - There is a high impact on the local jurisdiction, requiring additional staff for office administrative and support functions
- Harper Police will determine the level of response and trigger the use of the EOP



SECTION 5–INCIDENT / INJURY MANAGEMENT

- 5.1 Incident/Injury Management**
- 5.2 Incident/Injury Investigation**
- 5.3 Incident Investigation Report**

Reviewed: October 2008
October 2007, September 2004
Date Accepted: April 2002



5.1 INCIDENT / INJURY MANAGEMENT

A. Objective

To provide guidelines for the management of incidents and injuries, and to comply with all applicable requirements.

B. Scope

All employees.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1904, Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Procedure

• LIFE-THREATENING INJURIES

Examples of life-threatening circumstances are severe chest pains, gun shot wounds, severe burns, hemorrhaging, severe head injury, open (compound) fractures, etc.

1. Call **911** let them know the need for an ambulance.
2. Notify the injured person's supervisor of the incident.
3. If the incident was due to a work related event the supervisor should complete an Incident/Injury Report and send it to Human Resources, with a copy to the Manager, Environmental Health and Safety.

• OTHER INJURIES (NON-LIFE-THREATENING)

1. Notify the injured person's supervisor of the incident.
(If the supervisor is not available notify Harper Police.)
2. Escort the injured person to Health and Psychological Services (HPS).
(During their open hours: Monday-Thursday 8am-6pm, Friday 8am-4:30pm).
Have someone call HPS x6268 before proceeding, to ensure they can assist with the injury.
3. Health and Psychological Services will evaluate the injured person and provide treatment or refer them to Alexian Brothers Corporate Health Services (ABCBS) at 361 West Golf Road, Schaumburg, IL. (also referred to as the Occupational Health Clinic)
4. After hours when Health and Psychological Services is closed, the supervisor or designated representative should take the injured person to St. Alexius Medical Center Emergency Room at 1555 Barrington Road, Hoffman Estates, IL.
5. If the incident was due to a work related event the supervisor should complete an Incident/Injury Report and send it to Human Resources, with a copy to the Manager, Environmental Health and Safety.

• ALL TYPES OF INJURIES

1. Keep the injured person as comfortable as possible.
2. Do not move the injured person any more than necessary for his/her safety.
3. Never administer liquids to an unconscious victim.
4. Do not remove objects that may be embedded into the injured person's skin.



E. Implementation

• Prompt Medical Attention

Prompt and appropriate medical attention is key to injury treatment. If an employee was injured on the job they should get immediate medical attention. Any injury larger than a “band-aid” should receive medical treatment. The employee should first go to Health & Psychological Services (HPS), if treatment is beyond their services the employee will be referred to Alexian Brothers Corporate Health Services (ABCCHS). ABCCHS has a team of occupational physicians, nurses and physical therapists that have extensive experience with on the job injuries. The ABCCHS team can provide immediate treatment or refer the employee to a specialist for treatment.

• Incident / Injury Reporting

All employees have the responsibility to report all accidents and near-miss (those unplanned events that do not result in injury, financial loss, or property damage) incidents to their supervisor immediately.

The injured person’s supervisor shall fill out an *Incident Investigation Report* (see Section 5.2 of the *EH&S Manual*). This report shall be sent to the Manager, Environmental Health & Safety (Mgr. EH&S) and the Human Resources Department. If needed, a copy will be forwarded to the Health and Psychological Services. The Mgr. EH&S will review the report and follow-up on corrective action.

• Modified Duty Program

If it is determined by HPS and/or ABCCHS that as the result of a work related injury or illness, an employee is not able to perform his/her normal duties but is able to perform other meaningful tasks, a modified duty assignment may be provided to the employee. The modified duty assignment is a short-term assignment until the physician has released the employee to return to their normal duties.

Upon notification by HPS and/or ABCCHS that an employee is ready to resume normal duties, HPS will advise his/her department of the employee’s change in work status.

• Workers’ Compensation Benefits

If, after initial treatment or examination at ABCCHS, ER or personal physician, the injured employee is authorized to be absent from work and /or will require additional treatment or medical care, he/she may be eligible for certain disability benefits under the Illinois Workers’ Compensation and Occupational Diseases Act. This will depend on the length of the authorized absence and the nature of employment with the College.

Any follow-up medical/hospital expense incurred by an employee from ABCCHS, his/her personal physician and/or hospital facility for treatment of a work related injury should be forwarded to Human Resources Department.

Questions regarding Workers’ Compensation Benefits should be directed to either the Manager, Environmental Health & Safety or the Human Resources Department.



5.2 INCIDENT / INJURY INVESTIGATION

A. Objective

To determine the circumstances in the workplace that resulted in an incident, injury, or near miss (those unplanned events that do not result in injury, financial loss, or property damage), so that effective corrective action can be taken to prevent recurrence.

B. Scope

All occupational incidents, illnesses, and near misses shall be investigated.

C. Responsibilities

- Employees must immediately report all occupational incidents, illness and near misses to their immediate supervisor.
- The supervisor of the area in which the incident, illness or near miss occurred shall assure a complete and thorough accident investigation is conducted. An *Incident Investigation Report* should be completed and a copy shall be sent to the Human Resources Department.
- The Manager of Environmental Health & Safety shall also receive a copy of the *Incident Investigation Report* to review the report to assure completeness, accuracy, follow-up, and maintain a copy in the College's incident database.
- The Manager of Environmental Health & Safety can assist the supervisor in incident investigation and completing the *Incident Investigation Report* as required.

D. Supervisor's Investigation Procedures

- **GO** to the scene of the accident at once.
- **TALK** with injured person, if possible. Talk to witnesses. Stress getting the facts, not placing blame or responsibility. Ask open-ended questions.
- **LISTEN** for clues in the conversations around you. Unsolicited comments often have merit.
- **ENCOURAGE** people to give their ideas for preventing a similar accident.
- **STUDY** possible causes—unsafe conditions, unsafe practices.
- **CONFER** with interested persons about possible solutions.
- **WRITE** your accident report giving a complete, accurate account of the accident. Do not offer opinions.
- **FOLLOW-UP** to make sure conditions are corrected. If they cannot be corrected immediately, report this to the Manager of Environmental Health & Safety.
- **PUBLICIZE** corrective action taken so that all may benefit from the experience.



E. Completing the Investigation Report

Once the investigation process is complete and the facts are known, preparing the report should not be difficult. Follow the steps to complete the *Incident Investigation Report*.

Report Questions- One through 14 are self-explanatory but are important for administrative and follow-up reasons.

- **Injury**

15- **Incident Type-** This explains the type of incident being investigated, i.e., fall from ladder, stepped on nail, electrical shock, struck by a vehicle, fire, lifting materials, etc.

16- **Part of Body Injured** – arm, leg, etc.

17- **Lost Time-** This is time lost due to an incident where the employee could not return to work immediately.

18- **Incident Treatment** - This is where the employee was sent for treatment.

- **Description** 19- Describe in complete detail what happened ask open-ended investigative questions such as where-when-why-how. Describe the activity the worker was involved in, who else was involved (list witnesses), what materials, equipment or tools were involved (MSDS, Serial, and Model Numbers). Describe the types of Protective equipment required and how actually used.

- **Cause** 20- This is the most critical question in the investigation because it identifies the act or condition requiring change that will control recurrence of like accidents. The investigator needs to get beyond just the employee involved; evaluate all of the management operational controls that could be responsible for the accident.

SPECIAL NOTATION: DO NOT STATE THAT THE INCIDENT WAS A RESULT OF EMPLOYEE CARELESSNESS! SPECIFICALLY DEFINE THE UNSAFE ACT OR CONDITION INVOLVED THAT MAY AT FIRST APPEARS TO BE CARELESSNESS, I.E. DISTRACTION, NOISE STRESS, HEAT, COLD, OR OTHER NATURAL AND UNNATURAL FACTORS.

- **Evaluation**

21. **Violation of Safety Procedures** - List procedures.

22. **Appropriate Personal Protective Equipment** - Describe the type of Personal Protective Equipment.

23. **Training** –Did the employee receive appropriate training prior to the injury? Describe the type of training and date of training received.

- **Correction** 24 -Based on the information developed through previous questions, clearly define steps that must be taken to prevent similar accidents in the future. Solutions that permanently fix the problem.

- **Routing** The Supervisor, should review the incident investigation report for completeness and accuracy, sign and date the report, and forward it to the Manager Environmental Health & Safety, (Sara Gibson, sgibson@harpercollege.edu) and a copy to Human Resources, (Jodie Olsen, jolsen@harpercollege.edu) .



5.3 INCIDENT INVESTIGATION REPORT

1. Name of Employee:		2. Home Address:		3. Employee #:	
4. Date of Birth:		5. Gender: <input type="checkbox"/> Male or <input type="checkbox"/> Female		6. # of dependent Children under 18:	
7. Marital Status: <input type="checkbox"/> Married, <input type="checkbox"/> Single or <input type="checkbox"/> Divorced			8. Department:		
9. Classification: <input type="checkbox"/> Classified, <input type="checkbox"/> Super Con., <input type="checkbox"/> IEA/NEA, <input type="checkbox"/> ICOPS, <input type="checkbox"/> Pro-Tech, <input type="checkbox"/> Admin. <input type="checkbox"/> Faculty <input type="checkbox"/> Other					
10. Check: <input type="checkbox"/> Part time or <input type="checkbox"/> Full time		11. Shift : <input type="checkbox"/> 1st <input type="checkbox"/> 2nd <input type="checkbox"/> 3rd Other: AM/PM To AM/PM			
12. Date of Incident: Time:			13. Location of Incident:		
14. Was the activity the employee was involved in, part of, or within the employee's regular job duties? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA					
INJURY		16. Body part injured:		17. Did the incident result in lost time? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes last day worked:	
15. Incident type:					
18. Incident treatment and date (check more than one if necessary):		<input type="checkbox"/> Health and Psychological Services - Date:		<input type="checkbox"/> Occupational Clinic –Date:	
		<input type="checkbox"/> Hospital/ER – Date:		<input type="checkbox"/> Personal Physician – Date:	
19. DESCRIPTION (Write a detailed description of what and how the incident happened, including witnesses.)					
20. CAUSE (Identify unsafe acts or conditions–contributor factors–base cause–lack of management operational controls)					
21. EVALUATION: Were there any violations of safety procedures? <input type="checkbox"/> No <input type="checkbox"/> Yes , If yes, explain:					
22. Was appropriate personal protective equipment being worn/used? <input type="checkbox"/> NA <input type="checkbox"/> No <input type="checkbox"/> Yes, If yes, explain: Describe type of equipment:					
23. Did the employee receive appropriate training prior to the injury? <input type="checkbox"/> NA <input type="checkbox"/> No <input type="checkbox"/> Yes Describe Training & Date:					
24. CORRECTION (How could this incident be avoided in the future? Describe changes or improvements in equipment, procedures, training and/or personal protective equipment needed.)					
25. Employee's Signature: Date:			26. Supervisor's Signature: Date:		

Send completed report to Manager EH&S & HR .

Rev. 6/03



SECTION 6–PERSONAL PROTECTIVE EQUIPMENT (PPE)

- 6.1 Personal Protective Equipment
- 6.2 Respiratory Protection Program
- 6.3 Hearing Conservation Program

Reviewed: October 2008
Revised: August 2003
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Draft Date: December 2001



6.1 PERSONAL PROTECTIVE EQUIPMENT

A. Objective

To provide a safe work environment from injuries or detrimental effects on health, which are not controllable through engineering or administrative means.

B. Scope

- Where required by law.
- Where exposure to the hazard has the potential for injury or illness to an employee.
- Where there is a potential for damage or contamination to property or the environment.
- Where the failure to utilize the equipment would expose non-employees to a safety or health hazard.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910 Subpart I, Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Responsibilities

- Personal protective equipment (PPE) required will be provided by the college.
- Departments that have jobs or tasks that require the use of PPE should be budgeted for the purchase of PPE.
- Departmental managers/supervisors shall enforce the use of PPE.
- All personnel including management and supervisory personnel shall wear PPE when in areas so designated.
- All visitors, including but not limited to, vendors, salespersons and subcontractors shall wear PPE when in areas so designated.
- Contact the Manger of Regulatory Compliance for technical support as to the use and selection of appropriate PPE.

E. Eye Protection

- All employees, students and visitors exposed to flying particles, chips, etc, shall wear appropriate eye protection.
- Safety Glasses: Safety glasses look very much like normal glasses but are designed and manufactured to certain standards to protect against flying particles. Safety glasses have lenses that are impact resistant and frames that are far stronger than regular street wear. Safety glasses must have side shields and should be worn whenever there is the possibility of flying particles, dust, wood chips, or paint to enter the eye. Always wear safety glasses when using any power tool.
- Goggles: Like standard safety glasses, goggles are impact resistant. Goggles provide a secure shield around the entire eye area to protect against hazards coming from many directions. Safety goggles may have regular or indirect ventilation.



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(Goggles with indirect ventilation may be required if you are exposed to splash hazards, e.g., solvents, paints or thinners).

- In addition to safety glasses, a full face shield shall be worn by employees involved in air-blast cleaning, chipping, chiseling, concrete breaking, equipment wash-down, grinding, handling and using chemicals, high-speed sawing, power brushing or buffing, sandblasting and steam cleaning.
- In addition to safety glasses, appropriate tinted goggles shall be worn for all torch cutting or burning operations.
- In addition to safety glasses, a welding hood shall be worn by all employees performing, assisting or observing welding, burning or cutting operations.
- Eye- and face-protective devices shall conform to the requirements of ANSI Z87.1–1989.
- Eye- and face-protective devices shall:
 - Be reasonably comfortable, yet fit snugly and not unduly interfering with the movement of the wearer.
 - Be kept clean and in good repair.
- Management, with appropriate technical support shall designate the department and/or individual responsible for the issuance, care and control of each type of eye- and face-protective device.
- Management, with the appropriate technical support shall post signs identifying eye- and face-protection requirements at required locations.

F. Head Protection

- Head protection shall be required where there is potential for injury to the head from falling objects.
- Management, with appropriate technical support shall post signs identifying head protection requirements at appropriate locations.
- Protective helmets shall comply with ANSI Z89.1-1986.

G. Foot Protection

- Employees and authorized visitors shall wear shoes or boots, which are suitable for the areas of the facility in which they are working or visiting.
- Employees working in areas or jobs where there are dangers of foot injuries due to objects falling, rolling, crushing or piercing the sole, and where such employee's feet are exposed to electrical hazards shall wear protective footwear.
- Protective footwear shall comply with ANSI Z41-1991.



H. Hand Protection

Supervisors shall select and require employees to use appropriate hand protection when employee's hands are exposed to hazards such as those from skin absorption of harmful substances; severe cuts or lacerations; severe abrasions; punctures; chemical burns; thermal burns and harmful temperature extremes.

I. Protective Clothing and Equipment

Protective clothing and equipment shall be provided to accomplish all assigned task in a safe and healthful manner.



6.2 RESPIRATORY PROTECTION PROGRAM

A. Objective

To provide a safe work environment from detrimental effects on health from airborne hazards, which are not controllable through engineering or administrative means.

B. Scope

- Where required by law.
- Where exposure to an airborne hazard has the potential for injury or illness to an employee.

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910.134, Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Responsibilities

- Supervisors shall be familiar with the chemicals and products that are being used in the workplace.
- Supervisors shall contact the Manager of Environmental Health & Safety if they have employees working with chemicals or processes that create an airborne hazard.

E. Procedure

- Where chemicals or products that must be used create an airborne hazard, personal air sampling shall be conducted to determine the exposure and appropriate respiratory protection. The Manager of Environmental Health & Safety will conduct, or hire an outside consultant to conduct personal and/or area air sampling for the airborne hazard.
- The Manager of Environmental Health & Safety will determine if respiratory protection is needed and if so the appropriate type of respiratory protection.
- All respirator selection and purchase shall be through the Manager of Environmental Health & Safety and/or Health and Psychological Services.
- If it is found that respiratory protection is needed the employee must be medically approved to wear a respirator by Health and Psychological Services.
- Health and Psychological Services will provide a medical evaluation of the employee.
- The Manager, Environmental Health & Safety will conduct training and fit testing to the employee on an annual basis.
- In areas or during chemical processes that have been determined to create an airborne hazard, all personnel, including management and supervisory personnel, shall wear a respirator when in areas so designated.



F. Types of Respirators

The Manager of Environmental Health & Safety and/or Health and Psychological Services will determine the type of respirator to be worn based on the type of work, the toxicity of the hazard and the particle size on the hazardous substance. Only National Institute for Occupational Safety and Health (NIOSH) approved respiratory protection equipment shall be worn.

There are three basic respirator types:

1. **Air-purifying**-use the wearer's breath to draw air through filters or chemical cartridges in order to purify the air before it is inhaled. This is the most common type of respirator.
2. **Powered air-purifying**-a pump draws air through a filter or cartridge to the wearer.
3. **Air-supplying**- bring a supply of fresh air to the wearer, usually by means of pressurized gas cylinders or air compressors. This type of respirator is the only type that may be used in oxygen-deprived atmospheres.

The most common type of respirator is the **air-purifying respirator**, in which there are three types:

1. **Disposable**, which often look like paper dust masks and are thrown away after they are used.
2. **Half-face**, which cover the mouth, nose and chin and have replaceable filters and cartridges.
3. **Full-face**, which look like old-fashioned gas masks and have a replaceable canister.

Additionally, these air-purifying respirators must have the proper type of filter or respirator cartridge. The Manger of Regulatory Compliance will identify the proper type of filter or cartridge based on the physical and chemical composition of the hazardous substance. Air purifying respirators shall never be used in oxygen-deficient atmospheres.

G. Training

Training shall be provided on the hazards to which they are potentially exposed. The training shall include:

- Explanations and discussions of respiratory hazards and misuse;
- The need for respiratory protection;
- The reason for selecting a particular respirator;
- The function, capabilities, and limitations of the selected respirator;
- The method for donning the respirator and checking its fit and operation;
- Proper wearing instructions; respirator maintenance;
- Recognizing and handling emergency situations;
- Special instructions as required;
- Regulations concerning respirator use;
- Identification of the appropriate respirator cartridges and canisters used, by printed label and color code.

H. Employee Care and Use of Issued Respirators

Employees or students that have been issued respirators either for required use or voluntary use must follow the following guidelines:

1. Conduct a "self fit check" or "user seal check" when the respirator is first put on to make sure the respirator is properly sealed around the face. This is done by putting on the respirator and seeing if the it will briefly maintain negative pressure when the wearer inhales or will maintain positive pressure



when the wearer exhales. The respirator doesn't fit if the wearer feels air escaping near the nose, under the chin, or from some other place where the seal is broken.

2. No facial hair is allowed to come in contact with the seals of a tight fitting air-purifying respirator; this includes but is not limited to stubble beard growth, beard, mustache or side burns. If an employee or student with facial hair requires a respirator, a hooded supplied-air or powered air-purifying respirator must be used.
3. At the end of the work period, clean the respirator and store it out of sunlight in a sealable plastic bag. Respirators should never be hung on hooks in the open or left on counters in the work area. Cartridges left out will continue to capture contaminants from the air; they should also be stored in sealable plastic bags.
4. Respirators should not be shared. Keep track of your respirator so that you do not mistakenly use some else's respirator.
5. Inspect respirators carefully and periodically for wear and damage. If there is damage to the respirator, return the respirator to the supervisor for repair or replacement.

I. Voluntary Use of Respirators

Supervisors may provide respirators at the request of the employees or permit employees to use their own respirators, if the respirator use will not itself create a hazard.

Employees using a respirator voluntary must still participate in the Respiratory Protection Program, which entails being medically evaluated, fit tested and trained. The Manager of Environmental Health & Safety shall be contacted to review the type of respirator.

Employees shall be given a copy of Section 6.2 -*Information for Voluntary Use of Respirators*.

Exception: Employees, who use surgical masks are not required to participate in the Respiratory Protection Program.

J. Program Evaluation

Supervisors shall conduct an evaluation of their employees in the respirator program to assess the employee's views on program effectiveness and to identify any problems. The evaluation should ensure employees are using their respirators appropriately, maintaining their respirators, and that they don't interfere with work.



6.3 INFORMATION FOR VOLUNTARY USE OF RESPIRATORS

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substances does not exceed the limits set by OSHA standards. If you are given a respirator by your supervisor for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warning regarding the respirator's limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health (NIOSH) of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

I, have decided voluntarily to wear a respirator. I have read and understand proper respirator use and care.

Name (print): _____

Signature: _____ Date: _____

Department: _____

Circle type of respirator:

Disposable air purifying respirator

OR

Half-face cartridge, air purifying respirator



6.4 HEARING CONSERVATION PROGRAM

A. Objective

To provide a safe work environment from detrimental effects of noise exposure, which are not controllable through engineering or administrative means.

B. Scope

- Where required by law.
- Where exposure to noise has the potential for injury to an employee.
- Where noise exposure equals or exceeds an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response) or an equivalent dose of fifty percent, this *Hearing Conservation Program* will be implemented.

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910.95, Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Responsibilities

- Supervisors shall contact the Manager of Environmental Health & Safety to conduct sound level readings in areas that are thought to have sound levels equal to or exceeding 85 decibels.
- Employees who work in posted hearing protection areas or whose jobs require participation in the *Hearing Conservation Program* must take part in sound level monitoring, baseline and annual audiogram, training and use of hearing protection.
- Areas that have been determined to have noise levels equal to or exceeding 85 decibels should have posted and enforced hearing protection. All personnel including management and supervisory personnel shall wear hearing protection when in these posted areas.

E. Procedure

- **Monitoring** shall be conducted by the Manager of Environmental Health & Safety or an outside agency when information indicates that any employee's exposure may exceed 85 decibels. Employees will be informed of the monitoring results.
- **Audiometric testing and evaluation** shall be conducted for employees within their first 6 months on a job that is identified to participate in the *Program* and annually thereafter. Audiometric testing will be conducted by Health and Psychological Services or a designated healthcare provider.
- **Audiometric evaluation** shall be conducted by Health and Psychological Services or an approved health care provider. The evaluation shall compare the annual audiograms to the baseline audiograms to determine if there is a standard threshold shift (as defined in the OSHA standard as change in hearing of 10 decibels or more at 2000, 3000, and 4000Hz in either ear, allowances may be made for age). If it has been determined an employee has a standard threshold shift they shall be retested within 30 days. If follow-up still indicates a standard threshold shift the employee must be notified in writing within 21 days of the determination.



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- **Hearing protection** shall be selected by the Manager of Environmental Health & Safety and provided to employees by their supervisors.
- **Training** shall be conducted annually by Health and Psychological Services or the designated health care providers conducting the audiometric testing to inform employees of the following:
 - 1) The effects of noise on hearing
 - 2) The purpose of hearing protectors, the advantages, disadvantages and attenuation of various types, and instructions on selection, fitting, use and care.
 - 3) The purpose of audiometric testing, and an explanation of the test procedures.
- **Recordkeeping** of audiometric testing shall be kept in the Health and Psychological Services. Exposure measurements of specific jobs shall be kept by the Manager, Environmental Health & Safety.



SECTION 7–HAZARD COMMUNICATION **PROGRAM**

- 7.1 Hazard Communication
- 7.2 Training Document
- 7.3 Material Safety Data Sheets (MSDS)
- 7.4 MSDS Request

Reviewed: October 2008
Date Accepted: April 2002
Draft Date: December 2001



7.1 HAZARD COMMUNICATION

A. Objective

This Hazard Communication Program is a plan to ensure that all employees and students receive adequate information relevant to the possible hazards, which may be involved with the various hazardous substances used at the College.

B. Scope

This policy covers all potential workplace exposures involving hazardous substances as defined by Federal, State and local regulations.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910.1200, Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Responsibilities

- Supervisors must inform employees, students and visitors of hazardous chemicals used in the area.
- Supervisors must make sure that Material Safety Data Sheets (MSDS) are readily available for all hazardous chemicals used in the work area. An inventory of hazardous substance shall also be maintained for information on the amount and location of hazardous chemicals.
- Supervisors must ensure containers of hazardous chemicals are always properly labeled.
- Employees working with hazardous chemicals must attend Hazard Communication training to ensure they understand the hazards and how to read an MSDS.
- The Manager, Environmental Health & Safety or Laboratory Chemical Hygiene Officer can provide training and assistance in Hazard Communications.

E. Hazardous Chemical Definition

A hazardous chemical is defined by OSHA as any chemical that is a **health hazard** or a **physical hazard**.

- **HEALTH HAZARD:** OSHA defines a health hazard as a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. Chemicals covered by this definition include carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents that act on the hematopoietic system, and agents that damage the lungs, skin, eyes, or mucous membranes.
- **PHYSICAL HAZARD:** OSHA defines a physical hazard as a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive), or water-reactive.



- **ADDITIONAL HAZARDOUS CHEMICALS:** The broad definition OSHA uses to define hazardous chemicals includes not only generic chemicals, but also paints, cleaning compounds, inks, dyes, and many other common substances. Chemical manufactures and importers are required to determine if the chemicals they produce or repackage meet the definition of a hazardous chemical. A chemical mixture may be considered as a whole or by its ingredients to determine its hazards. It may be considered as a whole if it has been tested as a whole and a Material Safety Data Sheet (MSDS) has been issued accordingly. Otherwise the mixture must be evaluated by its components. If the mixture contains 1.0% or more of a hazardous chemical or 0.1% of an ingredient listed as a carcinogen or suspected carcinogen, the whole mixture is assumed to have the same health and/or carcinogenic hazards as its components.
- See page 56 for additional definitions.

F. Container Labeling

- No container or hazardous substances will be released for use unless the container is correctly labeled and the label is legible.
- All chemicals in bags, drums, barrels, bottles, boxes, cans, cylinders, reaction vessels, storage tanks, or the like will be checked by the receiving department to ensure the manufacturer's label is intact, is legible, and has not been damaged in any manner during shipment. Any containers found to have damaged labels will be quarantined until a new label has been installed.
- The label must contain:
 - (a) identity of the hazardous chemical(s), by a trade name, generic chemical name, or a manufacturer's code number of the product.
 - (b) hazard warnings in words, pictures, symbols, or combination thereof, which provide at least general information regarding the hazards of the chemical (s). The College has adopted the National Fire Protection Association (NFPA) 704 labeling system for identification of hazards.
- All secondary containers shall be labeled. The information must include details of all chemicals, which are in the referenced container.
- **EXEMPTIONS TO LABELING:** A portable chemical container filled from a labeled container by an employee who uses it immediately or during his or her work shift does not have to be labeled. However, if any of the material is left at the end of the work shift, it must be labeled or returned to a labeled container. Pipes and piping systems do not have to be labeled.

G. Material Safety Data Sheets (MSDS)

- The College Physical Plant Department will maintain a master MSDS file. These Material Safety Data Sheets are available to all employees, at all times, upon request.
- Department's shall keep a binder with copies of the MSDS used in the area.
- A Department Head or their designee will be responsible for reviewing all incoming MSDS for new and significant health/safety information. The designee will ensure that any new information is passed on to the employees involved.



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- The Department Head or their designee will review all incoming MSDS for completeness. If any MSDS is missing or obviously incomplete, a new MSDS will be requested from the manufacturer or distributor. OSHA is to be notified if the manufacturer or distributor will not supply the MSDS or if it is not received after 30 days from request. Any new information will be passed on to employees involved.
- New materials will not be introduced into the work area until a MSDS has been received.
- The department that makes the purchase will make it an ongoing part of their function to obtain MSDS for all new materials when they are first ordered.
- The Manager of Environmental Health & Safety shall coordinate with appropriate departments to make sure all MSDS are obtained, distributed and communicated.

H. List of Hazardous Substances

Each department shall compile, annually review, and update as necessary a complete inventory of all substances present in that department. The name of those materials determined to be hazardous are defined in applicable Federal and State standards.

The College has a database to keep an inventory of hazardous substances on campus. Departments shall keep this database up to date with the name of the hazardous substance, location and approximate quantity. Contact the Manager, Environmental Health & Safety for assistance or access to the database.

I. Employee Information & Training

All employees that work with hazardous substances will attend an orientation meeting for information and training on the following items prior to starting work with hazardous substances; (Training CHECKLIST is to be completed and kept on file).

- An overview of the requirements of the Hazard Communication Standard, including their rights under this regulation.
- Information on where hazardous substances are present in their work areas.
- Information regarding the use of hazardous substances in their specific work areas.
- The location and availability of the written Hazard Communication Program. Subsequent to this, the program will be available from managers and also from the Manager of Environmental Health & Safety.
- The physical and health aspects of the substances in use.
- Methods and observation techniques used to determine the presence or release of hazardous substances in the work area.
- The controls, work practices and personal protective equipment, which are available for protection against possible exposure.
- Emergency and first aid procedures to follow if employees are exposed to hazardous substances and the signs and symptoms of overexposure to hazardous chemicals in the workplace.



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- How to read labels and Material Safety Data Sheets (MSDS) to obtain the appropriate hazard information.
- Training is required at the time of initial assignment and whenever a new physical or health hazard is introduced into the work area.

It is most important that all of our employees understand the information given in the orientation meetings. Questions regarding this information should be directed to the Manager of Environmental Health & Safety.

When new substances are introduced into the workplace the Department manager will review the above items with you as they are related to the new materials.

The department manager will relay all the above information to new employees, who will be working with hazardous substances, prior to their starting work.

J. Non-Routine Tasks

Infrequently, employees may be required to perform non-routine tasks, which involve the use of hazardous substances. Prior to starting work on such projects, each involved employee will be given information by his/her supervisor about hazards to which they may be exposed during such an activity.

This information will include:

- The specific hazards.
- Protective/safety measures which must be utilized.
- The measures the college has taken to lessen the hazards, including special ventilation, respirators, the presence of another employee, air sample readings, and emergency procedures.

K. Informing Contractors

To ensure that outside contractors work safely at the College, and to ensure the safety of the contractor's employees, it will be the responsibility of management to provide contractors the following information:

- The hazardous substance to which they may be exposed while working at the College.
- The precautions the contractor's employees must take to lessen the possibility of exposure by usage of the appropriate measures.
- Rules and regulations regarding the protection of employee safety relevant to fire and ignition sources around flammable materials will be followed. The rules regarding smoking, welding, grinding, will also be followed.

Outside contractors shall supply the name of any hazardous substance the contractor's employees may be bringing into the facility for use in their work. The contractor should also supply a copy of the MSDS relevant to these materials.

L. Laboratory Requirements

- Ensure that labels on incoming containers of hazardous chemicals are neither removed nor defaced.
- Maintain any MSDS that are received with hazardous chemicals, and ensure that MSDS for all hazardous chemicals in the work area are readily accessible to laboratory



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employees during the times they work in the laboratory and to emergency response personnel.

- Provide information and training to employees regarding the hazardous chemicals in their work area at the time of their first work assignment and again whenever a new health or physical hazard is introduced into their work area. Laboratory employees are to receive the same training as discussed in section G. Employee Information and Training. Additionally, laboratory employees must understand and follow the standard operating procedures for the correct handling of hazardous chemicals as covered in the *Harper College Laboratory Chemical Hygiene Plan (Section 8 of the EH&S Manual)*.

M. Plan Administration

The Manager of Environmental Health & Safety will monitor this Hazard Communication program.

Questions regarding this program should be directed to the Manager of Environmental Health & Safety.

N. Health Hazard Definitions

Carcinogen: A substance that causes or promotes cancer as determined by International Agency on Cancer (IARC), National Toxicology Program (NTP), or Occupational Safety and Health Administration (OSHA).

Corrosive: A chemical that causes visible destruction of, or irreversible alteration in, living tissue at the point of contact.

Irritant: A chemical that causes a reversible inflammatory effect on living tissue at the point of contact.

Sensitizer: A chemical that causes a substantial proportion of exposed people to develop an allergic reaction to tissue after repeated exposure.

Target Organ Effects: The following is a target organ categorization of effects that may occur and examples of chemicals, which have been found to cause such effects.

- **Hepatotoxins** - chemicals which produce liver damage: carbon tetrachloride, nitrosamines
- **Nephrotoxins** - chemicals which produce kidney damage: halogenated hydrocarbons, uranium
- **Neurotoxins** - chemicals which effect the central nervous system: mercury, carbon disulfide
- **Reproductive toxins** - chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and damage to the developing fetus (teratogens): lead, dibromochloropropane
- **Agents which act on the hematopoietic system or blood by decreasing the hemoglobin function and depriving the body tissue of oxygen:** carbon monoxide, cyanides
- **Agents which damage the lungs, irritate mucous membranes, or damage pulmonary tissue:** asbestos, silica
- **Agents which damage the eyes, or effect visual capacity:** organic solvents, acids, bases
- **Agents which damage the skin, defatting of the skin, irritation, rashes of the dermal layer:** ketones, chlorinated compounds



Toxic: A substance, when administered orally in rats, that has an LD_{50} of more than 50mg/kg but not more than 500mg/kg. A substance, when administered by continuous skin contact on rabbits, that has an LD_{50} of more than 200mg/kg but less than 1,000mg/kg. A gas or vapor, when administered by continuous inhalation to rats, that has an LC_{50} of more than 200ppm but less than 2,000ppm or a dust, mist or fume that has an LC_{50} of more than 2mg/L but not more than 20mg/L.



7.2 HAZ COM TRAINING DOCUMENT

Manager Training of Employee Checklist

Has the employee been informed and trained in the following.

	YES	NO
1. <u>Information:</u> Has the employee been informed of the following:		
(a) The requirements of this section.	_____	_____
(b) Any operation in the work area where hazardous substances are present	_____	_____
(c) The location of the written Hazard Communication Program	_____	_____
(d) Availability of the written program.	_____	_____
(e) Location and availability of hazardous substances list(s).	_____	_____
(f) Location and availability of Material Safety Data Sheets.	_____	_____
2. <u>Training:</u> Has the employee been trained in the following:		
(a) Methods and observations that may be used to detect the presence or release of hazardous substances in the work areas.	_____	_____
(b) The physical and health hazards of the substances in the work areas.	_____	_____
(c) How employees can protect themselves from these hazards.	_____	_____
(d) Procedures the employer has implemented for employee protection.	_____	_____
(e) Appropriate work practices.	_____	_____
(f) Emergency procedures.	_____	_____
(g) Personal protective equipment to be used.	_____	_____
(h) Explanation of labeling systems.	_____	_____
(i) Explanation of material safety data sheets.	_____	_____
(j) How employees can obtain and use appropriate hazard information.	_____	_____
(k) Personal hygiene when working with substances.	_____	_____
(l) General first aid for contact with hazardous substances.	_____	_____

Employee Signature

Manager's Signature

Date

Date



7.3 HAZ COM TRAINING DOCUMENT

Training Acknowledgement

I have received information on the Hazard Communication Standard 29 CFR 1910.1200 and the Harper College Hazard Communication Program and understand how to interpret and to use the labeling systems and Material Safety Data Sheets (MSDS) that are in use and accessible to me in my work area. I agree to observe and follow the safe work practices as presented to me in the training sessions I attended.

Employee's Signature

Date

The above named employee has been informed and instructed by _____ . Work practices, chemical hazards recognition, interpretation and use of chemical labels, MSDS, the Hazard Communication Standard 29 CFR 1910.1200, the Harper College Hazard Communication Program and the location at which these items are accessible to the employee.

Supervisor's Signature

Date



7.3 HAZ COM TRAINING DOCUMENT

Training Acknowledgement (Spanish)

Yo he recibido informacion sobre Comunicacion de Peligros Estandarte 29 CFR 1910.1200, y comprendo como usar y interpretar los sistemas de marcado junto con las Hojas de Datos sobre Seguridad (MSDS), que se encuentran en uso y accessible en me area de trabajo. Yo estoy de acuerdo a observar y seguir las practicas seguras presentades a mi en la sesion de entrenamieno atendida este dia,

_____ en _____

Firma de Empleado

Fecha

El empleado nombrado anterior, a sido inf ormado y instruido por _____ en las practicas seguras, a reconocer peligros de quimicas, la intpretacion y uso de las etiquetas quimica, MSDS, la CFR 29. 1910.1200, y la locacion en donde estos articulos son accessible a los empleados.

Supervisor o Mayordome

Fecha



7.3 MSDS

A. Material Safety Data Sheets (MSDS)

OSHA rules outline the content, but not the exact form, of every Material Safety Data Sheet. Here is what OSHA requires each data sheet to contain:

- **IDENTITY.**
- **CHARACTERISTICS.** The data sheet must recite the physical and chemical characteristics of the chemical, such as vapor pressure, flash point. etc.
- **PHYSICAL HAZARDS.** Any potential for fire, explosion or reaction must be included in the data sheet.
- **HEALTH HAZARDS.** Signs and symptoms of exposure must be entered, as must all medical conditions that are likely to be aggravated by exposure.
- **ROUTES OF ENTRY.** The data sheet must specify whether the chemical typically enters the system by ingestion, inhalation, dermal exposure or some other route.
- **EXPOSURE LIMITS.** If OSHA has established an exposure limit for the chemical, or if the American Conference of Governmental Industrial Hygienists has established a Threshold Limit Value, these must be entered on the data sheet, as must any exposure limit used by the authority preparing the data sheet.
- **CARCINOGENS.** The data sheet must indicate whether the National Toxicology Program, OSHA, or the International Agency for Research in Cancer, lists the chemical as a carcinogen.
- **USE AND HANDLING.** The data sheet must recite any general applicable precautions for safe handling and use which is known to the Firm preparing the data sheet, including hygiene practices, protective measures during repair and maintenance of contaminated equipment and procedures for clean-up of spills and leaks. Industrial chemical consumers might often add site-specific procedures to the more general information offered by the chemical manufacturer.
- **EXPOSURE CONTROLS.** The data sheet must include a description of special procedures to deploy in emergencies, as well as description of appropriate first aid.
- **DATES.** The sheet must bear the date of its preparation or of its latest revision.
- **INFORMATION SOURCE.** Finally, the sheet must recite the name, address and telephone number of the person who prepared the data sheet or of some other person who can provide additional information relating to the chemical, such as citations to scientific literature or specialized emergency procedures.

B. Material Safety Data Sheets (MSDS) Sections

OSHA rules outline the content, but not the exact form, of every MSDS. Here is what OSHA requires each data sheet to contain.

The MSDS is obtained from the hazardous substance manufacturer or supplier. You should become familiar with the information to avoid injury to yourself and fellow employees. Following is a description of the MSDSs principle sections.

- **Section I—Identification of Product**



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The data sheet must contain the name of the chemicals found on the label. In addition, subject to deletion of legitimate trade secrets, it must give the chemical and common name of the substance, trade name, synonym and/or manufacturer's name. If the substance is a mixture and has not been tested as such, the data sheet must give the name of each hazardous constituent.

- **Section II–Hazardous Ingredients**

Hazardous ingredients are those substances, which have been defined as hazardous due either to flammability characteristics or to their potential to have adverse health effects on the worker. The percentage of each hazardous ingredient in the product is provided, as well as the Threshold Limit Value.

- **Section III–Physical Data**

This is primarily technical data providing little help to you unless you are a chemist. This data is used by chemists and industrial hygienists when doing calculations to determine the safe use parameters of the substance.

- **Section IV–Fire and Explosion Hazard Data**

In this section, data is provided which describes the ability of the substance to burn or explode. The method for extinguishing a fire involving the substance is also provided. Pertinent data in this section is:

*Not all hazardous substances are flammable or explosive.

1. **Flash Point**–This is the lowest temperature at which the liquid gives off sufficient vapor to form an ignitable mixture with air and produce a flame when an ignition source is brought near the surface of the liquid.
2. **Extinguishing Media**–The type of fire extinguishing material to be used when a particular substance is burning is provided here.
3. **Special Fire Fighting Procedures**–These procedures describe the fire fighting equipment needed if the substance is involved in a fire. Some substances can give off toxic gases when burning; therefore, a special piece of personal protection equipment would be worn by persons fighting the fire. Talk to your supervisor regarding your actions in the event of a fire involving a hazardous substance.
4. **Unusual Fire and Explosion Hazards**–This section provides information on substance incompatibility or its ability to react with other substances to create a flammable atmosphere.

- **Section V–Health Hazard Data**

Data included in this section is very important to you. This information will help you recognize the effects of overexposure to a particular hazardous substance, and the emergency and first-aid procedures to take in the event of overexposure.



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Terms and their definitions found in this section follow:

1. **Exposure Limits**—The value printed on the MSDS expresses the airborne concentration of material to which nearly all persons can be exposed day after day without adverse health effects. Threshold Limit Values (TLV) may be expressed in three ways; as a Time Weighted (TWA), as a Short Term Exposure Limit (STEL), and/or as the Ceiling Exposure Limit (C). Engineers and industrial hygienists use the TLV as a guide in the control of health hazards.
2. **Routes of Entry**- The data sheet must specify whether the chemical typically enters the system by ingestion, inhalation, dermal exposure or some other route.
3. **Effects of Overexposure**—Describes what physical effects might be felt (dizziness, headaches, skin irritation, dermatitis, etc).
4. **Emergency and First-Aid Procedures**—Explains the procedures to follow should it become necessary to provide first-aid treatment to a person who may be overcome by a hazardous substance. The procedures may address exposures that occur through inhalation of the substance, contact with skin, or ingestion (swallowing).
5. **Carcinogens**-The data sheet must indicate whether the chemical is listed as a carcinogen by the National Toxicology Program, by OSHA, or by the International Agency for Research in Cancer.

• Section VI—Reactivity Data

This section presents information on reactive substances. Reactive substances are materials, which, under certain environmental or induced conditions, enter into violent reaction with spontaneous generation of large quantities of heat, light, gases (flammable and non-flammable), or toxicants that can be destructive to life and property. Reactions occur often when incompatible materials are mixed together.

Some loosely categorized types of reactive chemicals are:

1. **Explosives**—(i.e. nitroglycerin), reacts to friction, heat, or shock.
2. **Acids**—Don't mix with sulfides, nitrites, nitrates, cyanides, or azides.
3. **Oxidizers**—Don't mix with reducers.
4. **Water Sensitives**—Should not be mixed with water.
5. **Pyrophors**—Those substances that generate sparks or heat when friction is applied—like a red-tip match head.

When reviewing a particular data sheet, note the conditions to avoid, and incompatibility (materials to avoid). In general, isolate from other potentially reactive substances. Use appropriate personal protection gear that is recommended in Section VIII—Special Protection Information.



- **Section VII–Spill or Procedures**

This section directs persons to take certain actions in the event of a hazardous substance spill or leak. Do not attempt to contain a spill or leak by yourself! Get help from your supervisor!

- **Section VIII–Special Protection Information**

This section specifies the proper personal protection devices for specific situations. Types of recommended equipment will include respirators, goggles, face shield and safety glasses, gloves, protective aprons, footwear, etc.

Ventilation equipment will not necessarily be applicable. These requirements are based on amount used; container substance is stored in, conditions use occurs in, etc.

- **Section IX–Special Precautions**

Describes proper storage and handling procedures. This Section is important and provides many of the dos and don'ts associated with the substance. It will also alert you to situations to avoid when handling or storing the substance.

- **Section X–Information Source and Dates**

The sheet must recite the name, address and telephone number of the person who prepared the data sheet or of some other person who can provide additional information relating to the chemical, such as citations to scientific literature or specialized emergency procedures. The sheet must bear the date of its preparation or of its latest revision.



7.4 MSDS CHECKLIST

	Yes	No
1. IDENTITY		
Does it bear the name of the chemical as it appears on the label?	()	()
Does it bear the chemical name and other names by which the substance is known?	()	()
If it is a mixture, does it bear the name of each component that is hazardous?	()	()
2. CHARACTERISTICS		
Does it describe the chemical and physical properties of the substances?	()	()
3. PHYSICAL HAZARDS		
Does it describe conditions under which fire, explosion, or reaction may occur?	()	()
Does it list other materials with which the substance may come into contact or be exposed to that would result in such hazards?	()	()
4. EXPOSURE HAZARDS		
Does it detail the signs and symptoms of various routes of entry (skin, eyes, ingestion, etc.) as well as various levels of exposure?	()	()
Does it give medical conditions that are likely to be aggravated by such exposure?	()	()
5. PRIMARY ROUTES OF EXPOSURE		
Does it explain the circumstances under which hazardous exposure to the substance typically occurs through various routes?	()	()
6. EXPOSURE LIMITS		
Does it give the exposure limits to the substance set by OSHA or the American Conference of Governmental Industrial Hygienists?	()	()
7. CANCER RISKS		
Does it indicate whether or not the substance is listed as a cause of cancer by OSHA, by the International Agency of Research in Cancer or National Toxicology Program ?	()	()
8. USE AND HANDLING		
Does it specify:		
Methods of preventing fire, explosion, or reaction?	()	()
The proper protective equipment to be worn?	()	()
Proper ventilation procedures?	()	()
Special circumstances under which special protective measures are necessary?	()	()
Procedures for guarding against spillage?	()	()
Proper storage and labeling procedures?	()	()



Actions that are prohibited for the purpose of reducing risks? () ()

9. CONTROL MEASURES

Does it specify:

Methods of diluting the substance? () ()

Methods of ventilating the area in which the substance is used? () ()

Personal protective gear to be worn? () ()

10. EMERGENCY AND FIRST AID PROCEDURES

Does it specify:

The proper responses to exposure through various routes, at various levels and according to the severity of signs and symptoms? () ()

Proper response to fire, explosion and spillage? () ()

Proper procedures for disposal of spilled materials? () ()

11. DATE

Does it show the date it was prepared the date of its latest revision? () ()

12. FURTHER INFORMATION

Does it include the name, address, and telephone number of someone who can be contacted for further information about the substance and for emergency procedures? () ()

13. GENERAL

If certain information is not given, does it state that the information is not available instead of having blank spaces? () ()

Is it written so that employees can be trained to read and understand it? () ()



7.5 MSDS REQUEST

DATE OF REQUEST _____

DEPARTMENT _____

TO: _____

FROM: _____

I hereby request that I be given the Material Safety Data Sheets on the following hazardous substance(s):

Date Received _____

Acknowledge _____ (Requesting Employee)

DEPARTMENT MANAGER _____

DATE _____



SECTION 8 LABORATORY CHEMICAL HYGIENE PLAN (CHP)

ABRIDGED VERSION

*Consult the Chemistry and/or Biology Depts. for a complete copy
of the CHP and Appendices*

**(Applies To Laboratories Of The Department Of Biology, Laboratories Of The
Department Of Chemistry, And Any Other Laboratory That Meets The Definition Of
“Laboratory Scale” And “Laboratory Use Of Hazardous Chemicals”.)**

- 8.1 Purpose & Scope**
- 8.2 Responsibilities**
- 8.3 Basic Safety Practices**
- 8.4 Exposure Control Measures**
- 8.5 Employee Information and Training**
- 8.6 Medical Evaluation and Consultation**
- 8.7 Recordkeeping**
- 8.8 Prior Approval**
- 8.9 Special Precautions**
- 8.10 Waste Identification and Disposal**

Revised: April 2005
Date Accepted: April 2002



8.1 PURPOSE & SCOPE

A. Introduction

William Rainey Harper College is morally and legally obligated to provide a safe working environment for all its employees and students. Since Harper employs workers engaged in the laboratory use of hazardous chemicals, the College will comply with the provisions of the Occupational Safety and Health Administration (OSHA) standard: 29 CFR§1910.1450, Occupational Exposure to Hazardous Chemicals in Laboratories. This standard is often referred to as the OSHA Lab Standard.

B. History of the OSHA Lab Standard

On November 25, 1983, the **Occupational Safety and Health Administration (OSHA)** published the **Hazard Communication Standard**, which applied to certain laboratories and to certain industrial manufacturers. This standard is often referred to as **HazCom**. After careful review OSHA later determined that laboratories typically differ from industrial operations in their use and handling of hazardous chemicals and that a different approach was warranted to protect the safety of laboratory workers.

On January 31, 1990 the Department of Labor published in the Federal Register an amendment identified as **29 CFR§1910.1450, Occupational Exposure to Hazardous Chemicals in Laboratories**. This standard is often referred to as the **OSHA Lab Standard**. The effective date of the Lab Standard was May 1, 1990. A part of that standard is the requirement for the development of a Chemical Hygiene Plan. The **Chemical Hygiene Plan (CHP)** must have been developed and implemented by January 31, 1991.

C. Purpose

The primary **purpose** of the Laboratory Standard is to provide a means to protect laboratory workers from exposure to hazardous chemicals. The Standard requires Harper College to develop a written plan, called the **Chemical Hygiene Plan**, which details how the College will control exposure to hazardous chemicals. The administrative and engineering controls utilized by Harper College are to be uniquely designed to fit Harper laboratories' specific circumstances and procedures. In other words while the **Hazard Communication Standard** (which exempts laboratories) details the information to be provided to employees about hazards, the **Laboratory Standard** leaves the design of the program up to Harper College management. The **Laboratory Standard** supersedes all other OSHA health standards for (1) skin and eye contact, (2) permissible exposure limits (PELs), and (3) action levels. The **Laboratory Standard** does not supersede or replace other OSHA regulations, such as those dealing with fire, electrical, or reporting.

The **Laboratory Standard** applies to all employers of laboratory workers, both private and public. In Illinois, the **Illinois Department of Labor** regulates **public** employers (such as Harper) and enforces all provisions of OSHA regulations including the Laboratory Standard. This authority is granted under Illinois Compiled Statutes 820 ILCS 220 (Safety Inspection and Education Act), 820 ILCS 225 (Health and Safety Act) as well as 820 ILCS 255 (Toxic Substances Disclosure to Employees Act).

D. Definition of a Hazardous Chemical

A **hazardous chemical** is any element, compound, or mixture that has physical or health hazards associated with it.



E. Definition of a Laboratory

A **laboratory** is a facility where relatively small quantities of chemicals are used on a non-production basis. **Laboratory use** of hazardous chemicals means the handling or use of hazardous chemicals in which **all** of the following conditions are met:

1. **Chemical manipulations are carried out on a “laboratory scale”;** employees work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person,
2. **Multiple chemical procedures or chemicals are used,**
3. **The procedures involved are not part of a production process, and**
4. **Protective laboratory practices and equipment are available and in common use to minimize the potential for employee exposure to hazardous chemicals.**

The Laboratory Standard applies to all laboratory employees, other employees who routinely visit or occasionally work in the laboratory, and all contractors who might be exposed to laboratory hazards while on site.

At Harper College, the OSHA definition of a laboratory includes teaching laboratories and laboratory preparation and storage rooms.

F. Scope of the Chemical Hygiene Plan

At Harper College the Laboratory Standard shall apply to the laboratories of the Department of Chemistry and the Department of Biology. Currently the Department of Physical Science does not meet the Lab Standard definition of a laboratory, but it is possible that changes in curriculum would place that department under the Laboratory Standard.

The Chemical Hygiene Plan does not apply to uses of hazardous chemicals that do not meet the definition of laboratory use. Hazardous chemical usage not covered by the Chemical Hygiene Plan is subject to the full provisions of the OSHA Hazard Communication Standard and the Harper College Hazard Communication Program.

Harper employees in **all** other work areas are **not** covered by the **Laboratory Standard** but **are** covered by the **Hazard Communication Standard**. For example, Harper employees in the academic departments of nursing, cardiac technology, dental hygiene, art, electronics, refrigeration and air conditioning, fire science technology, manufacturing technology, and park and grounds operation management fall under the Hazard Communication Standard and not the Laboratory Standard. Non-academic areas such as the print shop, roads and grounds, custodial and maintenance are also covered under the Hazard Communication Standard but not the Lab Standard. If those other non-laboratory employees use hazardous chemicals, the Hazard Communication Standard requires Harper College to train the employees in chemical hazards and personal protection. The **Hazard Communication Standard** requires Harper College to evaluate the potential hazards of chemicals, and train the employees in chemical hazards and personal protection. The **Hazard Communication Standard** requires Harper to (1) develop and maintain **Material Safety Data Sheets (MSDSs)** on the hazardous chemicals present in the workplace, (2) label containers of chemicals, (3) distribute MSDSs to employees, and (4) develop and implement an employee training program regarding hazards of chemicals and protective measures.



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The Hazard Communication Program is covered in a separate section of the Harper College Environmental Health & Safety Procedure Manual. The Chemical Hygiene Plan applies only to laboratory employees in the departments of Biology and Chemistry.

G. Introduction to the Chemical Hygiene Plan

Harper College is required to develop and carry out the provisions of a written **Chemical Hygiene Plan (CHP)** tailored to protect laboratory employees from the health and physical hazards of the chemicals present in the lab and to provide information and training needed to protect employees from those hazards. The CHP must be readily available to employees. Harper must review and evaluate the effectiveness of the plan at least annually and update the plan as necessary.

The basis of the plan is an evaluation of the hazards of the chemicals used in the laboratory. Harper must provide a workplace where laboratory procedures and equipment conform to generally accepted laboratory safety practices. Other requirements of the plan include (1) standard operating procedures that include safety considerations, (2) criteria for establishing control measures aimed at reducing employee exposure to hazardous chemicals, (3) verification that laboratory fume hoods and other engineering controls are operating properly, (4) provisions for employee information and training, (5) a detailing of circumstances where prior approval for use of a certain laboratory operation, procedure, or activity may be required, (6) provisions for medical consultation, (7) designation of employee responsibilities, and (8) provisions for additional employee protection for work with particularly hazardous substances.



8.2 RESPONSIBILITIES

Responsibilities

See Section 1.4 of the Environmental Health & Safety Procedure Manual (EH&S Manual), which outlines the responsibilities and accountability for all environmental health and safety issues. The following are responsibilities exclusively associated with the CHP:

- **Laboratory Safety Committee**

The Laboratory Safety Committee is an appointed subcommittee of the Facilities Committee. The Laboratory Safety Committee shall review and evaluate the Chemical Hygiene Plan at least annually and update the Chemical Hygiene Plan as necessary. The Laboratory Safety Committee shall review and evaluate laboratory safety inspections performed by the departmental CHO. Currently, the Laboratory Safety Committee consists of Julie Ellefson Kuehn, Sandy Kreiling, Kelly Jones, Jennifer Jennings, Dan Stanford, and Randy Schietzelt.

- **Chemical Hygiene Officer (CHO)**

The OSHA Laboratory Standard requires designation of a Chemical Hygiene Officer. The Department of Chemistry Chemical Hygiene Officer is Kelly Jones. The Department of Biology Chemical Hygiene Officer is Jennifer Jennings. The Chemical Hygiene Officers are responsible for implementation and maintenance of the Chemical Hygiene Plan. The Chemical Hygiene Officer shall have health and safety training provided for and paid by the College.

The departmental Chemical Hygiene Officer is responsible for:

1. Working with administrators and other employees to develop and implement appropriate chemical hygiene policies and practices.
2. Monitoring procurement, use, and disposal of chemicals used in the lab.
3. Ensuring that appropriate audits are maintained.
4. Knowing the current legal requirements concerning regulated substances.
5. Seeking ways to improve the Chemical Hygiene Program.
6. Monitoring that laboratory employees follow the chemical hygiene rules.
7. Providing regular, formal chemical hygiene and housekeeping inspection, including routine inspection of emergency equipment.
8. Determining the required levels of protective apparel and equipment for non-standard operations taking place in the laboratory and ensuring that required items are available and properly used.
9. Ensuring that storage is appropriate for any material being ordered and that appropriate information, such as a Material Safety Data Sheet (MSDS), is provided for each chemical in use.

- **Department Chairs**

The Department of Chemistry chairperson is Julie Ellefson Kuehn and the Department of Biology chairperson is Sandy Kreiling. These chairpersons are responsible for ensuring that laboratory employees comply with the chemical hygiene rules.

- **Laboratory Employees**

Laboratory employees are full-time and part-time faculty and staff who work in the laboratories of the departments of Biology and Chemistry. Included are student aides. Laboratory employees are responsible for planning and conducting each operation in accordance with the college chemical hygiene procedures, developing good personal chemical hygiene habits, and always using the appropriate personal protective equipment, and enforcing College safety policies as they apply to students and one another. Laboratory employees are required to report all accidents, near misses, injuries, illnesses, and unsafe acts and conditions to the departmental Laboratory Chemical Hygiene Officer.



8.2 LAB SAFETY PRACTICES

✓ Basic Safety Practices

Anyone observed not following the practices and precautions listed below should be reported to the departmental Laboratory Chemical Hygiene Officer and/or the Department Chair:

1. Conduct yourself in a responsible manner when working in the laboratory.
2. Know the location of the emergency phone, fire extinguisher, fire blanket, eyewash, safety shower, and first-aid kit.
3. Always wear authorized safety goggles when working with hazardous chemicals. Aprons (or lab coats) and gloves must be worn when handling especially hazardous chemicals such as concentrated acids or alkalis.
4. Shorts, skirts, or sandals should not be worn when working in the lab. Confine loose clothing and tie back long hair.
5. Never bring anything to eat or drink into the laboratory, even when the room is being used for just a lecture or test.
6. Never store food or beverages for consumption in a laboratory refrigerator.
7. Don't wear or bring lab coats, aprons, or gloves into areas where food is consumed.
8. Don't smoke, chew gum or tobacco, handle contact lenses, apply cosmetics, or take medicine while in the laboratory. Wash your hands before conducting any of these activities. Additionally, be aware that open packages of gum, tobacco products, cosmetics, or medicine may absorb chemical vapors.
9. Students and staff must never work alone in the department while using hazardous chemicals.
10. Instructors must avoid working alone in the building. All unattended operations must have lights left on in the room and an appropriate sign placed on the door with the name(s) and phone number(s) to call in case of failure of utility services or any other accident.
11. Know the properties of a chemical before handling it. Read the chemical name on reagent bottles twice—many chemicals have similar names.
12. Avoid unnecessary exposure to chemicals. Promptly remove chemicals if they contact your eyes, skin, or clothing.
13. Never taste a substance used in the laboratory. Never smell a substance by putting your nose over the container. Instead, use your hand to fan the vapors towards your nose.
14. Avoid working with lead compounds and organic solvents if you are pregnant or a man or woman trying to conceive.
15. Never heat a stoppered test tube or flask. Avoid pointing the open end of a test tube toward yourself or others.



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16. Never pipet using mouth suction. Use a rubber bulb or a special pipetting device.
 17. Never insert glass tubing or a thermometer into the hole of a rubber stopper unless it's been pre-split or properly lubricated.
 18. Always add acid to water—never add water to acid.
 19. Always wash your hands before leaving the laboratory.
- The following student safety practices and precautions are posted in each laboratory.

B. Department of Chemistry Student Safety Rules

1. Never work alone in the laboratory
2. Read and study the experiment before coming to lab.
3. Leave extra books and outerwear outside the lab on the coat rack.
4. Leave your key in the lock of your drawer during the lab period.
5. Use only the reagents set out for you by your instructor.
6. Never contaminate the contents of reagent bottles. Pour reagents into your own containers before pipetting them.
7. Never return unused or excess chemicals to reagent bottles.
8. Never keep reagent bottles at your workstation. Return them promptly to the designated area so that others can use them.
9. Follow the instructor's directions for chemical waste disposal.
10. If any large quantity of chemical is spilled, notify the instructor immediately.
11. Don't remove chemicals or equipment from the laboratory. If something is missing from your equipment drawer, notify the instructor.
12. Operate instruments only under the direct supervision of an instructor.
13. Never leave an experiment unattended. Ask someone to watch it if you have to leave.
14. Don't bring radios, tape players, telephones, or headphones into the laboratory.
15. Don't enter the Prep Room or the stock room without permission.
16. At the end of the laboratory period:
 - clean your glassware
 - wipe down your bench-top workspace
 - rinse out the sponge at your workspace and lay it flat by the cup sink
 - remove any debris from your cup sink
 - lock your drawer and return your key to the key rack
 - wash your hands with soap and water



C. Department of Chemistry Special Safety Instructions

1. Always wear authorized safety goggles with vents in place.
2. Never bring anything to eat or drink into the laboratory, even when the room is being used for just a lecture or test.
3. Don't do any of the following while in the laboratory: eat, drink, smoke, chew gum or tobacco, handle contact lenses, apply cosmetics, take medicine
(After you leave the laboratory, wash your hands before conducting any of these activities.)
4. In case of fire, remove yourself from danger and notify the instructor.
5. Notify the instructor if any accident, injury, or near miss occurs, regardless of how small it might seem.
6. Know the location of the emergency phones, fire extinguisher, fire blanket, eyewash, safety shower, and first-aid kit.
7. Perform only authorized lab experiments.
8. Read the chemical name on reagent bottles twice. Many chemicals have similar names.
9. Avoid unnecessary exposure to chemicals. Promptly remove chemicals if they contact your eyes, skin, or clothing.
10. Avoid working with lead compounds and organic solvents if you are pregnant, a man or woman trying to conceive, or a lactating woman.
11. Never taste a substance used in the laboratory.
12. Never smell a substance by putting your nose over the container. Instead, use your hand to fan the vapors toward your nose.
13. Avoid an accident by adding acid to water—never water to acid.
14. Never heat a stoppered test tube or flask.
15. Avoid pointing the open end of a test tube toward yourself or others.
16. Never pipet using mouth suction. Use a rubber bulb or a special pipetting device.
17. Never insert glass tubing or a thermometer into the hole of a rubber stopper unless it's been pre-split.
18. Shorts, skirts, and sandals should not be worn when working in the lab.
19. If your hair is long, tie it back when working with chemicals or flames.
20. Conduct yourself in a responsible manner when working in the laboratory. If someone else's behavior puts you or anyone else in jeopardy, notify the instructor.



D. Department of Biology Laboratory Safety Rules

1. Read your lab books before attempting any procedure. Mistakes can cause serious injuries!
2. All coats and possessions should be kept away from lab materials. Store personal belongings on coat racks and designated side tables.
3. Long hair and loose clothing must be restrained so as to avoid the hazards of entanglement, fire from open flames, flammable solvents, or electrical apparatus. Do not wear sandals while working with hazardous chemicals.
4. Do not eat or drink in lab. Do not place anything in your mouth or touch your eyes until you have thoroughly washed up after class.
5. Safety glasses and aprons or lab coats are to be worn for experiments as specified by the instructor.
6. All laboratory equipment is to be used in the proper manner and for the purpose it was intended. Do only the experiment assigned by the instructor for that day. No unauthorized experimentation is ever to be carried out in the laboratory.
7. Know your solvents, reagents, and chemicals. Flammable liquids should be kept well clear of open flames. Many chemicals are skin and eye irritants. Follow the instructor's directions carefully while using these chemicals. In case of accident, notify the instructor.
8. Know where the first-aid kit, fire extinguisher, eyewash station, safety shower, and emergency telephone are located. Report any injuries to the instructor, no matter how trivial.
9. If anything is lost, broken, or spilled, etc. notify your instructor immediately.
10. Do not store volatile, flammable materials in the refrigerator unit. Follow the instructor's directions for proper storage of materials.
11. Do not touch the gas or air outlet levers at your table, unless instructed to do so by your instructor. If gas is used at your table, make sure the levers are OFF before you leave.
12. Do not introduce foreign material into the electrical outlets.
13. Dispose of all waste materials in the proper manner. Consult the instructor for proper disposal procedure. Broken glass and sharps should be discarded only in their designated containers.
14. Students are responsible for keeping their own work area, including sink, in a neat and orderly condition while working and for cleaning it thoroughly prior to departure from the lab at the end of the period.
15. Don't remove chemicals, equipment, or other materials from the laboratory
16. Students will not work alone in the lab except during specified open-lab periods.



8.4 EXPOSURE CONTROL MEASURES

A. Introduction

- Hazardous chemicals can cause harm when they enter the body in sufficient amounts via inhalation, ingestion, injection, or skin absorption. Harmful effects can also occur by eye or skin contact alone. The nature of the hazardous chemical and the routes by which it enters or contacts the body determines the type of controls that are needed.
- Whenever possible, substitution of less hazardous chemicals should be used as a primary method of preventing adverse effects due to chemical exposure. Properly exhausted fume hoods, other local exhaust ventilation, glove boxes and other special purpose hoods must be used when there is a likelihood of excessive exposure to air contaminants generated by laboratory activity. Used in conjunction with good work practices, properly designed and operated exhaust ventilation is effective in minimizing air contaminant exposure.

B. Exposure Guidelines

- Most chemicals have some guidelines for exposure, such as Threshold Limit Values (TLV) or Permissible Exposure Limits (PEL). When such values exist, they will be used to assist the Manager of Environmental Health & Safety and the departmental Laboratory Chemical Hygiene Officer in determining proper safety precautions, including control measures and safety apparel. Permissible Exposure Limits (PELs) are set by OSHA. Threshold Limit Values (TVs) are established by the American Conference of Governmental Industrial Hygienists (ACGIH).
- When TLV and PEL values differ, Harper College will follow the more conservative TLV exposure limits. The following references contain exposure limits:
 1. Limits for Air Contaminants, Code of Federal Regulations 29 CFR 1910.1000, Table Z1.
 2. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists.
 3. NIOSH Pocket Guide to Chemical Hazards.
 4. Material Safety Data Sheets.

C. Methods to Limit Chemical Exposure

Exposure Control Measures are the actions taken by Harper College to prevent the inhalation, ingestion, injection, or skin absorption of hazardous chemicals.

- Four methods are used to limit chemical exposure:
 1. Elimination of the hazard
 2. Engineering controls;
 3. Administrative controls; and
 4. Personal protective equipment (PPE).

1. Elimination of the Hazard

- The first method used to limit chemical exposure should be the consideration to eliminate the hazard. Planning should include substitution of hazardous substances with nonhazardous, or less hazardous chemicals where possible. Planning should also include using the smallest amount of material that is practical for the conduct of the experiment and the consideration of microscale



procedures. It is important to plan for careful management of the substances throughout their life cycle – from acquisition and storage through safe disposal.

2. Engineering Controls

- Engineering controls include proper laboratory design, adequate ventilation, and the use of other safety devices. Ventilation is the most common and most important form of engineering control used to reduce exposure to hazardous chemicals. There are two types of ventilation: general ventilation and local exhaust.

a. General Ventilation – Prudent practices include the following recommendations for building ventilation design and maintenance:

- The general ventilation system for laboratory operations should be designed such that the laboratory air is continuously replaced. The general ventilation system should provide the laboratories with clean air that has a reasonable temperature and proper humidity, is of appropriate particle level and does not contain any radon or toxic vapors. The American Society of Heating Refrigerating and Air Conditioning Engineers (ASHRAE) recommends 20 cubic feet per minute per person of fresh air in laboratories. Air entering the laboratory should enter gently, with minimal turbulence and at a velocity of less than 50 linear feet per minute from any air supply source grill.
- All air from laboratories should be exhausted outdoors and not be recirculated. The outside air intakes for the building should be in a location that reduces the possibility of re-entrainment of laboratory exhaust.
- The general ventilation system for laboratory operations should be designed such that the laboratory is slightly under negative pressure relative to other parts of the building. Air should flow from the offices, corridors and support spaces into the laboratories. This prevents odors and vapors from leaving the lab and moving to other parts of the building.
- The general ventilation system for laboratory operations should be designed to provide 6-12 air changes per hour. The design should also ensure that the air in the room is thoroughly mixed. The higher exchange rates, typically 10 to 12 air changes per hour is considered the new trend in recommendations and guidelines for air exchanges for laboratory operations, considering the greater awareness associated with the use of chemicals in the laboratory. However, increased cost of energy has caused conflict between the desire to minimize the costs of heating and cooling and the need to provide laboratory workers with adequate ventilation. In any case, the health and safety of individuals should never be compromised for economic reasons.
- The Utilities Department supervisor should maintain and inspect the general ventilation. Laboratory ventilation should be verified by professional engineering analysis upon installation. Exhausted air should be discharged into the prevailing air currents above the building. Particulate filters should be fitted on the outside air intake with airflow monitors to ensure maximum airflow. A filter replacement schedule should be developed.
- The general ventilation system for laboratory operations should not be considered sufficient to prevent the accumulation of chemical vapors. Work done with chemicals with low TLVs or high vapor pressures requires local exhaust such as a fume hood.



b. Local Exhaust (Fume Hoods)

- Local exhaust ventilation systems are intended to capture an emitted contaminant at or near its source before the contaminant has the opportunity to disperse into the workplace air. In laboratories, chemical fume hoods are the most common local exhaust devices. Fume hoods reduce worker exposure to hazardous dusts, fumes and vapors.

- Fume hoods should have their own:
 1. Exhaust system
 2. Permanently mounted airflow monitors
 3. System to indicate poor performance of the hood
 4. Maintenance schedule (see Appendix 7 of the complete CHP) that includes
 - a. examination of exhaust motors and belts
 - b. adequate airflow (face velocity of 80 to 120 linear feet per minute)
 - c. alarm function
 - d. annual tests for velocity measurements and smoke visualization.
 - e. Examination of sash counterweight wires.

- Annually the CHO, in conjunction with the Utilities Department and Manager of Environmental Health & Safety, will certify all fume hoods for proper operation (see Appendix 7 of the complete CHP, Monitoring of Laboratory Fume Hoods). A sticker located above the sash contains the proper sash height, hood face velocity, date of inspection and the inspector's initials. If there are problems with a hood, the Maintenance Department and the Manager of Environmental Health & Safety should be notified.

- Fume hoods are certified annually for proper operation by the departmental CHO, in conjunction with the Utilities Department and the Manager of Environmental Health & Safety. They are monitored routinely by the departmental SHO (see Appendix 7, Monitoring of Laboratory Fume Hoods). The departmental CHO will affix a sticker located above each hood's sash that will contain the proper sash height, hood face velocity, date of inspection and the inspector's initials. If there are problems with a hood, the Maintenance Department and the Manager of Environmental Health & Safety should be notified.

- As a rule, the hood shall be used for all chemical procedures involving substances that meet any of the following conditions:
 1. They have a standard requiring monitoring if the action level will be routinely exceeded.
 2. They are volatile
 3. They have a TLV less than 50 ppm.

- When using a fume hood the worker should be aware that:
 1. The fume hood is a safety backup device to the condensers, traps, or other devices to trap and collect the hazardous vapors and fumes.
 2. A hood is not designed to withstand explosions or as a means of disposal for volatile chemicals.
 3. The hood sash is to be closed or lowered at all times except when adjusting the apparatus inside.



4. Work is to be kept at least 6 inches inside the hood face. (This simple step reduces vapor concentrations at the face of the hood by as much as 90 percent.)
 5. The design of the hood is usually for substances of specific characteristics: venting at the top is for chemicals of low vapor density and venting at the bottom is for high vapor density chemicals.
 6. Hoods are not storage areas for chemicals and equipment. Only one hazardous waste container may be stored in a hood.
 7. The hood must remain “on” at all times when a chemical is inside the hood, regardless of whether any work is being done in the hood.
 8. Reactions with perchloric acid require specifically designed hoods.
- Harper College currently does not have biological safety cabinets, glove boxes, or isolation rooms, all of which provide local exhaust ventilation. These are usually very specialized pieces of equipment. In the event the college does purchase any of this equipment, trained and certified individuals such as manufacturer or distributor representatives must certify it for use annually.

3. Administrative Controls

- Administrative controls are procedural measures that can be taken to reduce or eliminate hazards associated with the use of hazardous materials. Administrative controls include the following:
 1. Institutional Safety Policy
 2. Enforcing rules.
 3. General safety procedures.
 4. Safety Committee
 5. Self-inspection by laboratory workers and supervisors.
 6. Health and safety training and information.
 7. Reference materials.
 8. Chemical use and procedure approval and/or review.
 9. Careful planning of experiments and procedures with safety in mind. Planning includes the development of written work procedures for safe performance of the work.
 10. Procurement, receipt, unpacking, and distribution of chemicals (see Appendices 4 and 5 for the Department of Chemistry and Department of Biology procedures).
 11. Use of labels on hazardous materials.
 12. Substitution of less toxic materials for toxic materials.
 13. Good housekeeping.
 14. Good hygiene (e.g., washing hands and other areas of possible chemical contact).
 15. Prohibition of the storage or preparation of food in areas where chemicals are used or stored.
 16. Prohibition of eating, drinking, and smoking where chemicals are used or stored, and provision of “break” areas for this purpose.
 17. No mouth pipetting.
 18. Provision of adequate training for safe work with hazardous materials to all employees.
 19. Restriction of access to areas in which hazardous materials are used.
 20. Use of signs or placards to identify designated and restricted areas.
- A “**designated area**” means an area that may be **used for work** with “select carcinogens”, reproductive toxins, or substances that have a high degree of acute toxicity. A designated area may be the entire laboratory, an area of a laboratory, or a device such as a fume hood.



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- The designated area shall be placarded, temporarily, with an appropriate warning sign during use of the particularly hazardous substance. Appropriate signs will be:
 1. WARNING! – Carcinogen!
 2. WARNING! – Reproductive Toxin!
 3. WARNING! – Extremely Toxic Chemical!
- A “**restricted area**” means an area where chemicals and/or waste are stored or where preparatory work is done. Access is limited to authorized personnel. See the complete CHP for a list of restricted areas.
- A list with 24-hour emergency contact names and phone numbers of personnel responsible for designated areas should be provided to Harper Police.

4. Personal Protective Equipment (also see Section 6 of the EH&S Manual)

- The use of Personal Protective Equipment (PPE) is necessary when feasible engineering and administrative controls are unavailable or if there is a need to supplement those controls.
- Harper College must supply appropriate Personal Protective Equipment. Harper must also ensure that employees are trained in all necessary aspects of its proper use and care. This training must be documented. It is the responsibility of the employee to be certain that the appropriate equipment is worn when necessary.
- **Hazards Assessment.** The departmental Laboratory Chemical Hygiene Officer is responsible for determining which personal protective devices are required for each task performed by employees. This is accomplished by completing a Hazard Assessment Guide (see Appendix 3 of the complete CHP).
- The following types of PPE are used to minimize inhalation and physical contact exposures:
 - a. Protective clothing:** lab coats, aprons and arm covers.
 - The employee provides the normal clothing worn in the laboratory. Clothing should be worn to minimize exposed skin surfaces from splashed chemicals. Therefore, all lab employees should wear long-sleeve/long-legged clothing and avoid short-sleeved shirts, short trousers, or skirts. Employees should also wear shoes with closed toes rather than open-toed shoes or sandals. Even when there is minimal danger of skin contact with a hazardous substance, lab coats, aprons, or protective suits should be used.
 - Garments contaminated with hazardous materials must not be taken home by employees for laundering. They should be laundered on-site or by a commercial laundry that has been warned of potential hazards. Contact the Manager of Environmental Health & Safety for further instructions.
 - b. Gloves**
 - Hands are the most likely part of the body to come into contact with chemicals. Gloves must be worn when skin contact with chemicals results in irritation, burns, or absorption of the chemical into the blood stream. Gloves must be comfortable and sufficient in length to provide adequate protection. Depending on its intended use, a glove may be designed to provide dexterity, strength, low permeability, resistance to penetration by sharp objects, and protection from temperature changes. Glove material must be compatible with the chemical used. Consult the MSDS for the chemical and the glove manufacturer’s literature. Additional specific information can be found in Appendix 8 of the complete CHP.



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- c. **Eye and Face Protection:** chemical splash goggles, safety glasses, and face shields.
- The departmental Laboratory Chemical Hygiene Officer has the responsibility to assess the potential for eye/face injuries, to train employees on the uses and limitations of PPE, and to ensure that the appropriate eye/face PPE is available and used by laboratory personnel.
 - All eye/face devices must meet the requirements set forth in the ANSI Occupational and Educational Eye and Face Protection Standard (Z87.1).
 - **Chemical Splash Goggles** form the necessary liquid-proof seal around the eyes when working with liquid chemicals. Splash-proof goggles provide superior protection against dust, flying objects, splash, spray, and mist hazards. They should be the first choice for primary eye protection.
 - **Safety Glasses with Side Shields** should be used only when working with solid materials such as dust and flying object hazards. These glasses should not be used when working with liquid chemicals.
 - **Face Shields are worn together with safety goggles to provide maximum protection.** For more hazardous chemicals, corrosives, and hot chemicals, both face shield and goggles should be used.
- d. **Respiratory Protection:** respirators for short-term use or during emergencies may be necessary to supplement existing engineering or administrative controls.
- In order to wear a respirator, employees must comply with Harper's Environmental Health & Safety Manual. Section 6.2, "Respiratory Protection Program".
 - When ventilation is not adequate to provide protection against an inhalation hazard, respiratory protective equipment may be necessary. Respirators can be used only when it is not possible to minimize or eliminate exposure to a contaminant through other means. The selection and use of respirators must be done in accordance with 29 CFR 1910.134. All individuals issued respirators must meet the criteria established in the OSHA standard; these criteria include medical screening, training and fit testing. Respiratory protective equipment cannot be used until proper training has been provided to the wearer. Contact the departmental Laboratory Chemical Hygiene Officer for an evaluation of respiratory protection needs.
 - Respiratory protective equipment may be kept on hand for an emergency. In this situation, all potential users must receive training in its use. In addition, the equipment must be inspected on a monthly basis and this inspection must be documented.
 - In order to wear a respirator users must comply with Section 6.2 Respiratory Protection Program of the EH&S Manual.



8.5 EMPLOYEE INFORMATION & TRAINING

A. General

- The College shall provide employees with information and training to ensure they are aware of the hazards of chemicals in their work area and know how to protect themselves from these hazards.
- All employees will be informed of and trained about the hazards of chemicals in the work area at the time of their initial assignment and prior to (a) work involving new exposure situations (b) changes to standard operating procedures and (c) changes to the Harper College Chemical Hygiene Plan. Refresher training will occur periodically, dependent upon the hazard; however, the time between training sessions will not exceed three years.

B. Employee Information

- The appropriate CHO or Chair shall inform employees of, and provide access to the following information:
 1. Contents and appendices of OSHA Laboratory Standard 29 CFR 1910.1450.
 2. Location and contents of the Harper College Chemical Hygiene Plan and its appendices.
 3. Permissible exposure limits (PELs) of OSHA regulated substances or published exposure limits for other hazardous chemicals where there is no applicable OSHA standard.
 4. Signs and symptoms associated with exposure to hazardous chemicals.
 5. Location and availability of safety reference materials, including MSDSs, for hazardous chemicals.

C. Employee Training

- At a minimum, employee training shall include:
 1. Methods and observations that may be used to detect the presence or release of hazardous chemicals.
 2. Physical and health hazards of chemicals in the work area.
 3. Protective measures used to reduce hazards or exposures.
 4. Applicable details of the Harper College Chemical Hygiene Plan as it relates to their job.

D. Information and Training Responsibilities

- The Manager, Environmental Health & Safety or Dept. CHO will provide general laboratory safety training and hazardous waste training to departments upon request and as otherwise scheduled. The departmental Laboratory Chemical Hygiene Officer will document and maintain records of such training and will track refresher training. (See Appendix 14, Employee Laboratory Safety Training Record).
- The Department Chairperson must identify employees who require training and ensure that they attend the training sessions, including refresher training. The departmental Laboratory Chemical Hygiene Officer will provide on-the-job, lab-specific safety training to laboratory workers.



8.6 MEDICAL EVALUATION & CONSULTATION

Health and Psychological Services will provide medical attention or will refer employees to a designated occupational health clinic or hospital for any of the following:

1. The employee shows signs or symptoms of overexposure to a hazardous chemical. Evidence of exposure may include, but is not limited to:
 - a. direct skin or eye contact with the hazardous chemical
 - b. detectable odor, especially if the chemical in question has a lower TLV than odor threshold
 - c. headache, rash, nausea, coughing, tearing, irritation or redness of eyes, irritation of nose or throat, dizziness, loss of motor dexterity or judgment
 - d. disappearance of some or all of the symptoms when the person is taken away from the chemical area into fresh air
 - e. reappearance of symptoms soon after the person resumes working with the chemical
 - f. complaints from more than one person working in the same area
 2. Exposure monitoring reveals an exposure level routinely above the action level or PEL.
 3. An event takes place in the work area, such as a spill, leak, explosion, or other occurrence resulting in the likelihood of exposure to a hazardous chemical.
- All medical examinations and consultations will be provided without cost to the employee, without loss of pay, and at a reasonable time and place.
 - If an employee seeks medical attention for possible overexposure to hazardous chemicals, the departmental Laboratory Chemical Hygiene Officer must complete an *Incident Investigation Report* (See Section 5 – Incident/Injury Management of the EH&S Manual). If possible, provide the following information to the attending physician:
 1. The identity of the hazardous chemical(s) to which the employee has been exposed.
 2. A description of the conditions under which the exposure occurred.
 3. The signs and symptoms of exposure that the employee is experiencing, if any.Also include this information in the description section of the *Supervisor's Incident Investigation Report*.
 - The health care provider (Health and Psychological Services, designated occupational health clinic, or hospital) should provide the employee a written opinion of the following:
 1. Results of the exam, including any tests conducted.
 2. Any medical condition determined by the exam that may place the employee at increased risk because of the exposure.
 3. Any recommendation for follow-up examination or treatment.
 4. A statement that the employee has been informed of the results of the examination and/or consultation

The written opinion shall not reveal any condition not related to the exposure.

8.7 RECORDKEEPING

A. Records

- William Rainey Harper College will maintain the following records:
 1. *Incident Investigation Report*
 2. Medical examinations and consultations
 3. Exposure monitoring
 4. Training
 5. Fume Hood Evaluations
 6. Control system repair and maintenance
 7. Laboratory inspections
 8. Employee safety complaints
 9. MSDS
 10. Hazardous waste pick-up and disposal records

B. Retention and Storage

- Incident Investigation Reports must be completed and maintained in the Department files for the duration of the worker's employment. All complaints of exposure to a hazardous chemical and any other laboratory accidents and incidents must be documented by completing the *Incident Investigation Report (See Section 5 – Incident/Injury Management of the EH&S Manual)*
- Medical examinations and consultation records, including test results and physicians written opinions, must be maintained in Health and Psychological Services files. These records must be kept, and made available for the duration of the worker's employment plus an additional 30 years. These records are maintained in accordance with 29 CFR 1910.1020 "Access to Employee Exposure and Medical Records."
- Exposure monitoring records, including sampling results and reports, must be maintained in the department's files. These records must be kept, transferred, and made available for the duration of the worker's employment plus an additional 30 years. These records are maintained in accordance with 29 CFR 1910.1020 "Access to Employee Exposure and Medical Records."
- Training records, including handouts, agendas, signed attendance sheets, and certificates of successful completion, must be maintained in the department's files for at least three years. (See Appendix 14, Employee Laboratory Safety Training Record.)
- Fume hood evaluations, repairs, and maintenance records must be maintained in the department's files. The evaluations must be conducted annually. These records must be maintained for a minimum of three years.
- Laboratory inspection records including (but not limited to) eyewashes and safety showers must be maintained in the department's files and updated annually. The records must be maintained for a minimum of three years.
- Material Safety Data Sheets (MSDSs) for every chemical in the laboratory inventory must be maintained in the department files and in a database maintained through Physical Plant.
- Employee safety complaints, including, but not limited to, chemical exposure, inoperative control devices, and defective personal protective equipment, must be maintained in the department's files for the duration of the worker's employment.
- Hazardous waste pick-up and disposal records, including manifests, must be maintained in Physical Plant and Department files.



8.8 PRIOR APPROVAL

In order to protect the health and safety of laboratory employees, building occupants, the community at large, and the environment, certain laboratory activities will require prior approval by the departmental Laboratory Chemical Hygiene Officer and/or Safety Committee. These activities include:

1. New laboratory experiments. Complete the Hazard Assessment Guide, Appendix 3 (also available on the Harper College network "U" drive).
2. New procedures.
3. New equipment.
4. New chemicals, including (but not limited to) particularly hazardous substances.
5. New workspace.
6. Change or substitution of any component. in an approved procedure.
7. Substantial change in chemical amounts.
8. Situations in which one must work alone.
9. Use of unauthorized safety goggles.



8.9 SPECIAL PRECAUTIONS

A. General

- Any chemical should be assumed to be hazardous unless all of the physical and chemical properties are clearly known and appropriate references indicate the material is not hazardous. This section describes the basic hazard classes and suggests procedures for handling hazardous chemicals safely. It is also important to review Material Safety Data Sheets and additional safety information on each hazardous material prior to use.

B. Flammable/Combustible Chemicals

- Flammable chemicals are defined in Appendix 1 of the complete CHP. The following procedures should be applied when handling combustible and flammable chemicals:
 1. Do not allow smoking or other sources of open flame in areas where flammable chemicals are used.
 2. Know the location of fire extinguishers, fire alarms, and emergency exits.
 3. Know the proper use of each type of fire extinguisher in the work area.
 4. Do not expose flammable liquids to potential ignition sources such as Bunsen burners, electric motors or ovens.
 5. Flammable liquids should not be heated with an open flame, hot plate, or uninsulated resistance heater. The preferred sources of heating are a heating mantle, steam bath, or hot water bath.
 6. When shaking flammable liquids in closed containers (separatory funnels), release the pressure frequently or the stopper may be forced out, spraying the chemical.
 7. Do not store flammable liquids in domestic-type refrigerators. An explosion may result. Use only explosion-proof or specifically designed flammable-material storage refrigerators.
 8. Store glass containers of flammable liquids in approved storage cabinets. Do not store with oxidizing agents (e.g. nitric, perchloric, and sulfuric acids).
 9. After opening, transfer containers of flammable liquids in excess of one liter to safety cans or safety cabinets.
 10. Clean up spills immediately (see Appendix 9 of the complete CHP).

C. Explosive Chemicals

- An explosive is a chemical that causes a sudden, almost instantaneous, release of pressure, gas, and heat when subject to sudden shock, pressure, or high temperature. Potentially explosive chemicals that may be found in chemistry and biology laboratories include picric acid and peroxide formers such as low molecular weight ethers.
 1. **Picric Acid (Not currently used at Harper; see the departmental CHO to complete a Hazard Assessment Guide before using.)**
Picric acid is explosive when dry. It should contain at least 10% water and be kept out of contact with metals as much as possible. Before being recapped, bottlenecks and lids should always be wiped with a moist paper towel to prevent the formation of crystals around them. Never allow picric acid to reach a dry state. Never handle picric acid when dry! Call Harper Police to request an expert (disposal company or fire department).



2. Peroxide Formers

Organic peroxides can be formed when low molecular weight ethers are exposed to air. When the peroxides are concentrated by evaporation of the ether, an explosion can occur. The following precautions are recommended when handling peroxide formers:

- a. Ethers are preferably obtained in metal cans or amber poly-coated glass bottles with tight-fitting caps.
- b. Purchase the minimum possible container size for your needs. Keep a minimum amount of material on hand.
- c. All containers should be dated upon receipt and when opened.
- d. "Inhibited" grades (containing small amounts of water, alcohol or butylated hydroxytoluene) can be used longer than "noninhibited" grade, which should be disposed of within a few weeks following exposure to air. Unopened "inhibited" containers should be disposed after one year. Opened "inhibited" containers should be disposed of after 3 months. The purchase of peroxide formers with added inhibitors is encouraged.
- e. Store all ethers and peroxide formers in a cool place and away from direct sunlight. If a refrigerator is used, it must be explosion-proof or specifically designed for flammable material storage.
- f. Avoid the distillation of peroxide formers without first testing for the existence of peroxides in the material. Test strips for testing peroxide content are commercially available from vendors such as Fisher and VWR. If peroxides are present, do not distill the material.
- g. Most explosions with the use of peroxide formers occur when a material is distilled to dryness. Leave at least 10-20% in the container. Stir such distillations with a mechanical stirrer.
- h. To destroy peroxides add approximately 100ml of 5% ferrous sulfate for each liter of material. For smaller volumes, adjust the amount accordingly (1ml of 5% ferrous sulfate for each 10ml of material). Mix (do not shake), and store for pick-up by a professional waste hauler.
- i. Never leave a container with less than 20% of the original volume of ether left in it. Such containers should be given to the departmental CHO for prompt disposal.
- j. Compounds other than ethers can form organic peroxides. The MSDS for all chemicals should be checked to determine if peroxide formation is possible.

D. Compressed Gases

1. General

- Gas cylinders contain either gases or liquefied gases. A variety of hazards may be present, including pressure. Puncture, heat, faulty valves or regulators, or other factors may result in a rapid release of the entire contents. Toxic and corrosive gases represent a significant hazard since physical and health hazards are typically compounded by the pressure hazard. Carefully observe these special precautions:
 - a. Always read the label on the gas cylinder to ensure that you are using the proper gas cylinder required to perform the work.
 - b. Cylinders of compressed gases must be handled as high-energy sources. Handle cylinders carefully and do not roll, slide, or drop. Do not lift a cylinder by its cap.
 - c. Transport large cylinders on wheeled carts approved for this purpose. Cylinders must be capped and secured by a support strap or chain. Do not attempt to take a loaded cylinder cart up or down a stairway.



- d. All uncapped cylinders must be secured independently (not ganged behind a single chain) to a solid element of the lab structure. Carts are not acceptable for supporting uncapped or in-use cylinders.
- e. Never tamper with cylinder valves, force connections, or use homemade adapters. Use only approved equipment. Never repair or alter cylinders, valves, or safety relief devices.
- f. Avoid using a wrench on valves equipped with hand wheels. Never hammer a valve to open or close it. Either of these actions can cause the wheel valve assembly to leak.
- g. Check for gas leaks using a soapy water solution around connections.
- h. Never use oil or grease on oxygen tank valves or fittings.
- i. Never completely empty a compressed gas cylinder. A small amount of pressure prevents contamination on refill.
- j. When a compressed gas cylinder is "empty", turn off the cylinder valve and label the cylinder as empty, and replace the cap.

2. Liquid Nitrogen and Dry Ice

- Liquid nitrogen is a cryogen (fluid used to maintain extremely low temperatures). Some of the hazards associated with cryogenics are fire, pressure, embrittlement of materials, and skin or eye burns (similar to thermal burns) upon contact with the liquid. Dry ice, prepared from liquid carbon dioxide, can also cause burns to eyes and skin. Cylinders containing liquid carbon dioxide also have a pressure hazard and cylinder safety procedures should be followed.
 1. Always wear splash goggles and cryo-gloves when handling liquid nitrogen and dry ice. Gloves should be sufficiently large to be readily thrown off if liquid nitrogen is spilled. If there is a splash or spray hazard, a face shield over the goggles, an impervious lab coat, cuffless trousers, and fully covering, non-lacing shoes should be worn.
 2. Containers and systems containing liquid nitrogen should have pressure mechanisms.
 3. Containers and systems used for dry ice and liquid nitrogen should be capable of withstanding extreme cold without becoming brittle.
 4. Do not use funnels for pouring liquid nitrogen.
 5. Do not transport in passenger elevators.

E. Water Reactives

- A water reactive chemical reacts with water to release a gas that is either flammable or presents a health hazard. Safety precautions include keeping the substance away from water and moisture. When a substance is to be added to water, the procedure should be conducted with caution.
- **Concentrated Sulfuric Acid** is especially dangerous and commonly used in the laboratory. When mixed with water, concentrated sulfuric acid will spatter and liberate heat. Extreme caution must be taken when preparing sulfuric acid solutions. Always add acid to water and not water to acid. Furthermore, the acid should be added slowly, cautiously, and with stirring. With large amounts of sulfuric acid, cool the acid-water mixture in an ice bath.

F. Corrosive Chemicals

- The Resource Conservation and Recovery Act (RCRA) defines a corrosive chemical as a liquid with a $\text{pH} \leq 2$ or > 12.5 . A more practical definition, from a personal protection standpoint, is a strong acid or base that burns, irritates, or attacks tissue, generally through skin exposure. When ingested, these materials can attack the mouth, throat, esophagus, and stomach. Corrosive fumes are considered a respiratory hazard. The primary means of protection from corrosive



chemicals is the use of goggles, gloves, face shields, fume hoods, aprons, laboratory coats, and other chemical resistant clothing. The following rules must be obeyed at all times:

1. Transport strong acids or bases in a protective carrier. Do not handle by the neck alone; support the weight of the bottle from the bottom when handling or pouring.
2. Where possible, use plastic containers instead of glass. Glass containers storing basic solutions should have plastic rather than glass stoppers, as basic material tends to bind or freeze glass.
3. Do not store acids or bases with flammable liquids or oxidizing chemicals. Store nitric acid by itself. Store perchloric acid by itself. Corrosive chemicals are best stored in sealed containers in special ventilated cabinets.
4. Handle corrosive chemicals that also have a respiratory hazard in a laboratory fume hood. Lower the glass partition to protect hands and face.
5. Clearly label all acid or alkali solutions. Replace deteriorated labels.
6. Never add water to acids or alkalis; always add a concentrated or dilute acid or base to water, a small portion at a time. Rinse the outside of the bottle to clean off any drips remaining on the outside of the container. Wipe dry.

G. Perchloric Acid (Not currently used at Harper; see the departmental to complete a Hazard Assessment Guide before using)

- Perchloric acid is corrosive and a very strong oxidizing agent, often used for the hot digestion of a variety of materials. Perchloric acid as used in the cold, dilute form in certain biochemical protocols is relatively safe. It can cause violent explosions if misused or when concentrated above normal commercial strength of 72%. Anhydrous perchloric acid should never be prepared as it is unstable at room temperature and will decompose with a violent explosion. The following rules for use of perchloric acid must be followed at all times.
 1. Do not use perchloric acid in hoods designed for other purposes. Hot perchloric acid work may only be conducted in a rated perchloric acid hood that has a wash down feature and scrubber. A perchloric acid hood must be washed down after each use.
 2. When possible, use alternative techniques not requiring perchloric acid.
 3. Purchase the smallest quantity for your needs and use the minimum amount of material possible.
 4. Store perchloric acid away from all oxidizable materials using a secondary container. Organic compounds that are oxidizable react violently with concentrated solutions of perchloric acid.
 5. All containers of perchloric acid in storage must be inspected frequently. Discolored perchloric acid is dangerous and must be disposed of at once.
 6. Do not store perchloric acid on wooden lab furniture or cracked or porous bench-tops. If the acid spills and absorbs into the wood at room temperature, it is still dangerous, as the acid may burn or explode when it dries into anhydrous perchloric acid.
 7. Do not attempt to clean up spills of concentrated perchloric acid yourself as contact with oxidizable materials can cause immediate explosion. The anhydrous acids can explode instantly when a drop is poured on paper or wood. If you spill perchloric acid call Harper Police; they will contact a professional to clean up the spill.

H. Radioactive Substances

- **Ionizing Radiation** is radiation with sufficient energy to remove electrons from atoms. One source of ionizing radiation is the nuclei of unstable atoms. For these radioactive atoms (also called radionuclides or radioisotopes) to become more stable, the nuclei eject particles and high-energy photons (gamma rays).



The major types of radiation emitted are alpha particles, beta particles, and gamma rays. X-rays, another major type of ionizing radiation, arise from processes outside the nucleus.

1. Alpha particles rapidly lose energy when passing through matter and do not penetrate very far. These particles do not penetrate skin but are very harmful when inhaled or ingested. Alpha particles are stopped by a sheet of paper.
 2. Beta particles are more penetrating than alpha particles, but are less damaging over equally traveled distances. Some beta particles can penetrate the skin but are generally more hazardous when inhaled or ingested. Beta particles can be stopped by thin plastic or metal.
 3. Gamma rays can easily pass through the human body or can be absorbed by tissue. Tissue is damaged when it absorbs gamma radiation. Several feet of concrete or a few inches of lead may be required to stop the more energetic gamma rays.
 4. X-rays have generally the same properties as gamma rays. X-rays are generally lower in energy and therefore less penetrating than gamma rays. A thin sheet of lead can stop most x-rays.
 - Depending on the level of exposure, ionizing radiation can pose a health risk. Ionizing radiation can increase the risk of cancer or genetic defects. Evidence of injury from low or moderate doses of radiation may not show up for several months or even years. If the dosage is large enough to cause massive tissue damage, it may lead to death within a few weeks of exposure. Ionizing radiation may also cause harmful genetic mutations that can be passed on to future generations.
1. Chronic exposure is exposure to low levels of radiation over a long period of time (months or years) following initial exposure.
 2. Acute exposure is exposure to a large single dose of radiation. Acute exposure can cause both immediate and delayed effects.
 3. The probability of radiation-caused cancer or genetic effect is related to the total amount of radiation accumulated by an individual. Any exposure to radiation can be harmful, however at very low exposures the estimated increases in risk are small.
 4. Distance from radiation and shielding from radiation may be used to decrease the exposure to radiation.
 - Radiation is measured in several different units.
 1. Rad is a measure of the dose in terms of the energy absorbed per unit of body mass. One rad corresponds to the absorption of 100 ergs per gram of tissue.
 2. Rem is a measure of the dose that estimates the effect on biological tissue. Not all radiation has the same biological effect. The rem dose is found by multiplying the rad dose by a quality factor (Q) that is unique to the type of radiation. For beta particles, gamma rays, and X-rays, 1 rad = 1 rem. For alpha particles, 1 rad = 20 rem.
 3. The curie (Ci) is a measure of the number of radiation disintegrations per second. One Ci is the quantity of radioactive material that will have 37,000,000,000 transformations per second. Often radioactive activity is



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expressed in smaller units such as the millicurie (mCi, 0.001 Ci) or microcurie (μ Ci, 0.000001 Ci).

- The Illinois Department of Nuclear Safety (IDNS) and several federal agencies regulate ionizing radiation. The Environmental Protection Agency (EPA) issues standards to limit human exposure to ionizing radiation. The Nuclear Regulatory Commission (NRC) implements the EPA standards and regulates civilian use of nuclear materials in nuclear power plants and other users of nuclear materials such as educational institutions, hospitals, and industries. The Department of Health and Human Service's Food and Drug Administration (FDA) establishes standards for X-ray machines and other electronic products to ensure that human health is protected from the radiation produced by these products. The Department of Energy (DOE) is responsible for the disposal system for spent nuclear fuel from civilian nuclear power plants and also for the disposal of radioactive materials associated with nuclear weapons. The Department of Defense (DOD) is responsible for the safe handling and storage of nuclear weapons and other military uses of nuclear energy. The Department of Transportation (DOT) governs the packaging and transport of radioactive materials. The Occupational Safety and Health Administration (OSHA) develops and enforces regulations to protect workers not covered by other agencies from radiation exposure.
 - The Nuclear Regulatory Commission (NRC) has set limits on exposure for workers in 10CFR20.1201. For adult employees there is an annual limit of 5 rem (full body exposure) and 50 rem (eyes, skin, arms and internal organs). Employees under age 18 must not receive more than 10% of the adult dose limits. Limits for the public are 0.5 rem per year (10CFR20.1301).
 - The Nuclear Regulatory Commission (NRC) and the State of Illinois regulate radioactive materials. The NRC licenses the manufacture and use of radioactive material. See Title 10 of the Code of Federal Regulations (10CFR).
 - Part 20 of 10CFR specifies standards for protection against radiation. This details regulations for the use, storage, and disposal of radioactive materials. For example caution signs are not required when the radiation level at 30 cm from the source does not exceed 0.005 rem per hour (10CFR 20.1903). Containers do not need caution labels when quantities are less than amounts specified by Appendix C of Part 20 of 10CFR.
1. The Harper College Department of Chemistry has purchased sealed samples of polonium-210, strontium-90, and cobalt-60. Appendix C of 10CFR Part 20 exempts these materials from caution labels when there is no more than 0.1 μ Ci of polonium-210, no more than 0.1 μ Ci of strontium-90, and no more than 1.0 μ Ci of cobalt-60. **Harper's samples do not exceed these limits and therefore do not require caution labels.**
 2. In addition the Department of Chemistry has purchased manufactured devices that contain radioactive materials. These include a smoke detector, a mantle for a camping lantern, a clock with a glow-in-the-dark dial, and a dinner plate. The Department of Chemistry also possesses several rocks and minerals that contain naturally occurring radioactive atoms. The radioactive devices and rocks are used for demonstration purposes.
- The Nuclear Regulatory Commission issues two types of licenses: General License and Specific License. A General License grants authority to a



person for certain activities and is effective without the filing of an application. A Specific License is issued to a named person who has filed an application for the license.

1. **General License:** A "general license" is issued to manufacturers if the manufacturer provides reasonable assurance that:
 - a. the device can be safely operated by persons not having training in radiological protection
 - b. under ordinary conditions the radioactive material will not be released or inadvertently removed from the device, and it is unlikely that any person will receive in 1 year a dose in excess of 10 percent of the annual limits
 - c. under accident conditions it is unlikely that any person would receive a radiation dose in excess of a specified limit

In addition, each device must have:

- d. a durable, clearly visible label approved by the Commission
 - e. instructions and precautions necessary to assure safe operation
- 1 **Specific License:** The NRC may issue a "specific license" for specific licensed materials. However any person is exempt from the requirements for a specific license to the extent that the person possesses materials in concentrations not in excess of those listed in 10CFR 30.70. For example no specific license is needed for cobalt-60 if the concentration does not exceed 5×10^{-4} $\mu\text{Ci/mL}$.

▪ **Use of Radioactive Materials at Harper College**

1. **Materials covered under NRC General License:** Radioactive Materials that are covered under the NRC General License may be used by students and employees at Harper College provided that the following precautions are taken:
 - a. The radioactive material bears a label approved by the Nuclear Regulatory Commission
 - b. written Instructions and precautions necessary for the safe installation, operation, and servicing are available
 - b. the employee has reviewed and understood the instructions and precautions
2. **Materials covered under NRC Specific License but present in Exempt Concentration:** Radioactive Materials in Exempt Concentrations may be used by students and employees at Harper College under the following conditions:
 - a. the radioactive material bears a label approved by the Nuclear Regulatory Commission
 - b. written Instructions and precautions necessary for the safe installation, operation, and servicing are available
 - c. it is recommended that the employee complete a course on the safe handling of such materials before using them
3. **Radioactive Materials requiring a NRC Specific License:** Radioactive Materials requiring an NRC Specific License may not be used at Harper College unless present in exempt concentration.

I. **Toxic Chemicals and Chemicals of Unknown Toxicity**

- Toxic chemicals have the ability to cause damage to living tissue, impairment of the central nervous system, severe illness or, in extreme cases, death when ingested, inhaled, or absorbed by the skin. The amounts required to produce these results vary widely with the nature of the substance and the time of exposure to it. "Acute" toxicity refers to exposure of short duration (a single brief exposure). "Chronic" toxicity refers to exposure of long duration (repeated or prolonged exposure).



- Toxicity is objectively evaluated on the basis of test dosages made on experimental animals under controlled conditions. Most important of these are the LD₅₀ (lethal dose 50%) and the LC₅₀ (lethal concentration, 50%) tests, which include exposure of the animal to oral ingestion, skin contact, or inhalation of the material under test. A substance, when administered orally to rats, that has an LD₅₀ of less than 50mg/kg of body weight is considered highly toxic. A substance, when administered by continuous skin contact to rabbits, that has an LD₅₀ of less than 200mg/kg of body weight is considered highly toxic. A substance, when administered by continuous inhalation to rats, that has an LC₅₀ of less than 200ppm for a gas or vapor or less than 2mg/L for a mist, fume, or dust is considered highly toxic. See Appendix 2 for more information about toxicity classifications. Of the many toxic chemicals used in laboratory, the following pose special concern.
 1. **Cyanides.** Avoid contact of cyanide solutions with acids. Acids react with cyanides to produce hydrocyanic acid vapor, which is potentially lethal. Do not dispose cyanide solutions into drains; cyanides should be accumulated for off-site disposal.
 2. **Mercury.** Mercury is extremely toxic in almost all forms (organic and inorganic compounds as well as the metal). Mercury should be stored in plastic, airtight containers, away from direct heat or sunlight, and at as close to ambient temperature as possible. Every laboratory should do a mercury assessment to determine their sources of mercury and ensure that they have the appropriate spill clean-up procedures in place. Do not dispose mercury into the trash or into drains; mercury should be accumulated for off-site disposal.
 3. **Chemicals of Unknown Toxicity.** All substances of unknown toxicity used in the laboratory must be considered highly toxic and handled according to the guidelines for particularly hazardous substances below. Appropriate personal protective equipment and engineering controls should be utilized.

J. Particularly Hazardous Substances

- The OSHA Laboratory Standard requires laboratories to have procedures in place for handling hazardous substances (flammables, corrosives, toxins, etc.) that are routinely used in the laboratory. Furthermore, the OSHA Laboratory Standard requires additional provisions for employee protection while working with "particularly hazardous substances". These substances include select carcinogens, reproductive toxins, and highly toxic materials.
 1. **Select Carcinogens.** A select carcinogen is any substance that meets one of the following criteria:
 - a. It is regulated by OSHA as a carcinogen; or
 - b. It is listed under the category "known to be carcinogens" in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (latest edition); or
 - c. It is listed under Group 1 ("carcinogenic to humans") by the International Agency for Research on Cancer Monographs (IARC) (latest edition); or
 - d. It is listed in either Group 2A ("probably carcinogenic to humans") or 2B ("possibly carcinogenic to humans") by IARC or under the category "reasonably anticipated to be carcinogens" by NTP, and causes statistically significant tumor evidence in experimental animals.
 2. **Reproductive Toxins.** Reproductive toxins are any substance that has an adverse effect on various aspects of reproduction, including fertility, gestation, lactation, and general reproductive performance. They include chemicals that cause chromosomal damage (mutagens) and physical defects in a developing fetus during pregnancy (teratogens).
 3. **Highly Toxic Materials.** A substance administered orally having an LD₅₀ of less than 50mg/kg of body weight is considered highly toxic. A substance



administered by continuous skin contact having an LD₅₀ of less than 200mg/kg of body weight is considered highly toxic. A substance administered by continuous inhalation having an LC₅₀ of less than 200ppm of gas or vapor or less than 2mg/L of mist, fume, or dust is considered highly toxic. See Appendix 2 for more information about toxicity ratings.

- The following provisions shall be considered when working with particularly hazardous substances:
 1. **Establishment of a designated area.** A designated area may be defined as a fume hood, glove box, isolation cabinet, work area, or entire laboratory. The purpose of the designated area is to isolate the worker from particularly hazardous substances during transfer operations, weighing, dilution, reacting, sieving, purifying, or distilling. The designated area must be placarded with appropriate warning signs (see Subsection C3, Administrative Controls, in Section 4, Exposure Control Measures, of this document).
 2. **Development of Standard Operating Procedures.** For work involving particularly hazardous substances, standard operating procedures should be developed that identify use of containment devices such as fume hoods or glove boxes, decontamination procedures, emergency procedures, storage procedures, inventory control, and waste disposal. Harper College's procedures are listed in Appendices 10 and 11, Departments of Chemistry and Biology Handling Of Particularly Hazardous Substances.
 - **Employee Qualifications for Working with Particularly Hazardous Substances.** Information and training are required under the Laboratory Standard. By definition, training is required for all of the physical and health hazards listed by OSHA under the Hazard Communication Standard, 29 CFR 1910.1200. Any employee must be given training in working with any substance defined above (carcinogens, reproductive toxins, and highly toxic chemicals). Training must include safe handling procedures, the use of personal protective equipment, and the use of the safety equipment in the designated area. The employee qualifications for working with these substances should include a passing grade on a test designed to measure the employee's knowledge of laboratory safety with regard to these substances.

K. Additional Information

- b. *"Prudent Practices in the Laboratory"* contains information regarding working with hazardous substances. A copy is located in the Department of Chemistry Prep Room, D255, and the Biology Lab Assistant's Office, D275a. See the departmental Laboratory Chemical Hygiene Officer regarding safety questions and concerns.



8.10 WASTE IDENTIFICATION & DISPOSAL

A. Regulatory Overview

- The U.S. Environmental Protection Agency regulates hazardous waste under the Resource Conservation and Recovery Act, commonly known as RCRA. Enacted in 1976 and modified in 1978, 1980, and 1984 (by the Hazardous and Solid Waste Amendments) RCRA established a “cradle-to-grave” system for managing hazardous wastes. This means that from the time a hazardous waste is created until it is finally destroyed, a paperwork trail makes sure someone is responsible for safeguarding it. The law also provides specific requirements for those who generate, transport, treat, store, or dispose of hazardous wastes. Training personnel in hazardous waste management and emergency procedures is required under RCRA.
- Other regulations that govern the disposal of waste into the air and the sewer system include the Clean Air Act, the Clean Water Act, and the Safe Drinking Water Act. Consult the departmental Laboratory Chemical Hygiene Officer for identification, collection, storage and disposal of laboratory wastes.

B. Waste Identification

- Common laboratory wastes include:
 1. **Spent solvents, acids, bases and oxidizers** used in extractions, cleaning or other processes.
 2. **Unused reagents and other chemicals** that are no longer needed, do not meet specifications, are contaminated, have exceeded their storage life or are otherwise unusable in the lab.
 3. **Waste oils.**
 4. **Other miscellaneous materials**, including broken thermometers, heavy metal salts, toxins, etc.
- Common laboratory waste regulations require that hazardous waste be accurately identified. **Hazardous wastes** may be identified as either “**listed wastes**” (appear on lists of specific chemicals defined as hazardous waste issued by the EPA) or “**characteristic wastes**” (exhibit certain characteristics defined by the EPA including ignitability, corrosivity, reactivity and toxicity). The departmental Laboratory Chemical Hygiene Officer is available to assist with hazardous waste identification.

C. Nonhazardous and Nonregulated Waste

- Waste that is not regulated by RCRA because it does not exhibit any of the hazardous characteristics (ignitability, corrosiveness, reactivity, or toxicity) as defined by the EPA and is not listed as hazardous by the EPA should be segregated from hazardous waste. The common laboratory wastes usually not regulated as hazardous include:
 1. **Certain salts** such as potassium chloride and sodium carbonate.
 2. **Natural products** such as sugars and amino acids.
 3. **Inert materials** such as uncontaminated chromatography resins and gels.
- When safe and allowed by regulation, disposal of nonhazardous waste via the normal trash or sewer (down the drain of laboratory sinks) can substantially reduce disposal costs. This is the kind of waste segregation that makes economic as well as environmental sense. Always check with the departmental Laboratory Chemical Hygiene Officer prior to disposing any chemical in the normal trash or down the drain in laboratory sinks.

D. Storage and Disposal of Hazardous Waste

- Regulations require that hazardous wastes be accumulated and stored in properly managed containers on sufficiently impervious surfaces (free of cracks, gaps, etc.). Hazardous waste in laboratories may be stored in satellite accumulation containers.



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Once a satellite accumulation container is filled, it must be dated and transferred within three days to a main accumulation area. The departmental Laboratory Chemical Hygiene Officer will coordinate storage and contact the Physical Plant for pick up and disposal by a professional waste hauler. **Disposal of hazardous wastes in laboratory sinks, in the normal trash or by evaporation into the atmosphere is strictly prohibited by law.**

E. Storage and Disposal of Nonhazardous Waste

- The local municipality regulates the **disposal of non-hazardous waste in the normal trash**. Certain precautions should be observed when disposing of non-hazardous waste. Because custodians, who usually empty the trash containers, are not usually familiar with laboratory operations, no objects that could cause harm to them should be disposed of in those containers. Sharp metal and broken glassware, even though they may be considered non-hazardous trash, should be collected in specially marked containers. Empty chemical bottles should be rinsed and collected into a large cardboard box and clearly labeled "empty chemical bottles" and stored with normal trash for pick up.
- The Metropolitan Water Reclamation District regulates the **disposal of non-hazardous waste into the sewer system** (down the drain of laboratory sinks). Certain chemicals may be permissible for sewer disposal. These include aqueous solutions that readily biodegrade and low-toxicity solutions of inorganic substances. Water-immiscible chemicals and organic solvents should never go down the drain. Water-miscible flammable liquids are prohibited from disposal in the sewer system. Collect acetone rinsates in a beaker and then store in a satellite accumulation container.

F. Labeling of Hazardous Waste

- Containers that accumulate and store hazardous waste must be labeled with the following information:
 1. The words "Hazardous Waste".
 2. The waste type in words (spent non-halogenated solvents, waste oil, solid metal waste, etc.).
 3. The date upon which the container became filled.
- Containers must be closed at all times, unless waste is being added or removed. Containers must be in good condition. There may not be severe rusting, dents or other conditions that could cause leaks. Flammable waste jugs must have the flame arrestor in place and in good condition. Containers must be compatible with the hazardous waste stored within them. The use of peanut butter jars and plastic pop bottles is not acceptable. Containers must be inspected by laboratory personnel to ensure that they are properly labeled, in good condition and meet the criteria described above.

G. Waste Minimization

- Federal law requires generators of hazardous waste to implement measures to limit and reduce the volume and toxicity of hazardous waste. Laboratory waste minimization techniques include:
 1. Process/equipment adjustment or modification;
 2. Toxic material substitution;
 3. Waste segregation, separation, concentration; and
 4. Recycling.
- Where possible, microchemistry will reduce waste volume and has the added benefit of minimizing health and safety concerns.



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- The exercise of prudence in ordering new chemicals will also ensure that excess chemicals do not become subject to disposal as hazardous waste. Always check the inventory prior to purchasing any new chemicals. Only purchase the quantities that are needed. Furthermore, always obtain and review Material Safety Data Sheets for any new substances. MSDSs contain disposal instructions as well as toxicity information that you may want to consider before actually purchasing a new chemical. Follow departmental procedures outlined in Appendix 5 purchasing new chemicals.

H. Training

- Laboratory personnel whose duties or activities involve the management of laboratory waste are required to receive hazardous waste training within 6 months of the start of such activities and annually thereafter. Initial and refresher training is offered by the Chemical Hygiene Officer as well as the Manager of Environmental Health & Safety.

I. Sources for Additional Information

- Appendices 12 and 13 of the complete CHP describe the identification, collection, minimization techniques, and disposal procedures for waste accumulated in the Departments of Chemistry and Biology.
- The Environmental Protection Agency (EPA) has excellent resource material to assist with waste minimization. You may access the EPA Home Page at the following address: <http://www.epa.gov>
- Contact the Manager of Environmental Health & Safety or the Chemical Hygiene Officer if you have additional questions or concerns.

***Consult the Chemistry and/or Biology Depts.
for Appendices 1-14***



SECTION 9—CONFINED SPACES

- 9.1 Confined Space Entry Procedure**
- 9.2 Permit Required Confined Space Inventory**
- 9.3 Confined Space Decision Flow Chart**
- 9.4 Required Confined Space Permit**

Reviewed: October 2008
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9.1 CONFINED SPACE ENTRY PROCEDURE

A. Introduction

Some workspaces at Harper College are considered to be "confined" because their configurations hinder the activities of any employees who must enter into, work in, and exit from them. In many instances, employees who work in confined spaces also face increased risk of exposure to serious physical injury from hazards such as entrapment, engulfment, and hazardous atmospheric conditions. Confinement itself may pose entrapment hazards, and work in confined spaces may keep employees closer to hazards, such as asphyxiating atmosphere, than they would be otherwise. For example, confinement, limited access, and restricted airflow can result in hazardous conditions that would not arise in an open workplace.

The term "permit required confined space" (i.e., permit space) refers to those spaces that meet the definition of a "confined space" and pose health or safety hazards, thereby requiring a permit for entry.

B. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910.146, Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

C. Definition of Confined Space vs. Permit Required Confined Space

Confined Space (CS) – all 3 of the following conditions must be met:

1. Is large enough and so configured that an employee can bodily enter and perform assigned work and;
2. Has limited or restricted means for entry or exit (examples: tanks, boilers, and pits) and;
3. Is not designed for continuous employee occupancy.

Permit Required Confined Space (PRCS) – an above CS and has **any one or more** of the following:

1. Contains or has a potential to contain a hazardous atmosphere;
2. Contains a material that has the potential for engulfing an entrant;
3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section;
4. Contains any other recognized serious safety or health hazard.

If the hazard can be eliminated, the PRCS may be downgraded to a non-permit CS.

D. Confined Space Hazards

Every confined space must be evaluated for these four types of hazards. The three types of atmospheric hazards are often the most difficult to identify since they are normally invisible.

- **Oxygen-Deficient Atmospheres** The normal atmosphere is composed of approximately 21% oxygen and 79% nitrogen. An atmosphere containing less than 19.5% oxygen shall be considered oxygen-deficient. The oxygen level inside a confined space may be decreased as the result of either consumption or displacement.

There are a number of processes, which consume oxygen in a confined space. Oxygen is consumed during combustion of flammable materials, as in welding, cutting, or brazing. A more subtle consumption of oxygen occurs during bacterial action, as in the fermentation process. Oxygen can also be consumed during chemical reactions such as in the formation of rust on the exposed surfaces



of a confined space. The number of people working in a confined space and the amount of physical activity can also influence oxygen consumption. Oxygen levels can also be reduced as the result of oxygen displacement by other gases.

- **Flammable Atmospheres** Flammable atmospheres are generally the result of flammable gases, vapors, dust mixed in certain concentrations with air, or an oxygen enriched atmosphere.

Oxygen-enriched atmospheres are those atmospheres which contain an oxygen concentration greater than 22%. An oxygen-enriched atmosphere will cause flammable materials such as clothing and hair to burn violently when ignited.

Combustible gases or vapors can accumulate within a confined space when there is inadequate ventilation. Gases that are heavier than air will accumulate in the lower levels of a confined space. Therefore, it is especially important that atmospheric tests be conducted near the bottom of all confined spaces.

The work being conducted in a confined space can generate a flammable atmosphere. Work such as spray painting, coating, or the use of flammable solvents for cleaning can result in the formation of an explosive atmosphere. Welding or cutting with oxyacetylene equipment can also be the cause of an explosion in a confined space and shall not be allowed without a hot work permit. Oxygen and acetylene hoses may have small leaks in them which could generate an explosive atmosphere and, therefore, should be removed when not in use. The atmosphere shall be tested continuously while any hot work is being conducted within the confined space.

- **Toxic atmospheres** may be present within a confined space as the result of one or more of the following:

The Product Stored in the Confined Space

When a product is stored in a confined space, the product can be absorbed by the walls and give off toxic vapors when removed or when cleaning the residual material. The product can also produce toxic vapors which will remain in the atmosphere due to poor ventilation.

The Work Being Conducted in the Confined Space

Toxic atmospheres can be generated as the result of work being conducted inside the confined space. Examples of such work include: Welding or brazing with metals capable of producing toxic vapors, painting, scraping, sanding, etc. Many of the solvents used for cleaning and/or degreasing produce highly toxic vapors.

Areas Adjacent to the Confined Space

Toxic fumes produced by processes near the confined space may enter and accumulate in the confined space. For example, if the confined space is lower than the adjacent area and the toxic fume is heavier than air, the toxic fume may "settle" into the confined space.

- **Mechanical and Physical Hazards**

Problems such as rotating or moving mechanical parts or energy sources can create hazards within a confined space. All rotating or moving equipment such as pumps, process lines, electrical sources, etc., within a confined space must be identified.



Physical factors such as heat, cold, noise, vibration, and fatigue can contribute to accidents. These factors must be evaluated for all confined spaces.

Excavations could present the possibility of engulfment. Employees shall be protected from cave-ins by sloping, benching, or shoring systems when the depth of the excavation is more than four feet, in accordance with 29 CFR 1926.652.

E. Profiling Confined Spaces

- An Inventory for Permit Required Confined Spaces (see Section 9.2) has been conducted. This inventory will be evaluated annually to review for existing or new Permit Required Confined Spaces on campus.
- If new or existing Permit Required Confined Spaces are found report it to the Manager of Environmental Health & Safety.
- Warning sign shall be posted:

DANGER–PERMIT REQUIRED CONFINED SPACE
Authorized Entrants Only

F. Training and Education

Training shall be conducted before initial work assignment begins, training must be provided for all workers who are required to work in or around confined spaces. Additional training is required when (1) the job duties change, (2) there is a change in the permit space program or the permit space operation presents a new hazard, and (3) when an employee's job performance shows deficiencies.

Training will cover the following topics:

- What is a confined space, non-permit confined space and permit-required confined space;
- Hazards associated with confined spaces;
- Use of equipment and methodologies to determine hazards of a confined space
- How to recognize warning signs or symptoms of exposure to a dangerous situation;
- Why the policy was developed NOT TO ENTER PERMIT CONFINED SPACES.

G. No Entry By Harper Employees Into Permit Required Confined Spaces

If there is a occasion were entry into a Permit Required Confined Space by a Harper Employee is required, special training and written permit requirements **MUST** be followed. Entry into a Permit Required Confined Space can only be requested and coordinated by a Supervisor with permission from the Manager of Environmental Health & Safety.

H. Contractors

Contractors are required to follow the Harper College Confined Space Procedures or they must use their own program that is equivalent. Contractors are required to ensure they have trained their employees on all procedures.

Departments must inform outside contractors of the potential hazards that may be encountered during their work at Harper. This includes giving the contractor access to any information available on the confined spaces involved in their project.



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Similarly, the contractor must inform the Department of any changes made to a confined space in the course of their work. Any change, no matter how minor, would require a re-evaluation of the space before entry would again be allowed.



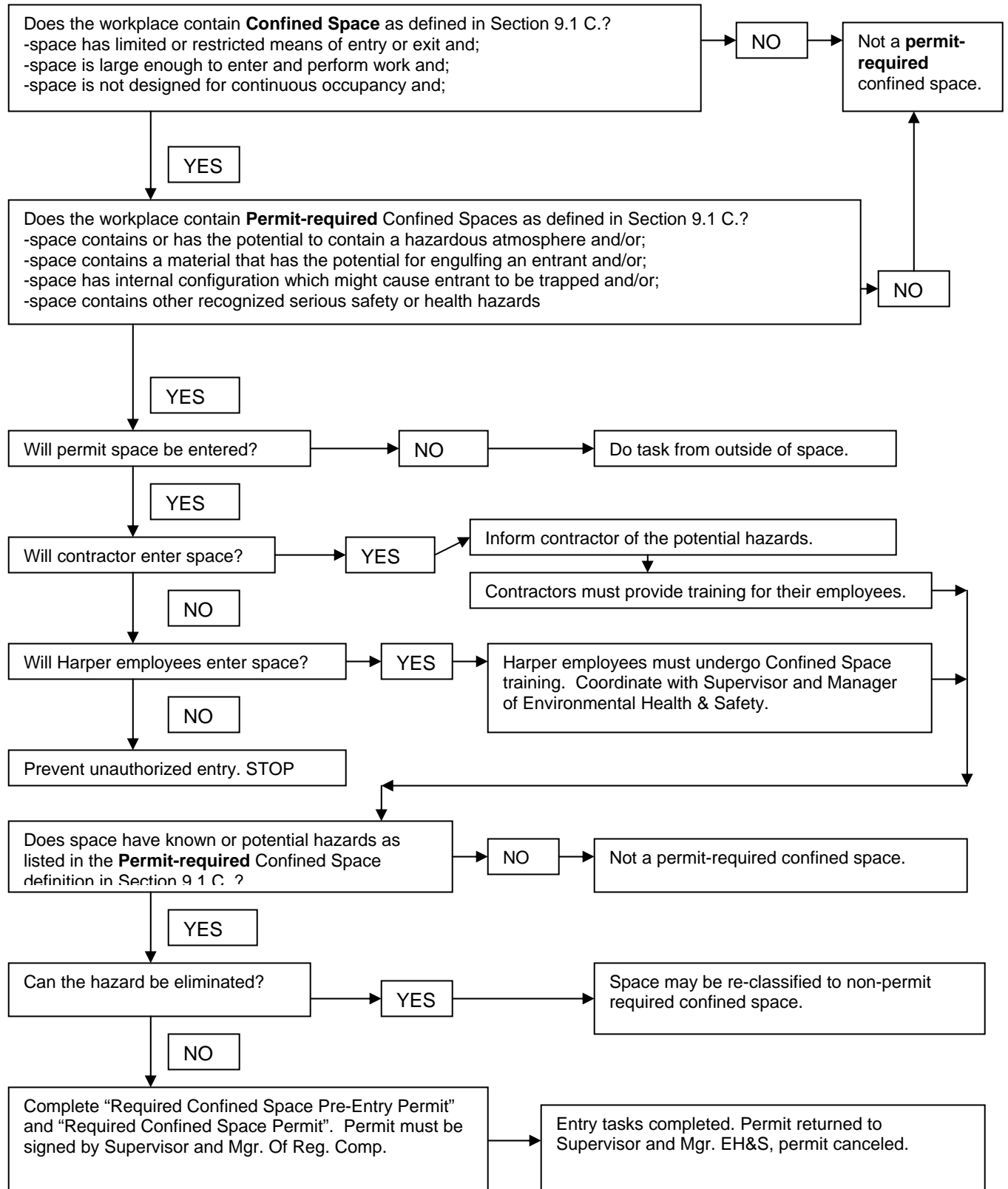
9.2 PERMIT REQUIRED CONFINED SPACE INVENTORY

SPECIFIC LOCATION	PRCS*		TESTING REQUIRED		ENTRANTS IDENTIFIED		TRAINING PROVIDED		AREA SUPV.
	YES	NO	YES	NO	YES	NO	YES	NO	
Boilers (3) Physical Plant Bldg.	X		X			X		X	L. Olson
Tanks Physical Plant Bldg.	X		X			X		X	L. Olson
Tanks "M" Bldg.	X		X			X		X	L. Olson
Below are areas that need to be evaluated for Confined Space status. Depending on conditions and type of work being conducted the status may be "Permit Required" or "Non-Permit Required" Confined Space. Use the Flowchart in Section 9.3 to aid in decision. If still in question see the Manager of Environmental Health & Safety.									
Manholes, sewers, pits, traps and the like - all of campus									J. Goff
Elevator pits all Buildings									J. Goff
Excavations or trenches									
Fountain Pit									
D building hatch - Utilities									

*Permit Required Confined Space



9.3 CONFINED SPACE DECISION FLOW CHART





9.4 REQUIRED CONFINED SPACE PERMIT

Date and Time Issued: _____ Date and Time Expired: _____
 Job Site: _____ Job Supervisor: _____
 Equipment to be Worked on: _____ Work to be Performed: _____
 Harper Supervisor: _____ Contractor: _____

1. Atmospheric Checks: Time _____ Oxygen _____% H2S _____ PPM
 Explosive _____ % L. F. L. Toxic _____ PPM CO _____ PPM

2. Tester's Signature: _____ Instrument Used: _____

3. Source isolation (No Entry): N/A Yes No
 Lockout/Tagout - Pumps or lines blinded, disconnected, or blocked () () ()

4. Ventilation Modification:
 Mechanical () () ()
 Natural Ventilation Only () () ()

5. Atmospheric check after isolation and ventilation: Oxygen _____% 19.5% to 23.5%
 Explosive _____% L.F.L. < 10.0%
 CO _____ PPM <35PPM (TWA for 8 hrs.)
 H2S _____ PPM <10PPM (TWA for 8 hrs.)
 Time _____

6. Communication Procedures: _____

7. Rescue Procedures: _____

8. Entry, standby, and back up persons:
 Name of Entry Person: _____
 Name of Standby Person: _____
 Name of Back up Person: _____

Successfully completed required training?	N/A	Yes	No
Is it current?	()	()	()

9. Equipment:

Direct reading gas monitor-tested	()	()	()
Safety harnesses and lifelines for entry and standby persons	()	()	()
Hoisting equipment	()	()	()
Powered communications	()	()	()
SCBA's for entry and standby persons	()	()	()
Protective clothing	()	()	()
All electric equipment listed Class I, Division I, Group D	()	()	()

10. Periodic Atmospheric Tests:

Oxygen	_____ %	Time	_____	Time	_____	Time	_____
CO	_____ PPM	Time	_____	Time	_____	Time	_____
Explosive	_____ %	Time	_____	Time	_____	Time	_____
H2S	_____ PPM	Time	_____	Time	_____	Time	_____
Toxic	_____ %	Time	_____	Time	_____	Time	_____

We have reviewed the work authorized by this permit and the information contained herein. Written instructions and safety procedures have been received and are understood. Entry cannot be approved if any squares are marked in the "No" column. This permit is not valid unless all appropriate items are completed.

Permit and Check List Prepared By: (Harper Employee or Contractor) _____

Reviewed By: (Harper Supervisor) _____

This permit to be kept at job site. Return job site copy to Mgr. Of Reg. Compliance following job completion.



SECTION 10–ELECTRICAL SAFETY

10.1 Electrical Safety - Work Practices

10.2 Lockout /Tagout Procedure

Reviewed: November 2008

Revised: February 2003

Date Accepted: April 2002

Draft Date: December 2001



10.1 ELECTRICAL SAFETY – WORK PRACTICES

A. Objective

To protect workers from the hazards of exposed electrical circuits through training, procedures such as lockout/tagout, and the use of personal protective equipment.

B. Scope

These work practices apply to those who work near exposed electrical circuits that operate at 50 volts or more.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910, Subpart S (1910.301-399), Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Responsibilities

Workers shall be separated into two broad groups, “qualified persons” and “unqualified persons”. Qualified persons are those who have been trained in avoiding the electrical hazards of working with exposed energized parts, while unqualified persons have little such training. Supervisors should be aware that the training requirements differ for each group, as do the tasks each is allowed to perform.

Department heads shall ensure there is specific training provided for qualified and unqualified workers. Supervisors shall ensure workers receive appropriate training to their assigned tasks and that employees are provided with and use protective equipment and materials.

D. Training

Training is required for anyone who faces a risk of electric shock while performing normal job duties. In addition to training in safety-related work practices, unqualified persons should be trained in the inherent hazards of electricity. Qualified persons should receive additional training that allows them to distinguish live parts from other electrical equipment, measure the voltage of exposed live parts, and determine minimum clearance distances. The training may be in a classroom or on-the-job.

E. Selection and Use of Work Practices

Safety-related work practices should be used to prevent electric shock or other injuries that may result from contact with an energized circuit. Live parts should be deenergized before work begins unless it introduces additional hazards or is unfeasible to do so. Circuits should not be deenergized if it would cause the interruption of life support equipment, deactivation of emergency alarm systems, shutdown of ventilation equipment in hazardous locations, or removal of illumination for an area.

The Harper College “Lockout/Tagout Procedure” (see next section 10.2), should be used to isolate deenergized equipment and circuits. Only qualified persons may apply lockout or tagout procedures and test circuits to verify deenergization.

Special procedures should be followed whenever work is done near energized equipment and circuits, especially overhead power lines. Consideration should be given to housekeeping procedures, lighting, and the conductivity of materials and equipment. The hazards of confined spaces should be considered when work is done in manholes or underground vaults.



F. Use of Equipment

Safety-related work practices should be followed when using cord and plug connected equipment and extension cords. Equipment should not be raised or lowered by its electrical cords. Electrical equipment should be inspected before use and, if found defective, removed from service until repaired.

The environment in which electrical equipment is to be used should also be considered. Ground Fault Circuit Interrupters (GFCI) or low voltage tools should be used in conductive work locations. Special equipment may also be required in areas that may contain flammable or ignitable materials or vapors.

G. Personal Protective Equipment

Personal protective equipment, such as nonconductive head protection, eye and face protection, and insulating gloves, may be necessary for protection against electrical hazards.

Insulated tools and handling equipment, such as protective shields, barriers, or insulating materials, should be used when working near exposed electrical conductors.

Signs, tags, or barriers can be used to warn and protect workers. When these techniques do not provide sufficient protection, an attendant should be used.



10.2 LOCKOUT/TAGOUT PROCEDURE

A. Objective

To prevent the possibility of employee injury from the unintended release of energy or machine motion.

B. Scope

This procedure establishes the minimum requirements for the lockout of energy isolating devices. It shall be used to ensure that the machine(s) or equipment is isolated from all potentially hazardous energy, before employees perform servicing, setup, or maintenance activities. Potential energy sources that must be considered and addressed within the scope of this procedure are:

Electrical	Compressed Gas	Hydraulic Systems
Natural Gas	Bottled Gas	Fuel Oil
Gravity	Stored Spring Tension	

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910.147, Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Responsibilities

- Department supervisors with assistance from appropriate technical support will make a survey to locate and identify isolating devices to be certain which switch(es), valve(s) or other energy-isolating devices apply to the equipment to be locked out. More than one energy source (electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy sources) may be involved.
- Department supervisors working with the appropriate technical support will develop lockout procedures using the following format (see table 10.2):
 - Name of equipment/machine and manufacturer.
 - Type(s) and Magnitude(s) of energy and hazards.
 - Name(s)/Job Title(s) of employees authorized to lockout.
 - Name(s)/Job Title(s) of affected employees and how to notify.
 - Type(s) and Location of energy-isolating means.
 - Type(s) of Stored Energy Methods to dissipate or restrain.
 - Method(s) Selected—i.e., locks or additional safety measures, etc.
 - Type(s) of Equipment checked to ensure disconnection.
 - Name(s)/Job Title(s) of employees authorized for group lockout.



E. Training

Training shall be provided to ensure that the purpose and function of the energy control program and understood by employees and that the knowledge and skills required of the safe application, usage, and removal of energy controls are required by employees.

1. Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.
2. Each affected employee shall be instructed in the purpose and use of the energy control program.
3. All other employees whose work operations are or may be in an area where energy control procedures may be utilized, shall be instructed about the procedure, and about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.
4. Supervising departments shall maintain a current list of authorized employees. A copy of the list of authorized employees shall be forwarded to the Manager of Environmental Health & Safety.

Retraining is required for all employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures, or revealed by inspection.

The retraining should re-establish employee proficiency and introduce new or revised control methods and procedures, as necessary.

Documentation of training and/or retraining must be kept on file. At a minimum the documentation should include a signed statement by both the trainer and the trainee as to: what was taught, date of training and how the training was conducted.

G. Procedures of Lockout/ Tagout (ALL 6 steps must be followed)

1. **Prepare for Shutdown:** Notify all affected employees that servicing or maintenance is required on a machine or equipment and that the machine or equipment must be shut down and locked & tagged out to perform the servicing or maintenance. The authorized employee shall identify the type and magnitude of the energy that the machine or equipment utilizes, to understand the hazards of the energy, and the methods of how to control the energy.
2. **Machine or Equipment Shutdown:** If the machine or equipment is operating, shut it down by the normal stopping procedure (depress stop button, close valve, open switch, etc.)
3. **Machine or Equipment Isolation:** De-activate the energy isolating device(s) so that the machine or equipment is isolated from the energy source(s).
4. **Lockout & Tagout Device Application:** Lockout and tagout the energy isolating device(s) with assigned individual lock.
5. **Stored Energy:** Stored or residual energy (such as capacitors, springs, elevated machine members, hydraulic systems, and air, gas, steam or water pressure, etc.) must be dissipated or restrained by grounding, repositioning, blocking bleeding down, etc.
6. **Verification of Isolation:** Authorized employee shall verify that isolation and deenergization of the machine or equipment have been accomplished. The equipment is now locked and tagged out.

In the preceding steps, if more than one individual is required to lockout or tagout equipment, each shall place his or her own personal lockout or tagout device on the energy-isolating device(s). When an energy-isolating device cannot accept multiple



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locks, a multiple lockout device (hasp) may be used. If lockout is used, a single lock may be used to lockout the machine or equipment, with the key being placed in a lockout box or cabinet, which allows the use of multiple locks to secure it. Each employee will then use his or her own lock to secure the box or cabinet. As each person no longer needs to maintain his or her lockout protection, that person will remove his or her lock from the box or cabinet.

H. Restoring Machines or Equipment to Normal Operations

After the servicing and/or maintenance are completed and equipment is ready for normal production operations:

1. Check around the machines or equipment and the immediate area to ensure that no one is exposed and that tools have been removed, guards have been reinstalled, and employees are in the clear.
2. Verify that the controls are in neutral.
3. Remove the lockout-tagout device(s) and reenergize the machine or equipment.
4. Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.

I. Emergency Removal of Padlock

In the event a lockout device must be removed by anyone other than the person who installed the lockout, the supervisor will comply with the following steps and document in writing to the Manager of Environmental Health & Safety.

1. Verification that the authorized employee who applied the lock is not at the facility.
2. Supervisory personnel have made reasonable efforts to contact the authorized employee to inform him/her that the lock will be removed.
3. Supervisory personnel will inform the authorized employee(s) of the removal before the employee resumes work.
4. The employees have made certain that all of the requirements for restoring power are followed.

F. Tagout

It is not allowed to only use the tagout procedure as a method of controlling an energy source.

J. Exclusions

1. Work on cord and plug-connected electric equipment for which exposure to the hazards of unexpected energization or start up of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing;
2. Minor tool changes and adjustments, and other minor servicing activities, which take place during normal production operation, if they are routine, repetitive, and integral to the use of the equipment, provided that the work is performed using alternative measures which provide effective protection, and ;
3. Hot tap operations involving transmission and distribution systems for substances such as gas, steam, water, or petroleum products when they are performed on pressurized pipelines, provided that the supervising department demonstrates to the satisfaction of the Manager of Environmental Health & Safety, that 1) continuity of service is essential; 2) shutdown of system is impractical; and 3) documented procedures are followed, and special equipment is used which will provide proven, effective protection for employees.

Table 10.2 - Locations/Equipment Requiring LO/TO Procedures – (non-comprehensive – other locations are possible)

Name of equip./mach.	Type & Magnitude of energy and hazard	Name & Title of employee authorized to lockout	Name/Title of affected employees and how to notify	Type(s) and Location of energy-isolating means	Type(s) of stored energy methods to dissipate or restrain.	Method(s) selected.	Type(s) of equipment checked to ensure disconnection.	Name/Title of employees authorized for group lockout.
Electrical Panels – lighting outlets	Electrical	Trained Maintenance & Utilities	Maintenance, Utilities, Contractors, - radio, team meeting	Electrical Panels/ breakers	Electrical – activate circuit	Always activate circuit/switch or machine to confirm correct circuit and LO/TO	Volt meter	Trained Maintenance & Utilities personnel
Piping – Steam Water	Steam	Trained Maintenance & Utilities	Maintenance, Utilities, Contractors, - radio, team meeting	Steam - valves	Steam - drain	Drain off - valve	Gage	Trained Maintenance & Utilities personnel
Hard wired machines – Maint. Wood shop and L126	Electrical	Trained Maintenance & Utilities	Maintenance, Utilities, Contractors, - radio, team meeting	Electrical Panels/ breakers	Electrical – activate circuit	Always activate circuit/switch or machine to confirm correct circuit and LO/TO	Volt meter	Trained Maintenance & Utilities personnel
Pumps & Air Handlers	Electric, water	Trained Utilities	Maintenance, Utilities, Contractors, - radio, team meeting	Electrical Breaker Gas or steam valves	Electrical – activate circuit Steam – drain Gas - drain	Always activate circuit/switch Drain off - valve	Volt meter Gage	Trained Utilities personnel
Boilers	Steam Electric Natural Gas Compressed Air	Trained Utilities	Maintenance, Utilities, Contractors, - radio, team meeting	Electrical Breaker Gas or steam valves	Electrical – activate circuit Steam – drain Gas - drain	Always activate circuit/switch Drain off - valve	Volt meter Gage	Trained Utilities personnel



SECTION 11–POWERED INDUSTRIAL TRUCKS

- 11.1 Powered Industrial Truck Procedure**
- 11.2 Forklift Inspection**
- 11.3 Operator Performance Evaluation Checklist**

Revised: May 2009
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Revised: August 2002
Date Accepted: April 2002
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11.1 POWERED INDUSTRIAL TRUCKS

A. Objective

To establish guidelines in the operation and maintenance of powered industrial trucks to reduce the potential for employee injury and to comply with all applicable standards and regulations.

B. Scope

All operators of forklifts, tractors, platforms lift trucks, motorized hand trucks, and other specialized industrial trucks powered by electric motors or internal combustion engines. This program does not apply to compressed air or nonflammable compressed gas-operated industrial trucks, nor farm vehicles, nor to vehicles intended primarily for earth moving or over-the-road hauling. Program components will include:

- Training
- Inspection
- Maintenance
- Safety Rules

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910.178, Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Procedure

Employees whose job requires them to operate a powered forklift or powered industrial truck must comply with the guidelines stated in the following sections. Once an employee has complied with the guidelines and received the required training they will be listed on the *"Approved Forklift Operator List"*. ONLY individuals on the *"Approved Forklift Operator List"* may operate a powered forklift or powered industrial truck.

To obtain keys to the forklift during normal business hours see Dave Lauerma in the Warehouse. After normal business hours see Harper Police.

E. Training

No person shall operate a powered forklift or powered industrial truck until they have been trained and certified. Training is required prior to permitting an employee to operate a powered industrial truck (except for training purposes). Training shall consist of a combination of formal instruction, practical training and evaluation of the operator's performance in the workplace.

I. Training Components:

- Rules of powered industrial truck operation and why these rules exist.
- Special emphasis on loading and unloading, center of gravity, stability, and mechanical limitations.



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- Supervised practice on an operating course that simulates actual conditions, e.g., stacking, loading trucks and unloading.
- Refueling and recharging.
- The types of trucks used in various hazardous locations and environments.
- A combination of oral, written, and operational performance test.
- Frequent refresher training.

II. Operator Performance Evaluation

- Adequate completion of skills tests
- Demonstrates that the operator knows and understands the unit's functional features.
- Demonstrates that the operator is familiar with all safety rules.
- Can identify specific safety factors at a dock and battery recharge station.
- Demonstrates overall driving skills.

F. Refresher Training and Evaluation

Refresher training shall be conducted when any of the following occur:

- The operator has been observed to operate the vehicle in an unsafe manner.
- The operator has been involved in an accident or near-miss incident.
- The operator has received an evaluation that reveals that the operator is not operating the truck safely.
- The operator is assigned to a different type of truck; or
- A condition in the workplace changes in a manner that could affect safe operation of the truck.

An evaluation of each powered industrial truck operator's performance shall be conducted at least once every three (3) years. *See "Operator Performance Evaluation Checklist".*

G. Inspection

Dave Lauerman in the Warehouse or a designated representative will inspect the forklifts each morning and will complete "11.2 Forklift Inspection" form weekly. The campus mechanic will inspect all mechanical aspects of the forklift monthly. All forklift operators must check the vehicle they are using before they use the forklift. If the vehicle is found to be unsafe, it must be reported to the Warehouse (Dave) immediately. No forklift will be operated in an unsafe condition.

H. Forklift Safety Rules

- Only certified drivers authorized by the college and trained in the safe operation of forklift trucks or any powered industrial truck shall be permitted to operate such vehicles. Drivers shall not operate trucks other than those for which they are authorized. Trainees may be authorized to operate trucks provided they are under supervision.



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- Drivers shall check the vehicle before using and if it is found to be unsafe, the matter shall be reported immediately to the Supervisor of Shipping/Receiving & Warehouse, and the vehicle shall not be put into service again until it has been made safe. Attention shall be given to the proper functioning of tires, horns, lights, battery, controller, brakes, steering mechanism, and the lift system of fork lifts (fork chains, cable, and limit switches).
- Vehicle shall not exceed a safe speed, always maintaining a safe distance from other vehicles, and all established traffic regulations shall be observed. For trucks traveling in the same direction, a safe distance may be considered to be approximately 3 truck lengths or preferably a time lapse of 3 seconds before passing the same point. Exercise extreme care when cornering. Sound horn at blind corners.
- No riders shall be permitted on vehicles.
- Stunt driving and horseplay are prohibited.
- Loaded vehicles shall not be moved until the load is safe and secure.
- When leaving a vehicle unattended, the power shall be shut off, brakes set, the mast brought to the vertical position, and the forks left in the down position. When left on an incline, the wheels shall be locked.

NOTE: A powered forklift truck is unattended when the operator is 25 ft. or more away from the vehicle that remains in his or her view, or whenever the operator leaves the vehicle and it is not in his or her view.

- When the operator is dismounted and within 25 feet of the truck still in his or her view, the load engaging means shall be fully lowered, control neutralized, and the brakes set to prevent movement.
- Trucks shall not be driven up to anyone standing in front of a bench or other fixed object of such size that the person could be caught between the truck and the object.
- Operators shall look in the direction of travel and shall not move a vehicle until certain that all persons are in the clear.
- Vehicles shall not be operated on floors, or platforms that will not safely support the vehicle, empty or loaded. Any damage to forklift trucks and/or structures shall be reported immediately to the Warehouse Supervisor and your supervisor.
- Employees shall not ride on the forks of the lift trucks.
- The forks shall always be carried as low as possible, consistent with safe operation.
- Extreme care shall be used when lifting loads.
- Vehicles shall not be driven in and out of highway trucks and trailers at unloading docks until such trucks are securely blocked and brakes set.
- Employees shall not place any part of their body outside the running lines of the forklift truck or between mast uprights or other parts of the truck where shear or crushing hazards exists.
- Employees shall not be allowed to stand, pass, or walk under the elevated portion of any forklift truck loaded or empty.
- The width of one tire on the forklift shall be the minimum distance maintained by the truck from the edge while it is on any elevated dock or platform.



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- Trucks shall not be loaded in excess of their rated capacity.
- No truck shall operate with a leak in the fuel system.
- Extreme care should be taken when tilting loads. Elevated loads shall not be tilted forward except for when the load is being deposited onto a storage rack or equivalent. When stacking or steering, backward tilt shall be limited to that necessary to stabilize the load.
- The load-engaging device shall be placed in such a manner that the load will be securely held or supported.
- Special precautions shall be taken in the securing and handling of loads by trucks equipped with attachments, and during the operation of these trucks after the loads have been removed.
- **NO SMOKING WHILE OPERATING OR REFUELING FORKLIFTS**



11.2 FORKLIFT INSPECTION

INSPECTOR: _____

DATE: _____

FORKLIFT ID/MAKE: _____

HOUR METER READING: _____

	OK	DEFECTIVE	DATE CORRECTED
1. Tires (for cuts, gouges, imbedded objects, and air pressure for pneumatic tires).	_____	_____	_____
2. Steering	_____	_____	_____
3. Foot brake	_____	_____	_____
4. Parking brake	_____	_____	_____
5. Horn	_____	_____	_____
6. Controls	_____	_____	_____
7. Lights	_____	_____	_____
8. Mast, carriage, and attachments (for damaged, loose, missing bolts, or unusual wear on chain guides and insides of mast channels).	_____	_____	_____
9. Forks and fork adjusting slides	_____	_____	_____
10. Name plate, markings, and load limits	_____	_____	_____
11. Operating and warning lights	_____	_____	_____
12. Clutch or creeper control	_____	_____	_____
13. Overhead guard	_____	_____	_____
14. Battery connections and level	_____	_____	_____
15. Fuel line (for leaks and damage)	_____	_____	_____
16. Exhaust system (for sparks, leaks)	_____	_____	_____
17. Directional signals	_____	_____	_____
18. Back up alarm device	_____	_____	_____
19. Dead man brake (seat actuated)	_____	_____	_____
20. Other (loose articles, materials on truck, etc.)	_____	_____	_____

REMARKS: _____



11.3 OPERATOR PERFORMANCE EVALUATION CHECKLIST

Observer's Signature: _____

Date: _____

Operator's Signature: _____

Date: _____

Type of Forklift: Caterpillar (electric) Komatsu (propane) Komatsu (gas)

	<u>Satisfactory</u>	<u>Needs Improvement</u>
1. Follows inspection/ refueling checklist	<input type="checkbox"/>	<input type="checkbox"/>
2. Demonstrates proper use of controls	<input type="checkbox"/>	<input type="checkbox"/>
• Directional controls – turn signals	<input type="checkbox"/>	<input type="checkbox"/>
• Lights	<input type="checkbox"/>	<input type="checkbox"/>
• Steering mechanism	<input type="checkbox"/>	<input type="checkbox"/>
• Tilt forward/ tilt backward	<input type="checkbox"/>	<input type="checkbox"/>
• Raise / lower	<input type="checkbox"/>	<input type="checkbox"/>
• Special attachments	<input type="checkbox"/>	<input type="checkbox"/>
3. Properly secures "Unattended" vehicle	<input type="checkbox"/>	<input type="checkbox"/>
4. Demonstrates competency in basic maneuvering skills	<input type="checkbox"/>	<input type="checkbox"/>
• Starts and stops smoothly	<input type="checkbox"/>	<input type="checkbox"/>
• Maintains proper speed	<input type="checkbox"/>	<input type="checkbox"/>
• Scans effectively	<input type="checkbox"/>	<input type="checkbox"/>
• Uses horn when appropriate	<input type="checkbox"/>	<input type="checkbox"/>
• Keeps body parts within vehicle while in motion	<input type="checkbox"/>	<input type="checkbox"/>
5. Demonstrates competency in picking up a load	<input type="checkbox"/>	<input type="checkbox"/>
• Matches load weight with truck capacity	<input type="checkbox"/>	<input type="checkbox"/>
• Checks load for stability	<input type="checkbox"/>	<input type="checkbox"/>
• Carries load against backrests	<input type="checkbox"/>	<input type="checkbox"/>
• Spaces forks appropriately	<input type="checkbox"/>	<input type="checkbox"/>
6. Demonstrates competency in driving with a load	<input type="checkbox"/>	<input type="checkbox"/>
• Travels with load close to the ground	<input type="checkbox"/>	<input type="checkbox"/>
• Watches for pedestrians	<input type="checkbox"/>	<input type="checkbox"/>
• Drives in reverse with oversized load	<input type="checkbox"/>	<input type="checkbox"/>
• Maintains a safe speed	<input type="checkbox"/>	<input type="checkbox"/>
7. Demonstrates competency in stacking a load	<input type="checkbox"/>	<input type="checkbox"/>
• Approaches the load squarely	<input type="checkbox"/>	<input type="checkbox"/>
• Deposits load safety and squarely	<input type="checkbox"/>	<input type="checkbox"/>
• Withdraws forks without binding	<input type="checkbox"/>	<input type="checkbox"/>
8. Demonstrates Competency in loading/ unloading trailer (only for Cat. truck which operates in warehouse)	<input type="checkbox"/>	<input type="checkbox"/>
• Checks the dock plate	<input type="checkbox"/>	<input type="checkbox"/>
• Checks the condition of the floor	<input type="checkbox"/>	<input type="checkbox"/>
• Checks the trailer chocks, jack stands and brakes	<input type="checkbox"/>	<input type="checkbox"/>
9. For propane truck only: Demonstrates competency in:	<input type="checkbox"/>	<input type="checkbox"/>
• Using seatbelt	<input type="checkbox"/>	<input type="checkbox"/>
• Wearing gloves to change propane tank	<input type="checkbox"/>	<input type="checkbox"/>
• Checking propane gauge	<input type="checkbox"/>	<input type="checkbox"/>



SECTION 12–BLOODBORNE PATHOGENS

- 12.1 Bloodborne Pathogens Procedure**
- 12.2 Exposure Control Plan**
- 12.3 Definitions**
- 12.4 HBV Declination**
- 12.5 Exposure Incident Report**

Reviewed: October 2008
April 2006, April 2002
Revised: December 2001
Revised: May 1996
Date: September 1993



12.1 BLOODBORNE PATHOGENS PROCEDURE

A. Introduction

The Bloodborne Pathogen Program and corresponding Exposure Control Plan has been developed to eliminate or minimize occupational exposure to blood or bodily fluids. The major intent of the program is to prevent the transmission of blood borne diseases within potentially exposed workplace occupations and specifically to reduce and prevent employee exposure to the Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV) and other blood borne diseases.

B. Scope

Current law does not specify which jobs have an occupational exposure. The standard requires the employers evaluate the jobs and make the determination if any such exposures exist.

However, occupational exposure means "reasonably anticipated" contact between skin, eye, mucous membrane or potential contact and blood or other potentially infectious material that may result from the performance of the employees' job duties. Further, reasonably anticipated includes the potential for exposure as well as actual exposures.

Employees trained in first aid or CPR would not be included simply because they have received medical training. Employees would be covered if they were trained and designated to respond to medical emergencies as part of their job duties.

"Trained and Designated" means that the employer has made an employee responsible for rendering medical assistance as part of his/her job function.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910.1030, Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Responsibilities

- The Director, Health and Psychological Services is responsible for the implementation of the Exposure Control Plan.
- The Manager, Environmental Health & Safety will assist the Director of Health and Psychological Services in implementation of the program. The Manager, Environmental Health & Safety will maintain and update the written Bloodborne Pathogen Program when necessary.
- The Custodial Supervisor will have the responsibility for written housekeeping protocols and will ensure that effective disinfectants are purchased.
- The Director of Health and Psychological Services will be responsible for ensuring that all medical actions required are performed and that appropriate medical records are maintained.
- The Director of Health and Psychological Services, the Manager, Environmental Health & Safety and/or a designated training representative shall be responsible for providing training.
- Departmental Supervisors will be responsible for documentation of training and making the written Exposure Control Plan available to employees.



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- Each Department Supervisor will maintain and provide all necessary personal protective equipment (PPE), engineering controls (i.e., sharps containers, etc.), labels and red bags as required by the standard.
- Each Department Supervisor will ensure that adequate supplies of the aforementioned equipment are available.
- Employees who are determined to have occupational exposure to blood or other potentially infectious materials (OPIM) must comply with the procedures and work practices outlined in the Exposure Control Plan.

E. Procedures

- The Exposure Control Plan (ECP) shall be made available to employees covered by the plan. The ECP and a copy of the regulations along with training shall be provided to employees.
- Employees with work activities covered in the ECP shall be offered the Hepatitis B vaccination (HBV) along with training on the safety, benefits and efficiency within 10 days of initial assignment. The HBV shall be administered by Health and Psychological Services at no cost to the employee. Health and Psychological Services will keep Record keeping of the HBV.
- Department Supervisors shall ensure employees are provided training and keep records of the annual training on the ECP.
- For questions on the ECP, training or the Bloodborne Pathogen Program contact Health and Psychological Services or the Manager of Environmental Health & Safety.



12.2 EXPOSURE CONTROL PLAN

A. Objective

To establish the Harper College's blood borne pathogen Exposure Control Plan (ECP), train employees, define management responsibilities and develop record keeping requirements.

B. Scope

This Exposure Control Plan (ECP) includes:

- Determination of employee exposure
- Implementation of various methods of exposure control, including: Universal precautions, engineering and work proactive controls, personal protective equipment, and housekeeping.
- Hepatitis B Vaccination.
- Post-exposure evaluation and follow-up.
- Communication of hazards to employees and training.
- Record keeping.
- Procedures for evaluating circumstances surrounding an exposure incident.

C. Employee Exposure Determination

1. The following is a list of all job classifications at Harper College in which **ALL** employees have occupational exposure:

Job Title	Department/Location
Director of Health and Psychological Services	Health and Psychological Services
College Nurse	Health and Psychological Services
Part Time Nurse	Health and Psychological Services
Physician	Health and Psychological Services and HPL
Director, Human Performance Lab	WHP/HPL
Supervisor, Cardiac Services	WHP/HPL
Exercise Physiologist	WHP/HPL
Exercise Technologist	WHP/HPL
Registered Nurse	WHP/HPL
Athletic Trainer	WHP
Assistant Athletic Trainer	WHP



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Job Title	Department/Location
Equipment Manager	WHP
Equipment Room Attendant	WHP
Harper Police Officer	Harper Police
Security Guard	Harper Police

2. The following is a list of all job classifications at Harper College in which **SOME** employees have occupational exposure:

Job Title	Dept./Location	Task/ Procedure
Custodial Staff	Physical Plant	Cleaning specific areas such as Health Service, Dental Hygiene Clinic, Human Performance Lab, Training Room, Laboratories, Bathrooms, and accident sites. Collecting & preparing regular waste for disposal.
Coaches	WHP	First responder only when athletic trainer is unavailable.
Health Career faculty	LS/HS	Those faculty-supervising students in clinical facilities/ areas.

“Good Samaritan” acts which result in exposure to blood or other potentially infectious materials from assisting a fellow employee (i.e., assisting a co-worker with a nosebleed, giving CPR or first aid) are to included in the Bloodborne Standard. However, in such a case, Harper College will offer Post-Exposure Evaluation and Follow-up.

D. Methods of Implementation and Control

Universal precautions will be observed at all facilities. All blood or other potentially infectious material will be considered to be infectious regardless of the perceived status of the source individual. Engineering and work practice controls will be implemented to eliminate or minimize exposure to employees at all sites. Where occupational exposure remains after implementing these controls, personal protective clothing and equipment shall also be worn. All equipment will be inspected and maintained on a regular schedule.

A copy of this **Exposure Control Plan (ECP)** shall be provided during employee’s initial training session. It will also be reviewed during their annual refresher training. All employees will have an opportunity to review this ECP at any reasonable time during their work shift by contacting their supervisors. Employees seeking copies of the ECP may contact the Health and Psychological Services Department. A copy of the ECP will be made available free of charge and within 15 days of the request.

E. Engineering Controls and Work Practices

Engineering controls and work practices controls will be used to prevent or minimize exposure to blood borne pathogens. The specific engineering controls and work practice controls that will be used and where they will be used are listed below:



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- **Locations: Health and Psychological Services, Human Performance Lab, Dental Hygiene Clinic, WHP Division, Athletic Department, Harper Police, Health Career Labs, Biology Labs.**
- **Engineering controls** examples could include removing or isolating the hazard or the worker, i.e., self-sheathing needles, puncture-resistant disposal containers for sharps, ventilation devices, bio-safety cabinets, etc.
- **Work practice controls** would include, but are not limited to:
 - Providing readily accessible hand washing facilities.
 - Washing hands immediately or as soon as feasible after removal of gloves
 - At non-fixed sites which lack hand washing facilities, providing interim hand washing measures, such as antiseptic towelettes and paper towels.
 - Washing body parts as soon as possible after skin contact with blood or other potentially infectious materials.
 - Prohibiting the recapping or bending of needles.
 - Prohibiting shearing or breaking contaminated needles.
 - Labeling with Biohazard label.
 - Decontaminating equipment.
 - Prohibiting eating, drinking, smoking, applying cosmetics or lip balm and handling contact lenses in work areas where there is likelihood of occupational exposure.
 - Prohibiting food and drink from being kept in refrigerators, freezers, shelves, cabinets or on counter tops or bench tops where blood or other potentially infectious materials (OPIM) are present.
 - Performing all procedures involving blood or OPIM in such a manner as to minimize splashing, splattering and generation of droplets of these substances.
 - Placing specimens of blood or OPIM in a container, which prevents leakage during collection, handling, processing, storage, transport or shipping.

Departments shall have specific training on necessary engineering controls and work practices in their area. Departments shall also list engineering and work practice controls to be employed in the area (i.e., sharps containers), inspection and maintenance schedule, and the name of the individual responsible.

F. Personal Protective Equipment (PPE)

Personal protective equipment must be used if occupational exposure remains after instituting engineering and work practice controls, or if controls are not feasible. Training will be provided in the use of the appropriate PPE for the employees' specific job classifications and tasks/procedures they will perform.

PPE will be provided without cost to all occupationally exposed employees and will be selected based on the anticipated exposure to blood or other potentially infectious materials. Protective equipment will be considered appropriate only if it does not permit blood or other potentially infectious materials to pass through or reach the employees' clothing, skin, eyes, mouth, or other mucous membranes under normal conditions and duration of use.



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Appropriate PPE is required for the following tasks:

- Routine patient care
- First Aid
- Laboratory Procedures
- Cleaning Spills

The type and characteristics of PPE will depend upon the task and degree of exposure anticipated.

PPE items include, but are not limited to:

- Latex gloves (or equal type to latex)
- Gowns
- Laboratory Coats
- Face Shields
- Masks
- Eye protection (splash proof goggles, safety glasses with side shields)
- Resuscitation bags and mouthpieces

This equipment will be kept in kits, which will also contain disinfectant towelettes for handwashing and red bags for biohazard-labeled bags. These will be located in all departments where employees are reasonably anticipated to have occupational exposure to bloodborne pathogens.

As a general rule, all employees using PPE must observe the following precautions:

- Wash hands immediately or as soon as feasible after removal of gloves or other PPE.
- Remove PPE before leaving the work area and after a garment becomes contaminated.
- Place used PPE in appropriately designated areas in each department or containers when being stored, washed, decontaminated or discarded.
- Wear appropriate gloves when contact with blood or OPIM can be reasonably anticipated when handling or touching contaminated items or surfaces. Replace gloves if torn, punctured, contaminated, or if their ability to function as a barrier is compromised.
- Wash you hands and any other exposed skin with soap and water as soon as possible. Employees must also flush exposed mucous membranes (eyes, mouth, etc.) with water.
- Utility gloves may be decontaminated for reuse if their integrity is not compromised. The decontamination procedure will consist of cleaning with antibacterial soap and 10% bleach solution.



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- Discard utility gloves when they show signs of cracking, peeling, tearing, puncturing, or deterioration.
- Never wash or decontaminate disposable gloves for reuse or before disposal.
- Wear appropriate face and eye protection such as a mask with glasses with solid side shields or a chin-length face shield when splashes, sprays, splatters, or droplets of blood or OPIM poses a hazard to the eyes, nose or mouth.
- If a garment is penetrated by blood and OPIM, the garment(s) must be removed immediately or as soon as feasible. If a garment becomes minimally contaminated, employees should be trained to remove it in such a way as to avoid contact with the outer surface; e.g., rolling up the garment as it is pulled toward the head for removal. However, if the amount of blood exposure is such that the blood penetrates the garment and contaminates the inner surface, not only is it impossible to remove the garment without exposure to blood, but the contamination itself would constitute exposure. It may be prudent to train employees to cut such a contaminated scrub to aid removal and prevent exposure to the face.
- Repair and/or replacement of PPE will be at no cost to the employees.

G. Training

All employees who have or are reasonably anticipated to have occupational exposure to bloodborne pathogens will receive training conducted Health and Psychological Services staff, the Manager of Environmental Health & Safety or a designated training representative. Department supervisors shall ensure employees receive the training and keep documentation of the training.

Lecture, videos and handouts will be used to inform employees of the epidemiology, symptoms and transmission of bloodborne diseases. In addition, the training program will cover, at a minimum the following elements:

1. An explanation of the OSHA Standard for Bloodborne Pathogens.
2. Epidemiology, signs and symptoms of bloodborne diseases.
3. Modes of transmission of bloodborne pathogens.
4. The Exposure Control Plan, (i.e., points of the plan, lines of responsibility, how the plan will be implemented, etc.)
5. Procedures that might cause exposure to blood or other potentially infectious materials in the workplace.
6. Control methods that will be used at the facility to control exposure to blood or other potentially infectious materials.
7. Personal protective equipment available on the job and who should be contacted concerning such equipment.
8. Post-exposure evaluation and follow-up.
9. Signs and labels used at the facility.
10. Hepatitis B vaccine program of the college.
11. Interactive question and answer session.



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An Employee Education and Training Roster shall be completed for each initial training and subsequent refresher training each year.

H. Hepatitis B Vaccine

All employees who have been identified as having occupational exposure to blood or other potentially infectious materials will be offered the **Hepatitis B vaccine at no cost to the employee**. The vaccine will be offered within 10 working days of their initial assignment to work involving occupational exposure to blood or other potentially infectious materials unless the employee has previously had the vaccine or wishes to submit to antibody testing to prove that the employee has sufficient immunity.

Health Services will provide information on Hepatitis B vaccination, addressing its safety, benefits, efficacy, methods of administration and availability. All employees with occupational exposure are strongly encouraged to receive the Hepatitis B vaccination. Health and Psychological Services will administer the Hepatitis B vaccination to employees who have occupational exposure to blood or OPIM unless:

The employee has previously received the series.

- Antibody testing reveals that the employee is immune.
- Medical reasons prevent taking the vaccination; or
- The employee chooses not to participate.

The employee who chooses not to accept the vaccine must sign the statement of declination of Hepatitis B vaccination (See Section 12.4 of the BBP Program). The statement can only be signed by the employee following appropriate training regarding Hepatitis B, Hepatitis B vaccination, the efficacy, safety, method of administration, and benefits of vaccination, and that the vaccine and vaccination are provided free of charge to the employee. *This statement is not a waiver*; employees can request and receive the Hepatitis B vaccination at a later date if they remain occupationally at risk for Hepatitis B.

I. Post-Exposure Evaluation and Follow-Up

Should an exposure incident occurs, it should be reported immediately to Health and Psychological Services and their Supervisor. An Exposure Incident Report (see Section 12.5 of the BBP Program) shall be completed by the employee who incurred an exposure and signed off by the employee's Supervisor.

All employees who incur an exposure incident will be offered post-exposure evaluation and follow-up in accordance with the OSHA Standard. This follow-up will include the following:

1. Documentation of the route of exposure and the circumstances related to the incident.
2. If possible, the identification of the source individual and, if possible, the status of the source individual. The blood of the source individual will be collected as soon as possible and will be tested, if consent is obtained, for HIV and HBV infection, unless prohibited by State law.
3. If possible, results of the source individual testing will be made available to the exposed employee who will also be informed about the applicable laws and regulations concerning disclosure of the identity and infectivity of the source individual.



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4. If the exposed employee consents to having his or her blood collected but does not consent to HIV serological status testing, the blood sample will be preserved for at least 90 days to allow the employee to decide if the blood should be tested for HIV serological status. However, if the employee decides prior to that time that testing should be conducted, and then the appropriate action should be taken.
5. The employee will be consulted as to the prevention of, or protective treatment for, disease in accordance with current recommendations of the U.S. Public Health Service.
5. Appropriate counseling concerning precautions to take during the post-incident period will be provided by Health and Psychological Services to the employee along with information on symptoms for and the need to report any related experiences to appropriate personnel.

J. Interaction with Health Care Professionals

A written opinion shall be obtained from Health and Psychological Services staff that evaluates employees of the college.

- Written opinions will be obtained in the following instances:
 - When the employee is sent to receive the Hepatitis B Vaccine.
 - Within 15 days from when an employee is sent to Health and Psychological Services following an exposure incident.
- Health and Psychological Services will be instructed to limit their opinions to:
 - Whether the Hepatitis B vaccine is indicated and if the employee has received the vaccine, or for evaluation following an incident.
 - That the employee has been informed of the results of the evaluation.
 - That the employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials.
- The written opinion to the college is not to reference any personal medical information or test results.

K. Housekeeping

Regulated waste shall be placed in containers which are closable, constructed to contain all contents and prevent leakage, appropriately labeled or color-coded (red bags with biohazard symbol), and closed prior to removal to prevent spillage or protrusion of contents during handling.

Contaminated sharps are discarded immediately or as soon as possible in containers that are closable, puncture-resistant, leakproof on the sides and bottoms, and labeled or color-coded appropriately. Sharps containers shall be provided in the same room that syringes are being used (Health and Psychological Services patient rooms and Dental Hygiene classrooms). Sharps containers shall never be manually opened, emptied or cleaned.

Custodial services will pick up regulated waste containers, clean and decontaminate work surfaces. The Custodial Supervisor has developed and implemented a written housekeeping schedule, method of decontamination and location of cleaning supplies. The Custodial Supervisor shall further select the appropriate type of disinfectant. When a commercial disinfectant is not available a solution of freshly made 10% bleach in water solution should be used.



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Broken glass wear that is contaminated shall be picked up by mechanical means such as tongs, forceps or a brush and dust pan; never pick up with hands, even if gloves are worn.

Disposal of regulated waste shall be coordinated by Physical Plant according to all federal, state and local regulations. Contaminated objects (i.e., clothing, equipment and objects), which have been decontaminated by disinfectant, may be reused or disposed in regular trash.

L. Laundry

The following contaminated articles will be laundered:

- Athletic Department towels and uniforms.
- Staff lab coats.

Laundering will be performed by Equipment Room staff in Building M (according to the following requirements and procedures)

- Handle contaminated laundry as little as possible and with minimum of agitation.
- Use appropriate personal protective equipment (PPE) such as gloves and other PPE (i.e., aprons, mask, eye protection) when handling and/or sorting contaminated laundry.
- At the location on contamination, place wet contaminated laundry in leak-proof, biohazard labeled or red bag colored containers before transporting.
- If laundry must be sent off campus to be cleaned, it must be determined if the receiving facility is prepared to handle biohazards by using universal precautions.
- Sharps containers shall be readily accessible due to the incidence of needles and sharps being unintentionally mixed with the laundry.
- Linen soiled with blood or body fluids should be placed and transported in bags that prevent leakage. If hot water is used, linens should be washed with detergent in water at least 140F-160F for 25 minutes. If low temperature (<140F) water is used, chemical suitable for disinfectant should be used.

M. Labeling

The following labeling method(s) will be used at Harper College:

- Fluorescent orange "Biohazard" word or symbol warning labels.
- Red bags/ Containers

Physical Plant will ensure warning labels are affixed or red bags are used as required. Employees are to notify Physical Plant if they discover unlabeled regulated waste.

N. Recordkeeping

Medical Records are maintained for each employee with occupational exposure in accordance with 29 CFR 1910.20. The Health Service staff is responsible for maintenance and storage of the required medical records.

The medical records will include:

- Employee name and social security number.



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- A copy of the employee's Hepatitis B vaccination and any medical records relative to the employee's ability to receive the vaccination.
- A copy of all results of examinations, medical testing and follow-up procedures as required by the Standard.
- A copy of all health care professional's written opinion(s) as required by the Standard.

All employee medical records will be kept confidential and will not be disclosed or reported without the employee's express written consent to any person within or outside the workplace except as required by the Standard or as may be required by law.

Employee medical records shall be maintained for at least the duration of employment plus 30 years in accordance with 29 CFR 1910.20.

Employee medical records shall be provided upon request of the employee or to anyone having written consent of the employee within 15 working days.

The Department Head or a designated representative shall maintain Training Records.

The records shall contain the following:

- The dates of the training sessions.
- The contents or a summary of the training sessions.
- The names of persons conducting the training.
- The names and job titles of all persons attending the training sessions.

Training Records shall be maintained for a minimum of three (3) years from the date on which the training occurred.

Employee's training records will be provided upon request to the employee or the employee's authorized representative within 15 working days.



12.3 DEFINITIONS

Blood –human blood, human blood components and products made from human blood.

Bloodborne Pathogens- pathogenic microorganisms that are present in human blood and can infect and cause diseases in humans. These pathogens include, but are not limited to: Hepatitis B virus (HBV) and Human Immunodeficiency Virus (HIV).

Contaminated- the presence or the reasonably anticipated presence of blood or Other Potentially Infectious Materials (OPIM) on an item or surface.

Exposure Incident- a specific eye, mouth, other mucous membrane, non-intact skin, or potential contact with blood or OPIM that results from the performance of an employee's duties.

Occupational Exposure- reasonably anticipated skin, eye, mucous membrane, or potential contact with blood or OPIM that may result from the performance of an employee's duties.

Other Potentially Infectious Materials (OPIM) –the following body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid visibly contaminated with blood, any body fluid in situations where it is difficult or impossible to differentiate between body fluids.

Regulated Waste – Any of the following:

- 1) Liquid or semi-liquid blood or OPIM;
- 2) Contaminated items that would release blood or OPIM in a liquid or semi-liquid state if compressed;
- 3) Items that are caked with dried blood or OPIM and are capable of releasing these materials during handling;
- 4) Contaminated sharps; and
- 5) Pathological and microbiological wastes containing blood or OPIM.

Universal Precautions – System of infection control where the use of engineering and work practice controls are used whenever a person may come in contact with blood or OPIM .



12.4 HBV DECLINATION

DECLINATION STATEMENT

I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring Hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with Hepatitis B vaccine, at no charge to myself. However, I decline Hepatitis B vaccination at this time. I understand that by declining this vaccine I continue to be at risk of acquiring Hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with Hepatitis B vaccine, I can receive the vaccination series at no charge to me.

Employee Signature

Date

The wording in this declination statement is absolute and may not be changed or amended in any way.



12.5 EXPOSURE INCIDENT REPORT

Routes and Circumstances of Exposure Incident

Name of Employee: _____ Date of Report: _____

Address: _____

Social Security Number: _____ D/O/B _____

Home Phone: _____ Business Phone: _____

Vaccination Status (HBV, Td) _____ Antibody Status: _____

Date of Exposure: _____ Time of Exposure: _____

Where did the incident occur? _____

Nature of the Incident (Auto accident, Patient Care, Medical Emergency) – Be Specific _____

Describe what task(s) you were performing when the exposure occurred – Be Specific:

Were you wearing Personal Protective Equipment (PPE)? Yes _____ NO _____

If yes, list: _____

Did the PPE Fail? Yes _____ NO _____

If Yes, Explain How: _____

What Body Fluid(s) were you exposed to (Blood or Other Potentially Infectious Materials)? Be Specific:

Supervisor Signature: _____ Date: _____

Forward to Health Services – Date: _____



SECTION 13- ERGONOMICS

- 13.1 Ergonomic Procedure
- 13.2 Video Display Terminal (VDT) Checklist
- 13.3 Neutral Position

**Reviewed: June 2009,
October 2008**
Date Accepted: April 2002
Draft Date: December 2001



13.1 ERGONOMIC PROCEDURE

A. Objective

To prevent the occurrence of work-related musculoskeletal disorders (MSD) at Harper College. To inform College personnel about MSD and the risk factors that can cause or aggravate them. The program strives to promote continuous improvement in the workplace including proactive action to minimize the likelihood of injury. The program will identify design principles that prevent exposure to risk factors and stresses education and action on individuals' parts. The program is established to ensure ongoing and consistent management leadership and employee involvement.

B. Scope

This ergonomics program covers musculoskeletal disorders (MSD) in backs, upper and lower extremities. This includes back injuries, cumulative trauma disorders, repetitive strain disorders, etc. These guidelines apply to all College jobs that require more than two hours per day of: performance of the same motion every few seconds such as computer keyboard entry. Other job tasks that require fixed or awkward position (kneeling, twisted or bent back, overhead work, stooping), or use of vibrating or impact equipment or any job-requiring manual handling of 25 pounds or more will be evaluated on a case by case situation.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) Proposed Ergonomic Protection Standard, Federal Register, 1995.

D. Procedure

Reporting of Injury: Known or suspected musculoskeletal disorders (MSD) should be reported the same as any other non-life threatening injury as outline in *Section 5 Incident/ Injury Management* of this EH&S Procedure Manual.

Injury Prevention: This program outlines several ways to work to prevent MSD:

- **Engineering Controls** are the preferred method of controlling ergonomic stresses. Engineering controls include a wide variety of ways to design a workstation so that the workstation can be adjusted to fit the person and the task. Some of the following questions should be asked:
 1. How will the workstation or computer be used? Who will be using the workstation or computer? If the computer will only be used by one person then the workstation can be set to that person's size and shape, but if the workstation is shared the workstation will have to flexible to adjust to all sizes that use the workstation.
 2. What kind of computer will be used? If a desktop is used (where keyboard is separate from the monitor) most guidelines are set for desktop computers. Laptop computers are difficult to get the user in a "neutral position" and recommendations include: docking stations, external monitor and keyboards for use over an extended period of time.
 3. Tools used for tasks shall be designed to prevent or reduce chronic muscle contractions, awkward finger, hand and arm positions, repetitive forceful motions, vibrations, and excessive griping, pinching or pressing with the hand and fingers.



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4. What furniture will you use? Make sure the computer and accessories are placed on stable surfaces with adequate room. What chair will be used? A chair should be comfortable to sit in and provide lumbar support.
 5. Keep frequently used items placed closest to the user so that they can be conveniently and comfortably reached.
 6. Tasks performed by the employee shall be designed to prevent extreme postures, repetitive motion, excessive force and static work.
 7. Use the Video Display Terminal (VDT) Workstation Checklist to help identify correct workstation set-up.
- **Administrative Controls** when applied will be beneficial in the reduction of exposure duration, frequency and severity of exposure. Some administrative controls include the following:
 1. Reduce the number of repetitive motions.
 2. Reduce the force or physical exertion applied to any part of the body.
 3. Rotate employees to different tasks. When rotating an employee to a different task, that new task must use a different group of muscles, tendons and nerves.
 - **Personal Protective Equipment (PPE)** such as gloves, padding, clothing and or other equipment shall be designed for the intended purpose and employees must be trained in the care and use of PPE. See *Section 6 Personal Protective Equipment* of this *EH&S Manual* for additional information. Note: Braces, splints and back belts are NOT considered PPE and when use shall only be at the direction and under the supervision of the employee's treating physician.

E. Training

The Manager of Environmental Health & Safety or a designated training representative will provide training. Training will cover the following:

1. Harper's Ergonomic Program and the employee's role in the program.
2. The signs and symptoms of MSD and how to report injury or illness.
3. The risk factors of MSD
4. Awareness of safe work practices including work methods and techniques the employee can use to minimize the risk of suffering a MSD. Including but not limited going over the VDT Workstation Checklist.

F. Helpful Hints: Arranging Your Workstation

Since the settings for most workstation components are interdependent, a specific sequence of adjustments is not defined. Generally, changing one workstation setting may affect the requirements of other workstation settings, and create the need to modify those other settings. This process is repeated until a satisfactory set up is reached. The following lists the general steps and specific arrangements, which will create a comfortable VDT workstation.

1. Start with an adjustable chair. Adjust your chair seat-pan height to match your individual dimensions. Raise or lower your chair so that your feet reach the floor



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comfortably. Select a comfortable recline and make sure the backrest supports your lower back. If your chair has adjustable armrest, select an armrest height that allows you to fully relax your shoulders. If other workstation arrangements are satisfactory, armrests are usually not necessary. However, some employees may prefer armrests. Chairs should have separate seat and backrest tilt mechanisms, offering a wide range of combined settings.

2. Position your monitor so that the top of the monitor is at least several inches below eye level. Your line of sight to the monitor should be downward. If the monitor is too high, you could: remove the CPU from under the monitor and set the monitor directly on top of the desk or table and/or adjust the desk or table height to further lower the monitor.
3. Position your monitor so that it is close enough to be easy for you to read, but as far away as comfortable. Often, the viewing distance will be at least 20 inches and may be as much as 40 inches depending on the monitor size and character or font sizes produced by your software. Use your software's features to modify character sizes as needed. If direct or reflected glare is a problem, adjust your monitor's tilt to remove the glare. If glare is still a problem, you may need to modify the location of your workstation in relation to light sources or windows. Select an arrangement in which the monitor screen is at a ninety-degree angle from light sources or windows. A glare-reducing filter can also be helpful for cutting down glare.
4. Place your keyboard in the keyboard tray and adjust the height to match your individual dimensions. Be sure that your hand/wrist can align with your forearm when typing. To accomplish this, you can raise or lower the keyboard height, and tilt you keyboard up or down (positive or negative slope). By tilting the keyboard with the back of the keyboard lower than the front you can lower your arms closer to your lap and more fully relax the shoulders. The induced hand/wrist posture is very comfortable for many people. Some users may prefer their keyboard flat, without being tilted. Some points about keyboard tray settings: Be sure that there is adequate thigh clearance space underneath the keyboard tray. Some keyboard trays have adjustment levers or knobs underneath which can interfere with thigh clearance or may be bumped easily with the knee. Modify settings on the keyboard tray until you can work without feeling pain or discomfort at the wrist. Often, small or subtle changes to your keyboard height or tilt can make a large difference in hand/wrist comfort over time.
5. Attach a mouse pad to the right or left of your keyboard tray- depending on whether or not you are right or left handed. The mouse pad should rest at approximately the same height and location as your keyboard, not located on top of a desk, which forces you to reach up and out to perform work with the mouse.
6. Readjust aspects of the workstation, which have been altered by the steps above. As you make changes to your workstation, you may need to revisit some components to readjust them as you repeat the process.
7. Obtain and use a headset if you need to talk on the telephone while typing or keying.
8. Very short employees may require a footrest. If feet do not reach the floor after all adjustments are made, an adjustable footrest can be used.
9. Use a copyholder to create additional desktop space or to improve head/neck posture for reading copy.
10. Provide adequate space for other tasks such as writing, reading copy, or dialing the telephone. Position materials within easy reach depending on the frequency of expected use. For example, if the job entails making frequent phone calls, position



your telephone within easy reach of your left or right hand-depending on whether you are left or right handed.

11. Stretching and exercises can make you feel better. Do them periodically throughout your day.
12. Bifocals or trifocal lens wearers may need special glasses for VDT work. Your eye doctor can advise you.

AFTER COMPLETING THE HELPFUL HINTS COMPLETE THE VDT WORKSTATION CHECKLIST.



13.2 VDT WORKSTATION CHECKLIST

Employee's Name: _____ Date: _____

Department: _____ Ext.: _____

OSHA's VDT (Video Display Terminal) Checklist

WORKING CONDITIONS	YES	NO
The workstation is designed or arranged for doing VDT tasks so it allows the employee's.....		
A. Head and neck to be about upright (not bent down/back).		
B. Head, neck and trunk to face forward (not twisted).		
C. Trunk to be about perpendicular to the floor (not leaning forward/backward).		
D. Shoulders and upper arms to be about perpendicular to floor (not stretched forward) and relaxed (not elevated).		
E. Upper arms and elbows to be close to body (not extended outward).		
F. Forearms, wrists, and hands to be straight and parallel to floor (not pointing up/down).		
G. Wrists and hands to be straight (not bend up/down or sideways toward little finger).		
H. Thighs to be about parallel to floor and lower legs to be about perpendicular to floor.		
I. Feet to rest flat on floor or be supported by a stable footrest.		
J. VDT tasks to be organized in a way that allows employee to vary VDT tasks with other work activities, or to take micro-breaks or recovery pauses while at the VDT workstation.		
SEATING	YES	NO
The chair...		
1. Backrest provides support for employee's lower back (lumbar area).		
2. Seat width and depth accommodate specific employee (seat pan not too big/small).		
3. Seat front does not press against the back of employee's knees and lower legs (seat pan not too long).		
4. Seat has cushioning and is rounded/ has "waterfall" front (no sharp edge).		



5. Armrests support both forearms while employee performs VDT tasks and do not interfere with movement.		
KEYBOARD/INPUT DEVICE The keyboard/input device is designed or arranged for doing VDT tasks so that ...	YES	NO
6. Keyboard/input device platform(s) is stable and large enough to hold keyboard and input device.		
7. Input device (mouse or trackball) is located right next to keyboard so it can be operated without reaching.		
8. Input device is easy to activate and shape/size fits hand of specific employee (not too big/small).		
9. Wrists and hands do not rest on sharp or hard edge.		
MONITOR The monitor is designed or arranged for VDT tasks so that...	YES	NO
10. Top line of screen is at or below eye level so employee is able to read it without bending head or neck down/back. (For employees with bifocals/trifocals, see next item.)		
11. Employee with bifocals/trifocals is able to read screen without bending head or neck backward.		
12. Monitor distance allows employee to read screen without leaning head, neck or trunk forward/backward.		
13. Monitor position is directly in front of employee so employee does not have to twist head or neck.		
14. No glare (e.g., from window, lights) is present on the screen, which might cause employee to assume an awkward posture to read screen.		
WORK AREA The work area is designed or arranged for doing VDT tasks so that...	YES	NO
15. Thighs have clearance space between chair and VDT table/keyboard platform (thighs not trapped.)		
16. Legs and feet have clearance space under VDT table so employee is able to get close enough to keyboard/input device.		
ACCESSORIES	YES	NO
17. Document holder , if provided, is stable and large enough to hold documents that are used.		
18. Document holder , if provided, is placed at about the same height and		

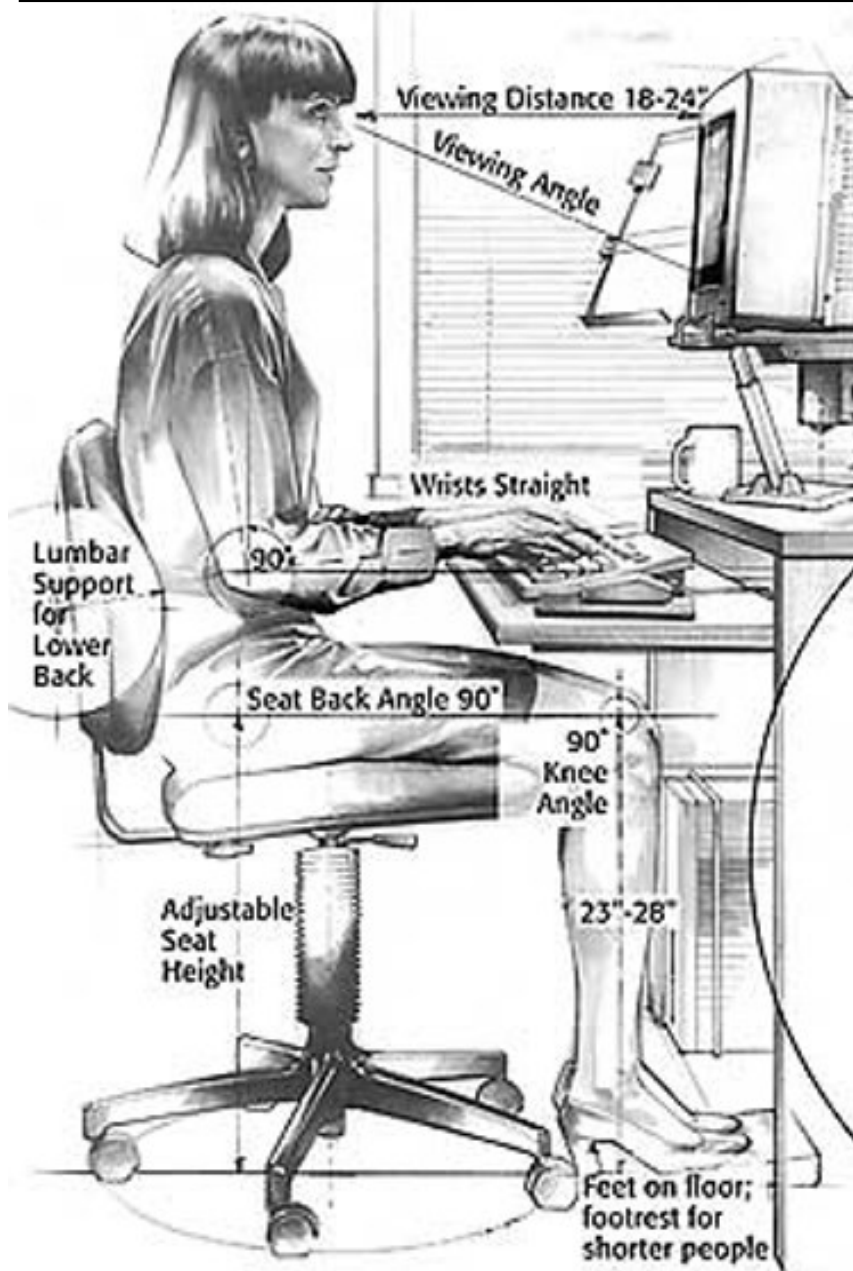


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distance as monitor screen so there is little head movement when employee looks from document to screen.		
19. Wrist rest , if provided, is padded and free of sharp and square edges.		
20. Wrist rest , if provided, allows employee to keep forearms, wrists and hands straight and parallel to ground when using keyboard/input device.		
21. Telephone can be used with head upright (not bent) and shoulders relaxed (not elevated) if employee does CDT tasks at the same time.		
GENERAL	YES	NO
22. Workstation and equipment have sufficient adjustability so that the employee is able to be in a safe working posture and to make occasional changes in posture while performing VDT tasks.		
23. VDT Workstation, equipment and accessories are maintained in serviceable condition and function properly.		
PASSING SCORE = "YES" answer on all "working postures" items (A-J) and no more than two "NO" answers on remainder of checklist (1-23).		
If you DO NOT pass the checklist call the Manager of Environmental Health & Safety at Physical Plant to set up a workstation evaluation.		
If you have reported any pain or discomfort associated with your workstation, call the Manager, Environmental Health & Safety to set up a workstation evaluation.		



13.3 NEUTRAL POSITION





SECTION 14–INDOOR AIR QUALITY **(IAQ)**

14.1 IAQ Concerns

14.2 IAQ Log

Reviewed: October 2008
Date Accepted: April 2002
Draft Date: December 2001



14.1 INDOOR AIR QUALITY CONCERNS

A. Objective

To maintain a healthy and comfortable indoor environment. To accomplish this, Physical Plant will coordinate appropriate and practical proactive, investigative, and corrective measures concerning indoor air quality matters with specific departments.

B. Scope

The scope of this program is extended to the entire campus community. Employees should report Indoor Air Quality (IAQ) deficiencies and complaints to their supervisor, who should in turn report the matter to Physical Plant for corrective measures.

C. References

Illinois Indoor Air Quality Act 410 ILCS 87, Illinois Clean Indoor Air Act 410 ILCS 80, ASHRAE Standard 55-1992 and ASHRAE Standard 62-1999.

D. IAQ Program

The most common origins of IAQ problems arise from a variety of sources inside and outside the buildings. Airborne chemicals, bacteria, fungi, pollen, dust, and vehicle exhaust can all contribute to the problem, as well as other factors such as temperature, humidity, lighting, noise, personal and work-related stress, and pre-existing health conditions. These factors, combinations of the factors and short term unidentified events combine to make identification of a source difficult and sometimes impossible.

A typical investigation of an IAQ complaint should with a call to the Physical Plant. Maintenance or Utilities can investigate and remedy straightforward issues such as incorrectly set or inoperative thermostats, malfunctioning fans, odors from dry floor drains, and transient odors from maintenance activities. If the problem is caused by a more complex situation, such as inadequate ventilation or excessive mold, then the problem may require a more detailed investigation. The Manager of Environmental Health & Safety can conduct this investigation. Sometimes the remedy involves an extensive project and may be delayed by the need for non-routine sources of funding. Some actions building occupants can take to help maintain good IAQ are as follows:

- Report poor indoor environmental conditions (e.g. stuffy air, heat or cooling problems, annoying odors, etc.) to Physical Plant at ext. 6350.
- Report water intrusion into buildings as soon as possible to Physical Plant at ext. 6350 . The longer building materials remain damp the more likely the potential for excessive microbial growth.
- Limit the use of products that produce odors or volatile solvents to specifically designed rooms, preferably with local exhaust ventilation. This also applies to equipment that generates excessive heat or produces odors.
- Minimize generation of dust or aerosols in the work area.
- Maintain good housekeeping in work areas and break areas. Throw away garbage and old food and clean up spills promptly.



- Do not bring in ozone producing devices on campus. Often vendors of ozone producing devices make statements that lead the public to believe that these devices are always safe and an effective in controlling indoor air pollution. In reality these devices have **not** been proven safe in occupied spaces. When inhaled, high concentrations of ozone can damage the lungs and lead to health problems such as throat irritation, coughing, chest pain, and shortness of breath.

If you feel that you are experiencing health effects due to the IAQ report these to your supervisor. If symptoms persist proceed to the Health and Psychological Services for a health evaluation. It is recommended that employees experiencing repeated discomfort keep a log of when the discomforts occur. The log should include some of the following: date, time of day, discomfort, length of time of discomfort, any unusual odors experienced and outside conditions at the time. (*See Section 14.2 of the EH&S Manual*) The recording of events in a log might point to activities taken place inside or outside the building.



SECTION 15–ENVIRONMENTAL MANAGEMENT

Abridged Version

The Harper College Environmental Management Plan (EMP) is a complete manual on Environmental Management. The EMP is published in a separate Manual maintained by the Manager of Environmental Health & Safety. For a copy or information regarding environmental compliance call the Manager of EH&S x6923 or Physical Plant x6950.

15.1 Environmental Management Plan (EMP)

15.2 Waste ID & Disposal

15.3 Hazardous Materials Spills/Release

Reviewed: October 2008
September 2004
Date Accepted: April 2002



15.1 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

A. Objective

To describe and implement a comprehensive Environmental Management Plan (EMP).

B. Scope

Harper College will conduct affairs in a manner that safeguards the environmental health and safety of students, faculty, staff and community. The College will also strive to reduce pollutants released to the air, land, water, and properly dispose of all hazardous and non-hazardous waste. Environmental compliance and continuous improvement in waste reduction is our objective in all college operations.

C. References

Federal Environmental Protection Agency (EPA) Code of Federal Regulation Title 40- Protection of Environment and Illinois EPA -Title 35 of the Illinois Administrative Code. Harper College *Environmental Health & Safety Procedure Manual (EH&S Manual)* and *Chemical Hygiene Plan (CHP)*.

D. Responsibilities

1. All environmental releases, incidents, or problems at any of the Harper College facilities shall be reported in a timely fashion to the Manager of Environmental Health and Safety or the Director of the Physical Plant. The Manager of Environmental Health and Safety or the Director of Physical Plant will report environmental issues to the relevant agency within the time limits imposed by the agencies.

2. Other Supervisors and Department Heads must be aware of their environmental requirements identified within the EMP and shall provide documentation and or reports when requested by the Manager Environmental Health and Safety.

E. Environmental Management Plan (EMP)

The following is an outline of EMP elements:

- Clean Air Act (CAA)
 - Criteria Pollutants, Attainment and Non-Attainment
 - Chlorofluorocarbons (CFCs)
 - Emissions from Mobile Sources
 - Air Toxics Rules and Hazardous Air Pollutants (HAP's)
 - Emission Reports & Permit
- Clean Water Act (CWA)
 - Spill Prevention, Control and Countermeasures (SPCC) Plan
- Emergency Planning and Community Right-to-Know Act (EPCRA)
 - Planning for response or releases
 - Reporting of releases
- Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)
 - Integrated Pest Management & Restricted Use Pesticides (RUP's)
 - State certified applicators and operators
- Resource Conservation and Recovery Act (RCRA)
 - Solid and Hazardous Waste Management
 - Generator Status



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- Universal Waste Management – batteries, mercury containing thermostats, pesticides, lights and computer wastes
- Waste from Labs, Art, Physical Plant
- Used Oil (except PCB's and cooking oils)
- Underground Storage Tanks
- Waste Minimization
- Toxic Substances Control Act (TSCA) –
 - Asbestos Management Procedure

F. Sources of Additional Information

For additional information about the Harper College Environmental Management Plan or any other Environmental Health & Safety question contact the Manager of Environmental Health and Safety: Sara Gibson x6923 or sgibson@harpercollege.edu

Web pages:

EPA's Web site: <http://www.epa.gov>

Illinois EPA's Web site: <http://www.epa.state.il.us/>



15.2 CHEMICAL WASTE ID & DISPOSAL

A. Objective

To properly identify wastes and the proper disposal of wastes.

B. Scope

Waste disposal must be in compliance with *Harper's Environmental Management Plan (EMP)*, *Chemical Hygiene Plan (CHP)*, and all federal, state and local regulations.

C. References

Harper College *Environmental Management Plan (EMP)* and *Chemical Hygiene Plan (CHP)*. Applicable Federal, State and Local Law and Ordinances, e.g., OSHA, EPA, State Labor Codes.

D. General Information

- The U.S. Environmental Protection Agency regulates hazardous waste under the Resource Conservation and Recovery Act, commonly known as RCRA. Enacted in 1976 and modified in 1978, 1980, and 1984 (by the Hazardous and Solid Waste Amendments) RCRA established a "cradle-to-grave" system for managing hazardous wastes. This means that from the time a hazardous waste is created until it is finally destroyed, a paperwork trail makes sure someone is responsible for safeguarding it. The law also provides specific requirements for those who generate, transport, treat, store, or dispose of hazardous wastes. Training personnel in hazardous waste management and emergency procedures is required under RCRA.
- Other regulations such as the Clean Air Act and the Clean Water Act govern the disposal of waste into the air and the sewer system. Consult the Laboratory Chemical Hygiene Officer for identification, collection, storage and disposal of laboratory wastes. Consult the Manager of Environmental Health & Safety for storage, collection or disposal of chemical waste in other area of the College.

E. Waste Identification

- **Hazardous Waste** regulations require that hazardous waste be accurately identified. Common wastes include:
 - **Spent solvents, acids, bases and oxidizers** used in extractions, cleaning or other processes;
 - **Unused reagents and other chemicals** that are no longer needed, do not meet specifications, are contaminated, have exceeded their storage life or are otherwise unusable in the lab;
 - **Waste oils**; and
 - **Other miscellaneous materials**, including broken thermometers, heavy metal salts, pesticides, paints, etc.
- These wastes may be identified as either "**listed wastes**" (appear on lists of specific chemicals defined as hazardous waste issued by the EPA) or "**characteristic wastes**" (exhibit certain characteristics defined by the EPA including ignitability, corrosivity, reactivity and toxicity. The Laboratory Chemical Hygiene Officer is to determine hazardous waste identification in the laboratories.



F. Nonhazardous and Nonregulated Waste

- Waste that is not regulated by RCRA because it does not exhibit any of the hazardous characteristics (ignitability, corrosivity, reactivity, or toxicity) as defined by the EPA and is not listed as hazardous by the EPA should be segregated from hazardous waste. The common wastes usually not regulated as hazardous include:
 - **Certain salts** such as potassium chloride and sodium carbonate;
 - **Natural Products** such as sugars and amino acids;
 - **Inert materials** such as noncontaminated chromatography resins and gels.
- When safe and allowed by regulation, disposal of nonhazardous waste via the normal trash or sewer (down the drain of laboratory sinks) can substantially reduce disposal costs. This is the kind of waste segregation that makes economic as well as environmental sense. Always check with the Laboratory Chemical Hygiene Officer or the Manager of Environmental Health & Safety prior to disposing any chemical in the normal trash or down the drain in sinks.

G. Storage and Disposal of Hazardous Waste

- Regulations require that hazardous wastes be accumulated and stored in properly managed containers on sufficiently impervious surfaces (free of cracks, gaps, etc.). Hazardous waste may be stored in satellite accumulation areas. Once a satellite accumulation area container is filled, it must be dated and transferred to a main accumulation area. The Manager or Regulatory Compliance will coordinate storage, pick up and disposal by a professional waste hauler. **Disposal of hazardous wastes in sinks, in the normal trash or evaporation into the atmosphere is strictly prohibited by law.**

H. Storage and Disposal of Nonhazardous Waste

- The local municipality regulates the **disposal of nonhazardous waste in the normal trash**. Certain precautions should be observed when disposing of nonhazardous waste. Because custodians, who usually empty the trash containers, are not usually familiar with laboratory operations, no objects that could cause harm to them should be disposed of in those containers. Sharp metal and broken glassware, even though they may be considered nonhazardous trash, should be collected in specially marked containers. Empty chemical bottles should be rinsed and collected into a large cardboard box and clearly labeled "empty chemical bottles" and stored with normal trash for pick up.
- The Metropolitan Water Reclamation District regulates the **disposal of nonhazardous waste into the sewer system** (down the drain of laboratory sinks). Certain chemicals may be permissible for sewer disposal. These include aqueous solutions that readily biodegrade and low-toxicity solutions of inorganic substances. Water-immiscible chemicals and organic solvents should never go down the drain. Water-miscible flammable liquids are prohibited from disposal in the sewer system.

I. Labeling of Waste

- Containers that accumulate and store hazardous waste must be labeled with the following information:
 - The words "Hazardous Waste";
 - The waste type in words (spent non-halogenated solvents, waste oil, solid metal waste, etc.);
 - The date upon which the container became filled.



- All containers must be closed at all times, unless waste is being added or removed. Containers must be in good condition. There may not be severe rusting, dents or other conditions that could cause leaks. Organic waste jugs must have the flame arrestor in place and in good condition. Containers must be compatible with the hazardous waste stored within them. The use of peanut butter jars and plastic pop bottles is not acceptable. Containers should be inspected to ensure that they are properly labeled, in good condition and meet the criteria described above.

J. Waste Minimization

- Federal law requires generators of hazardous waste to implement measures to limit and reduce the volume and toxicity of hazardous waste. Waste minimization techniques include:
 - Process/equipment adjustment or modification;
 - Toxic material substitution;
 - Waste segregation, separation, concentration; and
 - Recycling.
- Where possible, microchemistry will reduce waste volume and has the added benefit of minimizing health and safety concerns.
- The exercise of prudence in ordering new chemicals will also ensure that excess chemical does not become subject to disposal as hazardous waste. Always check your inventory supplies, prior to purchasing any new chemicals. Only purchase the quantities that are needed. Furthermore, always obtain and review Material Safety Data Sheets for any new substances. MSDSs contain disposal instructions as well as toxicity information that you may want to consider before actually purchasing a new chemical.

K. Training

- Laboratory Instructors should be trained on the Chemical Hygiene Plan including Section 10- Waste Identification and Disposal, Appendix 12- Department of Chemistry Waste Management, Appendix 13- Department of Biology Waste Management and Appendix 9- Spill Clean-up Procedures. Training is conducted to Instructors by the Laboratory Chemical Hygiene Officer upon hire.
- Training on waste identification and disposal for other areas of the College, including but not limited to Art and Physical Plant, is given to the Supervisors of each area, by the Manager of Environmental Health & Safety (Sara Gibson x6923).

L. Sources for Additional Information

- Harper's Laboratory *Chemical Hygiene Plan* (CHP) Appendix 1 "Chemistry Department Waste Management SOP" describes the identification, collection, minimization techniques, and disposal procedures for waste accumulated in the Department of Chemistry.
- The Environmental Protection Agency (EPA) has excellent resource material to assist with waste minimization. You may access the EPA Home Page at the following address: <http://www.epa.gov>
- To address questions or concerns contact the Manager of Environmental Health & Safety or the Laboratory Chemical Hygiene Officer for additional information.



15.3 CHEMICAL SPILLS OR RELEASE

A. Objective

Specific information on Laboratory spills and releases (for Biology and Chemistry Laboratories) is maintained in *Section 8 – Laboratory Chemical Hygiene Plan of the EH&S Manual*.

All other spill or release procedures are covered in the *Environmental Management Plan (EMP)* maintained by the Manager of Environmental Health & Safety.

B. Scope

Any chemical spill or release on campus.

C. Procedure

Report ALL chemical spills/ releases immediately to Harper Police 6211.

Harper Police shall:

- 1. Isolate and control the area**
- 2. Call the Palatine Fire Department**
- 3. Notify the Manager, Environmental Health & Safety, if the Manager of EH&S is unavailable notify the Director of Physical Plant.**
- 4. If the spill is required to be cleaned up by an outside contractor, the Mgr. of EH&S or the Dir. of Physical Plant or the Supervisor of Harper Police should call SET Environmental in Wheeling, IL at 1-877-43SPILL or 1-877-437-7455.**



SECTION 16–ASBESTOS MANAGEMENT

16.1 Asbestos Management Procedure

16.2 Asbestos O&M Procedure

Reviewed: October 2008
Revised: February 2003
Date Accepted: April 2002
Draft Date: December 2001



16.1 ASBESTOS MANAGEMENT PROCEDURE

A. Objective

To ensure that asbestos exposures of all Harper College personnel, students, guests, visitors, and contract personnel are minimized by assuring that all activities that may impact, disturb or dislodge asbestos containing materials are managed and all building conditions that could allow exposure to asbestos fibers are abated, in a manner consistent with established safety practices.

B. Scope

This procedure is established to address the health concerns posed by exposure to asbestos in College owned buildings.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910.1001, Illinois Department of Labor 820 ILCS 225 Health and Safety Act., Illinois Department of Public Health, and IL Environmental Protection Agency (IEPA) 40 CFR Part 61.

D. Responsibilities

- Harper employees shall not perform any type of asbestos work that includes to disturb, dislodge, remove or repair any asbestos containing materials. All work of this type will be conducted under controlled conditions by asbestos abatement workers appropriately trained and licensed by the Illinois Department of Public Health.
- The Asbestos Program Manger (APM) is the Manager, Environmental Health & Safety (Mgr. EH&S). The Mgr. EH&S or a designated representative, will oversee and manage all work impacting Asbestos Containing Materials (ACM).
- The Manager, Environmental Health & Safety, or designated training representative, will provide training to inform, provide knowledge and basic awareness to Harper College employees on asbestos issues.

E. General Information

Asbestos is a common, naturally occurring group of fibrous minerals. It was widely used in building materials prior to 1980 because it is heat resistant, strong and not easily degraded. Common products that contain asbestos include, but are not limited to: pipe insulation, tank insulation, floor tile and fireproofing. These material are classified as “friable”, which is material that can be reduced to powder by hand, and “nonfriable”, which is material that cannot be reduced to powder by hand. Materials such as these in buildings built prior to 1980 shall be Presumed Asbestos Containing Material (PACM), until tested and proven otherwise.

Asbestos is a concern when fibers become airborne such as when Asbestos Containing Materials (ACM) are crumbled or reduced to powder. Intact, sealed, and undisturbed materials do not present an opportunity for exposure. When asbestos fibers become airborne, exposure may occur by the fibers being inhaled and deposited into the lungs. Studies have shown that some individuals exposed to certain amounts of asbestos have developed lung cancer, asbestosis (scarring of the lungs), and mesothelioma (cancer of the lining of the lung or abdomen). These diseases have generally been observed after



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long-term exposures from activities that directly disturb asbestos containing materials. Typically, the diseases do not develop until 10 to 40 years after exposure.

F. Procedure

In the campus buildings built before 1980 all building materials will be Presumed Asbestos Containing Materials (PACM), unless tested to prove otherwise. The Manager of Environmental Health & Safety has an Asbestos Inventory of locations that have been sample to determine if asbestos is present. *Most* of the samples have identified asbestos in the floor tile, floor tile mastic and pipe joint compound.

Campus buildings that were built before 1980 include the following:

- A Building (1969) –Student Administration Center (& K wing addition)
- B Building (1969) – Harper Police Center
- C Building (1969) –New Student Services and Art Center
- D Building (1969) Science, Math and Health Careers Center
- E Building (1969) – Instructional Delivery Center
- F Building (1969) –Academic Resources Center
- G/H Buildings (1977) – Engineering and Applied Technology Center
- I/J Buildings (1980) –Business and Social Science Center
- M Building (1980) – Wellness and Sports Center
- P Building (1974) – Music Instruction Center
- T Building (1973) –Park Management Shop
- U Building (1974) – Roads and Grounds Shop
- V Building (1975) – Plant Science Center
- Northeast Center (1973)

The College adheres to the Environmental Protection Agency’s (EPA) recommendation to manage asbestos in place. This strategy involves maintaining existing ACM in good condition, and removing it only during demolition, renovation or maintenance activities.

Prior to the start of any renovation or demolition project, the Manager, EH&S., must determine if any PACM may be disturbed during the project. If there is any PACM identified in the project areas that may be impacted or disturbed, it must be tested to determine its asbestos content following established protocols or assume the material contains asbestos and is managed as ACM.

PACM that have the possibility of containing asbestos and should be sampled before being disturbed include, but are not limited to the following:

- | | | |
|-----------------|--|---------------------|
| Floor Tile | Floor tile mastic | Ceiling Tile |
| Wall Plaster | Pipe Insulation | Pipe Joint Compound |
| Lab Hoods | Lab Tops | Ceiling Plaster |
| Duct Insulation | Cementitious Ridged Panels (Transite Panels) | |

Examples of activities which may result in the disturbance of PACM include:

- Removing or repairing floor tile, by breaking tiles;
- Removing pipe insulation or pipe joint compound to access pipes and/or;
- Carpet removal, which has floor tile underneath it.

If these activities, renovation and/or demolition disturb PACM, then further investigation by a consultant shall be done in which, the consultant will take samples of the suspect ACM for laboratory analysis to determine the asbestos content of the material. If the laboratory analysis shows that the PACM is greater than 1% asbestos containing then



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the material must be handled as asbestos. A licensed asbestos contractor must be called to abate the ACM prior to any activities, renovation and/or demolition.

Building occupants shall be notified prior to the abatement activities. The notification occurs through correspondence and/or signage at the job site. The information shall include the type of asbestos (i.e.; floor tile), amount of asbestos, and the location. Occupants should contact the Mgr. EH&S (x6923) and/or Physical Plant (x6350) if there are any questions.



16.2 ASBESTOS O&M PROCEDURE

A. Objective

To outline Operations & Maintenance (O&M) work practices to (1) maintain ACM in good condition, (2) ensure proper cleanup of asbestos fibers that may have released by accidental disturbance and (3) to monitor the condition of ACM.

B. Scope

In areas of the College where PACM has been tested and has been identified as asbestos containing (*mostly floor tile, floor tile mastic and pipe joint compounds*) the following procedures shall be implemented.

C. Procedure

1) Maintain ACM in good condition: Work practices should discourage disturbing Asbestos Containing Materials (ACM). This includes avoiding the action of drilling, cutting, abrading, sanding, chipping, breaking, or sawing ACM. These actions are likely to create asbestos fiber release. Certain other activities that occur in the vicinity of ACM can also cause damage, which may result in asbestos fiber release. For example, maintenance and custodial staff may damage ACM accidentally with broom handles, ladders, and forklifts while performing other tasks. Activities performed in the vicinity of ACM should always be performed cautiously to prevent fiber release.

2) Notify the Asbestos Program Manger (APM)/ Mgr. Environmental Health & Safety (Mgr. EH&S) if there has been an accidental release. The Mgr. EH&S will conduct or oversee the proper O&M cleaning will involve the use of wet cleaning or wet-wiping practices to pick up asbestos fibers. Dry sweeping or dusting can result in asbestos fibers being re-suspended into the building's air and therefore should not be used. Once wet clothes, rags, or mops have been used to pick up asbestos fibers, they should be properly discarded as asbestos waste while still wet. They should not be allowed to dry out, since the collected fibers might be released at some later time when disturbed.

3) The Mgr. EH&S will Monitor the condition of ACM. The condition of ACM shall be monitored to ensure that any ACM damage or deterioration will be detected and corrective action taken.

D. Training

Awareness training shall be conducted for custodians, maintenance and utilities personnel involved in cleaning and simple maintenance tasks where ACM may be accidentally disturbed. The APM/Manager EH&S or a designated training representative will conduct training.

Awareness training shall include the following topics:

- Background information on asbestos;
- Health effects of asbestos;
- Worker protection programs;



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- Locations of ACM and PACM in the buildings;
- Recognition of PACM damage and deterioration;
- The Harper College Asbestos O&M Program; and
- Proper response to accidental fiber release episodes.



SECTION 17–FLEET SAFETY

17.1 Fleet Safety Guidelines

17.2 Accident Reporting

17.3 Vehicle Use Acknowledgement Form

17.4 Pre- Trip Checklist & Guidelines

Reviewed: October 2008
Revised: February 2003
Date: April 2002



17.1 FLEET SAFETY GUIDELINES

A. Introduction

The purpose of these fleet safety guidelines is to define standards of conduct and establish requirements for faculty, staff, students and volunteers who operate motor vehicles while conducting Harper College business. The primary goals of the guidelines are to help prevent accidents and minimize the risk of personal injury associated with those incidents.

The procedure to reserve and obtain a College vehicle can be found in the *Administrative Services Procedure Manual* in the Physical Plant Division Section.

B. Scope

The Fleet Safety Program applies to all College owned, leased and rented vehicles and all offices and departments that have responsibility for these vehicles. **ALL** individuals driving (this includes the driver checking out the vehicle, and **ANY** driver that may drive at **ANY** time the vehicle is in use) College vehicles must be qualified under this program.

C. Driver Qualification

- All Harper College motor vehicle operators must be in possession of a valid driver's license from their state of residence. The license must be compatible with the type(s) of vehicle(s) to be driven.
- The driver must agree to a review of their driving history by checking the Motor Vehicle Record (MVR) from the state in which the candidate holds their driver's license. The MVR details the accident and traffic violation history of the candidate over the last three years. In order to drive the candidate's MVR must be free of any two moving violations in the past year, or one moving violation and one accident, or two accidents, or any single alcohol and/or drug related stops.

D. Qualification Procedure

- At the beginning of each year, department Administrators must submit a signed "Vehicle Use Acknowledgement Form" to Harper Police from all employees that drive College vehicles as part of their job.
- All other faculty, staff, student and/or volunteer who request the use of a College vehicle for a specific event or trip, must submit a signed "Vehicle Use Acknowledgement Form" to Harper Police one week before using the vehicle. Harper Police must receive a signed "Vehicle Use Acknowledgement Form" for ALL individuals that will drive or may drive the vehicle anytime during the event or trip. The "Vehicle Use Acknowledgement Form" is good for only one event or trip.

E. Driver responsibilities

Drivers must:

1. All drivers must be authorized by the above procedure to operate a College vehicle.
2. Drivers shall be alcohol and drug free.
3. Drivers must not drive when driving conditions are hazardous (this includes but is not limited to fog, heavy rain, snow or ice conditions). Windows and mirrors must be clear (this includes but is not limited to frost/snow and/or luggage/equipment obstructions).



4. Drivers are required to conduct a pre-trip inspection prior to the operation of the vehicle. Deficiencies or any mechanical defect that would jeopardize the safe operation of the vehicle (such as leaking gas line or overheating engine) must be corrected immediately. Vehicles found to be in unsafe condition are not to be operated until repairs are made. (See section 17.4 Pre-Trip Inspection Checklist)
5. Drivers must observe all traffic regulations. Drivers are personally responsible for any traffic citations (tickets) that may be issued as a result of operating a College vehicle.
6. Drivers must only transport the number of persons for which there are seatbelts in the vehicle. All persons must wear their seatbelts.
7. Drivers are responsible to ensure that the vehicle is used only for College business. Drivers shall not pick up or transport family members, hitchhikers, friends, or any other person not on official College business.
8. Drivers are responsible for the security and safety of the vehicle until it is returned to the designated location at the College.

F. Accident Reporting / Investigation

Drivers must report all accidents, regardless of damage. Accidents that occur on College property must be reported immediately to Harper Police (847-925-6211). Accidents that occur off Harper property must be reported immediately to the appropriate law enforcement agency and to Harper Police (987-925-6211) as soon as practical. See Section 17.2 Accident Reporting for what to do in case of an accident and how to report an accident that occurs off campus.

G. Pre-Trip Inspection

- A pre-trip vehicle inspection shall be completed before using the vehicle. Check the following for proper operations: lights, turn signal, horn, breaks, windshield wipers and tires. (See Section 17.4 –Pre-Trip Inspection Checklist)
- Report any mechanical problems to Physical Plant.

H. Transportation of Children in Grades K-12 (i.e.; In-Zone)

Drivers must be of 21 years of age and have at least one year of driving experience.

I. Restricted use of Passenger Vans

Passenger vans with seating for over ten (10) occupants shall not be operated or used in the following states: Connecticut, the District of Columbia, Florida, Iowa, Maine, Massachusetts, or New York. This applies to rented vans using Harper auto insurance.

J. Use of Personal Vehicles

Faculty and staff shall use their personal vehicles for Harper College related business at their own discretion. However, most personal automobile insurance policies will generally not cover individuals conducting work related business, unless there is an extra rider purchased for this purpose.

Harper College automobile insurance is applicable to only Harper College vehicles. To ensure everyone is covered by Harper College automobile insurance, it is strongly recommended that all trips be in Harper College vehicles or rental vehicles with appropriate insurance coverage. When renting vehicles check with Purchasing Department to ensure appropriate insurance coverage has been obtained.



17.2 ACCIDENT REPORTING

A. At The Scene of An Accident

To minimize the results of an accident, the driver must prevent further damages or injuries and obtain all pertinent information and report it accurately.

Refer to the Vehicle Accident packet to provide a record of information at the scene.

This packet should contain:

- Driver's Report of Motor Vehicle Accident Form
- Traffic Accident Exchange Information Form
- Insurance Card

B. What You Should Do After An Accident

- **Take Immediate Action To Prevent Further Damage Or Injury At The Scene Of The Accident**

- Pull onto shoulder or side of road.
- Actuate four-way flashers and place warning signals promptly and properly.
- Assist any injured person, but don't move them unless they are in danger of further injury.

- **Call the Police (OFF Harper Campus call 911 to notify the appropriate law enforcement/ emergency agency, ON campus call Harper Police 6211.)**

- If someone is injured, request medical assistance.
- If the driver cannot get to a nearby phone, he/she should write a note giving location and seriousness of the accident and give it to a reliable-appearing motorist and ask him/her to notify police.
- The vehicle should not be left unattended except in extreme emergency.

C. Exchange "Traffic Accident Exchange Information" Forms with Other Driver(s)

- The driver should give identifying information to the other party involved, but should make **no** comments about assuming responsibility.



D. Complete the "Driver's Report of Motor Vehicle Accident" Form if the accident occurred off campus. On campus Harper Police will report accidents.

- Drivers should remember the following general rules for filling in the report:
 - Print or write legibly.
 - Follow instructions to the letter.
 - Answer all questions completely. If unable to answer any question, mark "not known".
 - Use additional sheets of paper if space is lacking for necessary information.

E. Report the Accident

- The driver should call to inform Harper Police (847-925-6211) as soon as practical.
- If the vehicle is inoperable due to the accident contact Harper Police (847-925-6211). Harper Police will arrange with the local Police to have the vehicle towed and will arrange for alternate transportation for the group.



17.3 VEHICLE USE ACKNOWLEDGEMENT FORM

ALL individuals driving (this includes the driver checking out the vehicle, and ANY driver that may drive at ANY time the vehicle is in use) College vehicles must sign this form. Use additional copies if there are more than four drivers.

A. Safe Driving Requirement

I acknowledge that I must operate any vehicle used on Harper College business in a safe, responsible manner and in compliance with the law. I will use vehicles on College business only as authorized by my Dean or Director. I have read and agree to follow the fleet safety guidelines as outlined in the "Environmental Health & Safety Procedure Manual".

B. Physical Condition

I have no physical or mental condition that may impair my ability to drive. If my condition changes such that my ability to drive may be impaired, I shall notify my Dean or Director immediately.

C. Motor Vehicle License

I am licensed to drive. I have attached a photocopy of my license to this form. I will promptly notify my Dean or Director if a police authority impounds my license, suspended, revoked or expires. I authorize the College to obtain a copy of my official state motor vehicle record (MVR) including the current status of my license and any traffic convictions. I further authorize the College to make this information available to the College's insurance company. I further authorize the College to obtain updates of this information during my employment or status as a driver.

D. Accidents and Traffic Citations

I shall report any accident involving a vehicle I am operating on College business immediately to Harper Police at (847-925-6211) for on or off campus accidents and to the appropriate law enforcement agency for off campus accidents. I will also notify my Dean or Director as soon as possible. I will complete all state, College and insurance accident forms promptly, accurately and completely. I will report any traffic citation or parking ticket I receive while using a College vehicle to my Dean or Director as soon as practical. I understand that I am personally responsible for any traffic or parking fines that I may incur while driving a College vehicle.

E. College Insurance

I have been informed that any authorized driver of a College vehicle is covered by College insurance, but that it will not cover a driver who intentionally caused injury or damage.

Department/ Club: _____ Destination: _____ Trip Date: _____

I am 18 years of age or older and have read and fully understand the provisions of the Fleet Safety Policy.

1. _____	_____	_____
Print Driver's Full Name	Driver's Signature	Date
Applicant is qualified to drive:	<input type="checkbox"/> YES <input type="checkbox"/> NO	Date of MVR check: _____
2. _____	_____	_____
Print Driver's Full Name	Driver's Signature	Date
Applicant is qualified to drive:	<input type="checkbox"/> YES <input type="checkbox"/> NO	Date of MVR check: _____
3. _____	_____	_____
Print Driver's Full Name	Driver's Signature	Date
Applicant is qualified to drive:	<input type="checkbox"/> YES <input type="checkbox"/> NO	Date of MVR check: _____
4. _____	_____	_____
Print Driver's Full Name	Driver's Signature	Date
Applicant is qualified to drive:	<input type="checkbox"/> YES <input type="checkbox"/> NO	Date of MVR check: _____

Bring a copy of this form to Physical Plant when picking up the keys.



17.4 PRE-TRIP CHECKLIST

Pre- Trip Checklist & Guidelines

Check all of the following for proper operation before taking a vehicle off campus:

	O.K.	Needs Attention		O.K.	Needs Attention
1. Adjust All Mirrors			6. Windshield wipers		
2. Turn signal			7. Seat belts		
3. Lights			8. Horn		
4. No windows obstructed/or covered.			9. Secure luggage/equipment		
5. Emergency information and insurance information			10. No fluids leaking from vehicle.		

Other problems:

The following Guidelines **MUST** be followed while operating Harper vehicles:

- | | |
|--|---|
| 1. Driver must have valid drivers license. | 6. Vehicle is to be used for College business only. |
| 2. Driver must obey all traffic regulations. | 7. The vehicle must be returned with a clean interior. |
| 3. Driver and passengers must wear seatbelts. | |
| 4. Driver shall be alcohol and drug free. | |
| 5. Drivers are responsible for safety and security of the vehicle. | |

Completed by: _____

Date: _____



SECTION 18–ASSEMBLY & THEATER **SAFETY**

(Assembly occupancy is defined by NFPA 101, 2000 as any occupancy used for a gathering of 50 or more persons for deliberation, worship, entertainment, eating, drinking, amusement, awaiting transportation, or similar uses; or used as a special amusement building, regardless of occupant load.)

18.1 Assembly Guidelines

18.2 Theater Safety Guidelines

Reviewed: October 2008

Revised: March 2003

Date Accepted: April 2002

Draft Date: December 2001

18.1 ASSEMBLY GUIDELINES

A. Objective

To provide safety rules and procedures to follow for assembly events (gathering of 50 or more people).

B. Scope

This procedure covers all assembly areas at Harper College where there is a gathering over 50 people, including but not limited to: Performing Arts Center, J143, Wojcik Conference Center, M building Gym, and lecture halls.

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act., National Fire Protection Association (NFPA) Life Safety Code 101, 2000.

D. Training

The Facilities Manager; the Manager, Environmental Health & Safety and/or a designated training representative shall conduct training on this procedure and other procedures referred to in this manual.

E. Ticket Sales

Attendance for an event can be controlled through ticket sales, so overcrowding does not become an issue. Standing room shall not be permitted. The number of fixed seats in a space is the maximum occupancy. For seating arrangements with mobile seating, the arrangement and number of seats shall comply with the NFPA Life Safety Code 101, 2000. The Manager, Environmental Health & Safety can assist with interpretation of the Code.

The Facility Administrator and/or Harper Police determine the need for security measures. The number of people involved and the nature of the event are the primary determining factors. In some cases, security may be required for the use of certain buildings or areas.

F. Crowd Control/Front-of-House Responsibilities

For the fixed seating occupancies over 300 (J143 & PAC), the house/facility manager and all front-of-house personnel must assist the audience to evacuate the building safely in case of an emergency. A fire safety and evacuation plan must be prepared and personnel should be trained and drilled in the duties they are to perform under the plan. In addition, front-of-house personnel must be knowledgeable in the proper use of portable fire extinguishers.

In assembly occupancies of 1000 or more (M bldg Gym), there shall be trained crowd managers at a ratio of 1 crowd manager for every 250 occupants (unless reduced by the Palatine Fire Dept.) due to the nature of the event or existence of sprinklers. These crowd managers shall receive training in crowd management techniques.

G. Exits (Means of Egress)

The means of egress is the continuous and unobstructed path of travel from any point in a place of assembly to an exit or public way (e.g., sidewalk, street, etc.). All parts of the means of egress must be available for immediate, emergency use.

- Aisles and corridors must be unobstructed and kept free of flammable or combustible materials. Event organizers must inspect the means of egress immediately prior to any event and remove any obstructions immediately.
- Exit doors must be unlocked.
- Care must be taken to ensure that the exit discharge is also unobstructed (e.g., not blocked by dumpsters or vehicles, no materials stored against the exit door, all snow removed, etc.).
- All exit signs must be clearly illuminated and unobstructed at all times.
- The width of a means of egress cannot be blocked or reduced.
- Draperies or similar decorative hangings cannot obstruct the view or the access to an exit.
- Mirrors cannot be placed near an exit in any manner that may confuse those trying to exit.

Exits cannot be used for any other purpose other than a means of egress. Spaces within a stairway enclosure are not to be used for storage of any materials.

H. Flame-Retardant/ Open Flame/ Pyrotechnics

The use of open flame devices (including but not limited to candles) or pyrotechnic devices must be approved by the Palatine Fire Department.

Combustible scenery of cloth, film or vegetation (dry) and similar materials shall meet the requirements of NFPA 701. Foamed plastics shall be permitted to be used only by specific approval of the Palatine Fire Department.

Procedures for Food Service Operations:

Portable cooking equipment that is not flue-connected shall be permitted only as follows:

1. Equipment fueled by small heat sources that can be readily extinguished by water, such as candles or alcohol-burning equipment, including solid alcohol, shall be permitted to be used, provided that precautions that are taken to prevent ignition of any combustible materials satisfy the Palatine Fire Dept.
2. Candles shall be permitted to be used on tables used for food service where securely supported on substantial noncombustible bases located to avoid danger of ignition of combustible materials and only where approved by the Palatine Fire Dept.
3. Candle flames shall be protected.
4. "Flaming sword" or other equipment involving open flames and flamed dishes, such as cherries jubilee or crepe suzette, shall be permitted to be used, provided that precautions subject to the Palatine Fire Dept. are taken.
5. Listed and approved LP-gas commercial food service appliances shall be permitted to be used where in accordance with NFPA 58.

I. Exhibits

Exhibit booths shall be constructed of the following:

1. Noncombustible or limited-combustible materials
2. Wood exceeding ¼ inch (0.6 cm) nominal thickness or wood not exceeding ¼ inch (0.6 cm) nominal thickness that is pressure-treated, fire retardant wood meeting the requirements of NFPA 703.

18.2 THEATER GUIDELINES

A. Objective

To provide safety rules and procedures to follow while working on productions from the planning stages to strike.

B. Scope

It is applicable to all members of the college community including, but not limited to directors, performers, crew, stage managers, and front-of-house personnel. Any questions or comments regarding this manual should be directed to the Manager of Environmental Health & Safety in Physical Plant.

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act.
National Fire Protection Association (NFPA) Life Safety Code 101, 2000.

D. Training

The Theater Manager, Technical Director, the Manager of Environmental Health & Safety or a designated training representative shall conduct training on this procedure and other procedures referred to in this manual.

E. Procedure

- A pre-production meeting shall be conducted. This meeting will cover set design, type of production, review any requests for the use of special effects or pyrotechnics and review of this Section 18-Assembly & Theater Safety of the Environmental Health & Safety Procedure Manual (EH&S Manual).
- All Incidents shall be reported to the Theater Manager or Technical Director. See *Section 5- Incident/ Injury Management* of the EH&S Manual.
 - Life-threatening injuries (examples are severe burns, hemorrhaging, severe head injury, open (compound) fracture).
 - **Call Harper Police at 6211**
 - Notify the Theater Manager or Technical Director
 - Other Injuries (Non-life threatening)
 - Notify the Theater Manager or Technical Director
 - Notify Harper Police at 6211 and proceed to Health and Psychological Services.
 - The Theater Manager or Technical Director shall complete a Supervisor's Incident/Injury Report. This report should be copied to Health and Psychological Services and the Manager of Environmental Health & Safety for both injured employees and students. For employee injuries also copy Human Resources.

SET DESIGN & CONSTRUCTION

A. Props and Decoration

All requirements of Section 18.1 Assembly Guidelines shall be followed. In addition, wood and decorative materials may be used only if they are noncombustible or flame resistant or have been rendered so with commercially available products and meet requirements of NFPA 701. The quantity and arrangement shall be reviewed by the Manager of Environmental Health & Safety. The use of open flame devices and/or pyrotechnics must be approved by the Palatine Fire Department. Use of smoke machines, strobes, and/or gunshot sounds should be approved by the Technical Director and a notice included in the program. Contact the Technical Director or the Manager of Environmental Health & Safety or if you have any questions about the approved use of decorative materials.

B. Structural Issues for Set Design

The Technical Director must approve any set design that includes steps, ladders, traps or other specialty devices.

C. Rigging

All theaters that have fly space where rigging is used. Some rigging guidelines include:

- Anything attached to a flybar must have a safety cable attached as well.
- Check that everything attached to a light, including barn doors, gel cases and safety cables, is secure before it is raised.
- Make sure the rope or cord is strong enough for what you are lifting and that the rope or cord is not frayed or damaged in any way.
- Warn people on the stage or grid before moving any rigged scenery or other objects.
- Maintain visual contact with a moving piece at all times.

The Technical Director performs inspections of rigging and overhead lighting prior to the opening of each show. The production crew before each use should also inspect rigging.

D. Personal Protective Equipment (PPE)

Personal protective equipment includes all types of equipment used to increase individual safety while performing potentially hazardous tasks. This may include eye and face protection, head protection, foot protection, hand protection, respiratory protection, or any equipment used to protect against injury or illness. The Manager of Environmental Health & Safety can help in assessing the need and making selections of personal protective equipment.

- **Safety Glasses:** Safety glasses look very much like normal glasses but are designed and manufactured to certain standards to protect against flying particles. Safety glasses have lenses that are impact resistant and frames that are far stronger than regular street wear. Safety glasses must have side shields and should be worn whenever there is the possibility of flying particles, dust, wood chips, or paint to enter the eye. Always wear safety glasses when using any power tool.
- **Goggles:** Like standard safety glasses, goggles are impact resistant. Goggles provide a secure shield around the entire eye area to protect against hazards coming from many directions. Safety goggles may have regular or indirect ventilation.



(Goggles with indirect ventilation may be required if you are exposed to splash hazards, e.g., solvents, paints or thinners).

- **Gloves:** Gloves are often relied upon to prevent cuts, abrasions, burns, and skin contact with chemicals. It is important to select the most appropriate glove for a particular application and to determine how long it can be worn, and whether it can be reused. Nitrile gloves should be worn when handling large amounts of solvents or paint thinners. Leather work gloves may be used in material handling and when using power tools to avoid severe cuts, lacerations, and abrasions.
- **Shoes:** Shoes should have a hard sole when working around sharp objects such as nails, wire, tacks, screws and large staples could be stepped on causing a foot injury. Open-toed shoes should not be worn during any phase of set construction.

For more information on personal protective equipment, see *Section 6* of the *Environmental Health & Safety Procedure Manual (EH&S Manual)*.

E. Power and Hand Tools

Crewmembers should use a power tool only after receiving proper training. The Head of Set Construction or Technical Director should review the operation of the equipment, making sure to point out safety features and guards. Crewmembers should be familiar with the owner's manual for the tool, and should know both the use and the limitations of a power tool.

Some guidelines for using tools include:

- Inspect tools before use to check for any defects such as frayed wires, or damaged hand tools.
- Remove defective tools from service and have repaired or replaced.
- Only use power tools that are grounded with a 3-pronged plug or that are double insulated.
- Never carry a power tool by its cord.
- Unplug power tools before loading them, changing blades or bits, making adjustments, or cleaning them – and follow the manufacturer's instructions.
- Never use power tools on wet surfaces or in wet weather.
- Discontinue use of defective or unsafe equipment as soon as the defect becomes known.
- Dull tools are unsafe and can damage work. Maintain your tools and always use sharp cutting blades.
- Never alter or remove any machine or blade guards.
- Report all incidents to the Head of Set Construction or the Technical Director.

F. Ladders

Portable ladders should be inspected at frequent, regular intervals and maintained in good condition free from oil, grease, or other slippery materials. Defective ladders should be removed from service until repaired. Those that cannot be repaired should be destroyed.

Ladders should always be placed on stable bases and, whenever possible should be secured near the top and at the bottom. Boxes, barrels, or other unstable surfaces should never be used to extend the reach of a ladder.

See *Section 19- Portable Ladder Safety* of the *Environmental Health & Safety Procedure Manual* for all College ladder users. It includes a ladder inspection checklist, which is helpful before each ladder use.

G. Chemical Hazards - Hazard Communication

The key to safe chemical usage is to be aware of information on the physical and health hazards of chemicals, safe handling precautions, and emergency and first aid procedures.

Each chemical container bears a manufacturer label with the chemical name(s), hazard warnings, and the manufacturer's name and address. Labels must not be removed or defaced. If the product is transferred from one container to another, the new container must be labeled with the product name, the names of all hazardous chemicals and/or the five most predominant chemical constituents, the Chemical Abstract Service (CAS) number for each chemical, and appropriate hazard warnings.

Each group must obtain and maintain a Material Safety Data Sheet (MSDS) for each hazardous material used. See *Section 7 – Hazard Communication* of the *EH&S Manual* for more information on interpretation of MSDS information. These MSDSs must be accessible to individuals working with the products during all work hours. If an MSDS is not received with a product, the group must obtain the MSDS within a reasonable amount of time.

Vapors from flammable liquids ignite readily when mixed in certain proportions with air in the presence of an ignition source and could result in an explosion. Flammable and combustible liquids vaporize and form flammable mixtures with air when in open containers, when leaks occur, or when heated.

Use nonflammable materials like water base paint whenever possible. Water-base or latex paints are less hazardous and allow for easier clean up and disposal than oil-based paints. Buy as you need it -- quantities should be limited to the amount necessary for the work in progress. Control all ignition sources in areas where flammable liquids are used. No smoking or open flames should be present during the use of flammable liquids. Spray paint cans are under extreme pressure and could rupture when exposed to fire. Never puncture aerosol cans or expose them to high heat or other stresses. Read and follow the manufacturer's label and precautions on aerosol cans. Paints and thinners should not be mixed with general trash or poured down the drain. Contact the Manager of Regulatory Compliance if you have flammable liquids to be disposed.

Please refer to *Section 7 –Hazard Communication Program* of *EH&S Manual* for more information.

H. Chemical Spills

In the event of a chemical spill, the individual(s) who caused the spill is responsible for prompt and proper clean up.

Harper College does not have a spill response team. Improper clean up of a spill may result in injury, illness, fire, a release to the environment, or property damage.

Contact Harper Police at 6211 if:

- There is a fire or medical attention is needed
- The quantity of material spilled is more than one gallon



- You are uncomfortable in your ability to clean up the spill
- There is a release to the environment (i.e., soil, waterways, sewer, etc.)

Planning for spills is essential. Before beginning work with chemicals, be sure that the appropriate types and amounts of spill clean-up materials and personal protective equipment are immediately available.

Review Material Safety Data Sheets or other references for recommended spill clean-up methods and materials, and the need for personal protective equipment (e.g., gloves, aprons, etc.)

General guidelines for cleaning up spills:

- Immediately alert others in the area, and evacuate the area, if necessary
- Contaminated clothing must be removed immediately and the skin flushed with water for no less than fifteen minutes. Clothing must be laundered before reuse
- If a volatile, flammable material is spilled, immediately warn others in the area, control sources of ignition and ventilate the area

I. Housekeeping

Work areas can become congested while set building and rehearsals take place. Clutter makes it difficult to move around and can be a fire hazard. To prevent accumulation of materials, trash should be removed daily.

- Place trash in proper receptacles, preferable in metal containers.
- Clean up after each work session
- Avoid accumulating scrap lumber and materials
- Purchase materials as needed to avoid the need for additional storage
- Store tools in the proper areas when not in use

Housekeeping is the sole responsibility of the people working with the production. This includes the dressing rooms, scene shop, and audience seating areas. Physical Plant maintains other venues, although students are still responsible for keeping areas clean and clear of congestion.

J. Storage of Materials

The proper storage of materials in theater spaces is extremely important to the efficiency of the production and the safety of the cast, crew and audience. The National Fire Protection Code mandates certain storage requirements, such as:

- Flammable and combustible liquids must be stored in approved flammable storage cabinets.
- If the building has sprinklers, materials must be a minimum of 18 inches below sprinkler head. Materials in any building must be a minimum of 24 inches below the ceiling
- Materials must never obstruct an exit from the building
- Stored materials must be a minimum of three feet in all directions from unit heaters, duct furnaces and flues
- Smoking is prohibited in all places of assembly and in spaces where combustible materials are stored or handled
- Materials may not be stored under seating risers or steps

K. Lifting and Material Handling

Back pain and injuries related to lifting and material handling are some of the most frequent types of injuries. While some factors that contribute to the potential for injury cannot be controlled, others can be reduced or minimized. Stage pieces are often awkward, heavy, or unusually shaped, which impedes proper lifting techniques.

Some general lifting techniques include:

- Perform stretching exercises and warm-ups prior to lifting – Warming up your back muscles can help reduce the stress of an initial lift.
- Use the right personal protective equipment – Some work gloves offer non-slip grips to handle a load easier.
- Wear non-slip shoes to avoid a fall while carrying a load.
- Take time to size up the load – Is it too large or heavy for one person to lift? Will you be able to get through doorways and corridors as you are carrying it? Can it be broken down into several trips?
- Plan your route ahead of time – Make sure there is a clear path to avoid tripping hazards. Be able to see where you are going and avoid sharp turns or difficult courses.

Proper lifting techniques

1. Stand close to the load – Carrying an object as close to your body as possible will keep the strain on your back at a minimum and will also help keep your center of gravity over your feet to maintain balance.
2. Bend your knees – Your leg muscles are much more equipped to handle heavy loads than your back muscles. Bending your knees will allow you to lift with your legs and reduce the load on your lower back.
3. Grip the load securely – Get a secure handle on the object before you lift to avoid slipping. If a load does start to fall away from you, let it go. You can do enormous damage to your back if you attempt to catch a heavy object in an awkward position.
4. Lower the load in reverse – All the effort put into a proper lift will be erased if the load is lowered by bending at the waist and putting pressure on the back.

Back belts provide no protection from back injuries. Harper does not recommend the use of back belts for such purposes.

LIGHTING & SOUND

A. Electrical Safety

Electricity is intrinsic in modern life. However, many students have never worked with electricity directly before working on stage. To work near electricity safely, it is necessary to understand what hazards it presents, and how these hazards can be controlled.

How Shocks Occur

Electric shock occurs when the body becomes a part of an electric circuit. The current enters the body at one point and leaves at another. Electric shock normally occurs in one of three ways - individuals, while in contact with the ground, come in contact with:

1. Both wires of the electric circuit
2. One wire of an energized circuit and the ground
3. A metallic part that has become "hot" by contact with an energized conductor.

The metal parts of electric tools may become energized if there is a break in the insulation of the tool or machine wiring. A ground wire will cause the unwanted current to pass directly to the ground, thereby greatly reducing the amount of current passing through the body of the person in contact with the tool.

Severity of Shocks

The severity of the shock received when a person becomes a part of an electric circuit depends on three primary factors:

- the amount of current flowing through the body (measured in amperes), the path of the current through the body, and
- the length of time the body is in the circuit.

Effects can range from a barely perceptible tingle to immediate cardiac arrest, depending upon the type of circuit, its voltage, resistance, current, etc. A severe shock can cause considerably more damage to the body than is visible. For example, a person may suffer internal hemorrhages and destruction of tissues, nerves, and muscles. In addition, shock is often only the beginning in a chain of events. The final injury may well be from a fall, cuts, burns, or broken bones.

Preventing Electrical Hazards

Repairs: Students should not attempt electrical repairs without proper training.

Equipment that malfunctions or causes shocks should be removed from service and repaired by a qualified individual.

Extension Cords: Extension cords are only designed for temporary use. Use of thin, light duty extension cords can increase the risk of fire and shock. Make sure extension cords have adequate current capacity for the equipment being used. Do not pull an electrical cord out of a socket by the cord. This breaks interior wires and can cause a short and, possibly, a fire. Inspect for frayed or split cords or plugs before use.

Electrical Cords: Electrical cords can also be a tripping hazard. It is a good practice to route cords away from traffic areas to prevent trips and falls.

Avoid stretching or pinching cords between objects. This can break interior wires, causing overheating which can result in a fire. Do not cover electrical cords with rugs or run under or through door hinges; this can also result in a fire.



Circuit Protection Devices: Circuit protection devices are designed to automatically limit or shut off the flow of electricity in the event of a ground-fault, overload, or short circuit in the wiring system. A ground-fault circuit interrupter, or GFCI, should be used in high risk areas such as wet locations or outdoor sites. Portable GFCIs are available from any hardware store or safety supply catalog.

Training: Training is essential in working with lighting circuitry, dimmers and instruments. Students should be trained before being authorized to work the control areas. Keep food and beverages out of the light control areas to prevent possible shocks and damage to the circuitry.

B. Overhead Lighting

Lighting dimmers have limits to the lamp loads they can handle. Overloading dimmers can cause a fire hazard. There are standard size 2.4-kilowatt (2400W maximum) dimmers used in the theater spaces. The spaces also use standard lamps listed as follows:

Fresnels: BTL 500W
BTR 250W

Ellipsoidals: FEL 1000W
EHD 500W
EHG 750W

Source 4: HPL 575W

The wattage of the bulbs MAY NOT exceed that of the dimmers they are plugged into.

All lighting that is hung over seating or public area shall be secured with chains.

CAST & CREW

A. Cosmetics

Products approved for makeup use have been tested extensively for toxic hazards. Only these products should be used for stage productions. Old containers of makeup could contain bacteria and should be thrown away. A good practice is to wash your face and hands before and after applying cosmetics. If you are using makeup from a “communal” make-up kit, use a clean brush or your hands to apply. Shared makeup should not be applied directly to your face.

The Center for Safety in the Arts offers these guidelines for shared makeup users:

- 1) Creme sticks: slice these out with dental spatulas on to individual papers such as butter trays. Label and reuse them individually for touch-ups.
- 2) Lipsticks: These too can be sliced and labeled. For a long running show, individual lipsticks should be provided.
- 3) Pancakes and powders: Powdered products provide a less viable environment for infection, but try to individualize usage. Supply powders in the smallest containers available.
- 4) Mascara: Use individual applicators/containers if possible.
- 5) Eyeliners and Eye makeup: Use individual products if possible.
- 6) Brushes: Use disposable brushes.
- 7) Sponges: Use disposable sponges whenever possible. Reusable ones can be disinfected. Give out individual sponges at the beginning of a show, and maintain separate use.
- 8) Miscellaneous: Any type of facial hair, skullcaps, sequins, or other face product should be disinfected before used by a new performer. Use an approved bactericide for disinfection. These types of products should be carefully stored in labeled individual plastic bags between performances.

Makeup artists should make a practice of washing their hands between actors. Sponges and brushes should be washed after use on each individual.

When removing spirit gum or latex, avoid prolonged skin contact with solvents. Moisturizers can be used to replace lost skin oils and to help guard against dermatitis.

B. Fatigue

Fatigue is a serious safety concern that should be considered during all stage productions. With performance dates approaching, most crewmembers can become severely overworked.

Follow these simple guidelines to avoid fatigue:

- Get proper rest. The average person requires 8-9 hours of sleep per night.
- Limit drugs that might contribute to fatigue (tranquilizers and cold/allergy medications)
- Reduce caffeine, nicotine and alcohol, which can also contribute to fatigue.
- Take frequent breaks while working. Repetitive or long work sessions can reduce one's ability to concentrate on the work at hand.
- Plan ahead. Having your building materials and equipment ahead of time can increase efficiency and reduce the work time required.
- Know when to quit. Recognize signs of fatigue – loss of concentration, slow reaction times, memory loss – and knock off for the day.



C. Heat Stress

Theater spaces are often without air-conditioning and, even if they are air-conditioned, stage lighting can produce an incredibly hot glow. Add to that the stress and/or excitement of performing and cast members are prime candidates for heat stress. Working in hot conditions may pose special hazards to safety and health.

Drink plenty of liquids during a performance to replace the fluids lost from sweating – as much as one quart per hour may be necessary. Water and/or sports drinks are recommended. Caffeinated beverages such as cola, iced tea and coffee should be avoided.

STRIKE

A. Set Deconstruction & Material Disposal

All items must be returned to storage or otherwise disposed of immediately following the final performance, e.g.:

- lighting instruments, cables and control equipment
- properties
- sound equipment
- scenery and platforms
- costumes
- seating

Set deconstruction should take place in a careful, organized manner

B. Housekeeping

The facility must be left in good condition after the strike

C. Chemical Waste Disposal

Most commonly used organic solvents (e.g., acetone, methanol, toluene, mineral spirits, turpentine) and paints are considered hazardous waste and cannot be disposed of with regular trash or poured down the drain. See Section 15 – *Environmental Management* for additional information. If you have hazardous waste to be disposed of, contact Manager of Environmental Health & Safety for recommendations and instructions.



SECTION 19—ART SAFETY

- 19.1 Painting and Drawing**
- 19.2 Printmaking**
- 19.3 Ceramics**
- 19.4 Woodworking**
- 19.5 Welding**
- 19.6 Brazing, Soldering, Casting and Smiting**
- 19.7 Stained Glass**
- 19.8 Photography and Photoprinting**
- 19.9 Textile Arts**

Revised: October 2008
Draft Date: September 2003

19.1 PAINTING AND DRAWING

A. Objective

To provide safety rules and procedures to follow while working with paints and drawing materials.

B. Scope

It is applicable to all members of the college community including, but not limited to instructors and students. Any questions or comments regarding this manual should be directed to the Manager, Environmental Health & Safety in Physical Plant.

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in painting and drawing. In addition to this Section 19-Art Safety, Section 7-Hazard Communication, shall also be followed to ensure compliance with the federal Hazard Communication regulation.

The hazards associated with painting and drawing are of three main types:

1. Pigment Hazards: Inhalation hazard – working with raw powdered pigments, using dusty chalks or pastels, sanding or chipping paints, airbrushing or spray painting, and heating or torching paints until pigments fume. Skin contact with pigments is less hazardous. Pigments are not usually absorbed in significant amounts by skin contact, but some can cause dermatitis or skin irritation. Always wash hands after handling pigments, especially before eating.

2. Vehicle Hazards: Common vehicles are oils, wax, water, egg yolk, casein, resins, and polymer emulsions and solvent solutions. These vehicles often contain additives for workability and drying time and preservatives. Vehicle ingredients are volatile (will evaporate into the air) and nonvolatile. The nonvolatile are safer since they do not become airborne unless used in a technique that make them airborne, such as spray painting. Acrylic paints usually contain ingredients that release ammonia and formaldehyde gases when they dry.

3. Solvent Hazards: Solvents may be found in paints and inks or may be used to thin and clean up materials. Solvents are also found in products used with painting and drawing, such as varnishes, shellacs, lacquers, and fixatives. There are no "safe" solvents. All solvents, natural or synthetic, are toxic. Solvents can irritate and damage the skin, eyes, and respiratory tract, cause a narcotic effect on the nervous system, and damage internal organs, such as the liver and kidneys. Solvents are also a fire and explosion hazard so, all solvents should be isolated from sources of heat, sparks, flame and static electricity.

Refer to the products MSDS for information. The following is a summary of some of the types of solvents.

Bad solvents:

Turpentine: causes dermatitis, asthma, kidney and bladder damage, use odorless paint thinner instead.

Limonene, d-limonene, citrus oil, citrus turps, methadone, deperylene: a pesticide, cancer, more toxic than turpentine.

N-hexane, normal hexane: Potent nervous system toxin and extremely flammable, substitute heptane.

Better solvents:

VM&P naphtha or "Odorless paint thinner": good substitute for turpentine

Alcohols: ethyl alcohol, ethanol, grain alcohol, denatured alcohol, isopropyl alcohol, propanol and rubbing alcohol.

N-heptane: good substitute for hexane and other fast-drying solvents.

E. Safety Rules:

1. Obtain & review Material Safety Data Sheets (MSDS) on all paints, inks, thinners, varnishes, and other chemical products. (See Section 7-Hazard Communication for more information on MSDS and labeling requirements.)
2. Know and explain hazards and/or special precautions from the MSDS to students.
3. Label all containers, even temporary baby food jars, with name and hazards of the chemical.
4. Use water-based products over solvent-containing ones whenever possible.
5. Buy premixed paints, and avoid working with powdered pigments or dry pastels if possible.
6. Choose brushing and dipping techniques over spray methods whenever possible.
7. Avoid dusty procedures. Sanding dry paints, sprinkling dry pigments or dyes on wet paint or glue, and other techniques that raise dust or perform in an area with exhaust or outdoors.
8. Spray and/or airbrush must be conducted in spray booth.
9. Keep fire, heat, spark and flame away from solvents. Amounts larger than one gallon should be stored in a flammable-storage cabinet.
10. Avoid skin contact with paints, pigments and solvents by wearing gloves. Wash off paint splashes with safe cleaners such as baby oil followed by soap and water, nonirritating waterless hand cleaners or plain soap and water. Never use solvents or bleaches to remove splashes from your skin.
11. Wear goggles if using caustic paints or corrosive chemicals.
12. If respirators are used special rules regarding their use apply.
13. Avoid ingestion of materials; eat, smoke, or drink outside the work area. Never point brushes with your lips or hold brush handles in your teeth. Wash your hands before eating, smoking, applying make-up or other personal hygiene.
14. Keep containers of paint, powdered pigment, solvents, etc., closed when you are not using them.
15. Clean up spills immediately. Use spill clean up kit for spills larger than a paper towel or sponge. Evacuate the room and call 911 for spill clean up of spills larger than the spill kit. Wet-mop and sponge dusty surfaces, do not sweep.
16. Do not dispose of solvents down the drain. Collect all solvents, pigments and oil-based products in a labeled container for proper disposal by the college.
17. In case of fire or life-threatening emergency dial 911.

19.2 PRINTMAKING

A. Objective

To provide safety rules and procedures to follow while printmaking.

B. Scope

It is applicable to all members of the college community including, but not limited to instructors and students. Any questions or comments regarding this manual should be directed to the Manager of Environmental Health & Safety in Physical Plant.

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in printmaking. In addition to this Section 19-Art Safety, Section 7-Hazard Communication, shall also be followed to ensure compliance with the federal Hazard Communication regulation.

Printmaking inks are oil-based or water-based that dry or set by evaporation, polymerization, or by penetrating the material in which they are printed. The three basic components are pigments, vehicles and solvents.

Pigments can be classified as inorganic or organic chemicals, both of which can contain toxic substances. Benzidine is one of the chemical classes of organic dyes and pigments, which is a known bladder carcinogen. There is also evidence of toxicity and cancer with anthroquinone dyes and pigments. Some natural pigments can also be toxic, so it is important to research and obtain the MSDS on all pigments used in printmaking.

Vehicles are the mixtures of oils, solvents and oils, and polymer emulsions. MSDS are important to know the chemical make up of the vehicle.

Solvents are used in the ink components, as modifiers and for clean-up. It is important to select the least toxic solvent for the job. There are no "safe" solvents. All solvents, natural or synthetic, are toxic. Solvents can irritate and damage the skin, eyes, and respiratory tract, cause a narcotic effect on the nervous system, and damage internal organs, such as the liver and kidneys. Solvents are also a fire and explosion hazard so, all solvents should be isolated from sources of heat, sparks, flame and static electricity.

Refer to the products MSDS for information. The following is a summary of some of the types of solvents.

Bad solvents:

Turpentine: causes dermatitis, asthma, kidney and bladder damage, use odorless paint thinner instead.

Limonene, d-limo-nene, citrus oil, citrus turps, methadone, depentene: a pesticide, cancer, more toxic than turpentine.

N-hexane, normal hexane: Potent nervous system toxin and extremely flammable, substitute heptane.

Better solvents:

VM&P naphtha or “Odorless paint thinner”: good substitute for turpentine

Alcohols: ethyl alcohol, ethanol, grain alcohol, denatured alcohol, isopropyl alcohol, propanol and rubbing alcohol.

N-heptane: good substitute for hexane and other fast-drying solvents.

Acid and etching of metal is done by two processes:

1. Application using an acid to “eat” into the plate and converting the metal into a soluble salt. This process uses corrosive such as the following:

Strong, dangerous corrosive acid etchers:

Hydrochloric acid and nitric acid can cause skin and eye burns and damage the respiratory system. Other dangers include if nitric acid will spontaneously combust if mixed with sawdust, paper, or other cellulosic material. Hydrochloric acid and nitric acid combined to form “aqua regia” can produce nitrosyl chloride, a highly irritating gas. Nitric acid combined with concentrated acetic acid can explode. Nitric acid can also ignite or explode with many solvents.

Dutch mordant (potassium chlorate/water/hydrochloric acid) is highly corrosive. During the mixing of the mordant, highly toxic chlorine gas is generated. Potassium chlorate forms an explosive or violent reaction when mixed with nitric acid and with combustible substances, ex. sugar, rosin, charcoal, sawdust and sulfur. Potassium chlorate mixed with sulfuric acid creates the strongest simple acid known: perchloric acid. A mere drop of perchloric acid on paper has been known to detonate.

Citric acid added to ferric chloride to make “Edinburgh etch” only creates hydrochloric acid is not any safer.

Phosphoric acid used to clean stones is corrosive to the skin, eyes and respiratory tract.

Phenol (carbolic acid) is highly toxic by both skin absorption and inhalation. Skin contact with concentrated phenol for even several minutes can be fatal.

Safer, less corrosive chemical etchers are:

Ferric chloride solutions require only a small amount of ventilation to remove gases created during etching.

Copper sulfate solutions in various concentrations can be used to etch zinc.

E. Safety Rules:

1. Obtain & review Material Safety Data Sheets (MSDS) on all inks, solvents and other chemical products. (See Section 7-Hazard Communication for more information on MSDS and labeling requirements.)
2. Know and explain hazards and/or special precautions from the MSDS to students.
3. Label all containers, even temporary baby food jars, with name and hazards of the chemical.
4. Use water-based products over solvent-containing ones whenever possible.

19.3 CERAMICS

A. Objective

To provide safety rules and procedures to follow while working with ceramics

B. Scope

It is applicable to all members of the college community including, but not limited to instructors and students. Any questions or comments regarding this manual should be directed to the Manager of Environmental Health & Safety in Physical Plant.

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in ceramics. In addition to this Section 19-Art Safety, Section 7-Hazard Communication, shall also be followed to ensure compliance with the federal Hazard Communication regulation.

The hazards associated with ceramics include the following:

1. Physical Hazards: Overuse and strain injuries from wedging, throwing and hand building with clay. Noise from machinery and skin problems that include chapping and drying of the skin and bacterial and fungal infections of the skin and nail beds. Wet clay harbors bacteria and molds and dry clay is dusty, so people with asthma or allergies should avoid the area.
2. Glaze Hazards: Glazes are a mixture of minerals, metallic compounds and water. The metallic elements function in glazes as fluxes and colorants. Their toxicity varies greatly. Lead glazes shall not be used. Mixing and applying the glazes should be done with appropriate ventilation.
3. Firing Hazards: When clays and glazes are fired, they release various gases, vapors and fumes. All firing process require ventilation. A carbon monoxide detector shall be located near inside kilns.

E. Safety Rules

1. Keep all tools, machinery, and potter's wheels in good condition.
2. Use proper eye protection. Clear impact goggles should be worn when grinding or chipping. Infrared-blocking goggles should be worn when looking into glowing kilns, use shade number 3 or 4.
3. All materials should be labeled with the name of the substance and hazard warnings. It is best to keep materials in their original containers, with original labels.
4. Material Safety Data Sheets should be easily accessible for all chemicals.
5. Practice good hygiene, wash hands carefully and use a nail brush after glazing. Clean all surfaces and wipe up spills immediately.
6. Do not eat or drink in the studio.



7. Avoid skin problems. Keep broken skin from contact with clay and glazes. People with skin conditions can wear medical gloves, be aware of latex glove allergies.
8. Avoid ergonomic injuries by taking frequent breaks, never work to the point of exhaustion or pain. When wedging, keep the wrist in a neutral position and use the weight of the upper body rather than just the muscle of the upper arm.
9. Avoid lifting injuries. Buy supplies in 25 lb. containers or less and keep heavy supplies stored at waist level to avoid bending at the back. Always remember to lift with the legs, not the back.
10. Avoid processes that create airborne toxins such as mixing clay, purchase pre-mixed instead, sanding greenware, spraying glazes (apply with a brush) and similar processes.
11. Use cold-wax emulsions when possible. If wax is melted, do so in a ventilated area, use electric heat (no open flame) and double boiler to keep wax from being heated above 100 degrees C.
12. Clean floors without creating dust. Do not sweep. Wet mop and use a HEPA vacuum.

19.4 WOODWORKING

A. Objective

To provide safety rules and procedures to follow while woodworking.

B. Scope

It is applicable to all members of the college community including, but not limited to instructors and students.

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in woodworking. In addition to this Section 19-Art Safety, Section 7-Hazard Communication and Section 20-Machine Guarding, shall also be followed to ensure compliance with the federal safety regulations.

The hazards associated with woodworking include the following:

1. Machine Hazards – From woodworking machines, also see Section 20-Machine Guarding.

2. Dust Hazards – This includes fire hazards and occupational illnesses.

Fine wood dust can explode with tremendous force if ignited with a spark or match. Good housekeeping along with ventilation must be maintained to clean up wood dust and wood scraps.

There are 4 main occupational illnesses associated with wood dust:

- **Dermatitis** – This includes irritant dermatitis that is associated with exposure to the sap and bark of some trees. There is also sensitization dermatitis that results from an allergy to sensitizing substances in some wood, this is especially the case with dark and exotic woods. The darker the color, the more chemicals are likely to be in the wood. This is because the major ingredient in wood is cellulose, which is white and is not an allergen.
- **Respiratory system effects** – This includes damage to the mucus membranes and dryness and soreness of the throat, larynx and trachea, caused by some woods, especially sequoia and western red cedar. The dust can also cause lung problems like asthma and alveolitis (inflammation of the lungs' air sacs).
- **Cancer** – Most prevalent cancer is of the nasal cavity and nasal sinuses. Hardwoods are more often associated with cancer than softwoods, but both should be used with ventilation and good housekeeping.

3. Chemical Hazards – This includes chemicals such as glues, adhesives and paint strippers. Many skin conditions and allergies can be caused by wood glues and adhesives. In general, polyvinyl acetate (PVA) emulsion glues or white glues are more safe than other types of wood glue. Paint removers are either highly toxic solvent



mixtures or strong caustic removers. Gloves, goggles, protective clothing and ventilation is all needed for chemical stripping. Sanding, chipping and torch or heat-gunning paint is also very hazardous.

E. Safety Rules

1. Prevent fires by providing good shop ventilation, dust collection and control, sprinkler systems or fire extinguishers and good housekeeping.
2. Maintain Material Safety Data Sheets (MSDS) on all products, glues, solvents and chemicals.
3. Avoid wood treated with PCP, arsenic, or creosote.
4. Prevent hearing damage with quiet machines and keep machines well oiled and maintained.
5. Prevent vibration syndrome by using tools that are ergonomically designed and produce low vibrations. Also don't grasp tools too tight or work in cold conditions.
6. Wear dust goggles and dust masks when dust cannot be controlled, such as during hand sanding.
7. Practice good hygiene. Wash hands often, especially before eating and when leaving the studio. Vacuum rather than sweep wood dusts.
8. Follow all rules for solvents and solvent containing paints and glues. Never dispose of solvents down the drain. Store in flammable cabinets and away from heat or flame.

19.5 WELDING

A. Objective

To provide safety rules and procedures to follow while welding.

B. Scope

It is applicable to all members of the college community including, but not limited to instructors and students.

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in welding. In addition to this Section 19-Art Safety, Section 7-Hazard Communication and Section 22-Cutting and Welding (Hotwork), shall also be followed to ensure compliance with the federal safety regulations.

Welding safety is an extraordinary complex subject due to the various types of welding: oxyacetylene, arc, MIG, TIG, and plasma arc welding and cutting. The safety rules differ on the type of welding, the kind of work, and on the shop or on-site conditions.

The hazards associated with welding and safety precautions include the following:

1. Good Housekeeping: Welding shops should be kept clean and organized at all times. Combustible materials should be eliminated from the area or covered with a fireproof tarp or other protective material. Floors should be free of trip hazards, often the welder's vision is limited by face shields or goggles.

2. Electrical Safety: Shocks are a hazard when working with welding equipment. Use only welding equipment that meets standards. Follow all equipment operating instructions. Keep clothes dry and do not work in wet conditions. Maintain all electrical connections, cables, electrode holders, etc., and inspect each before starting to weld.

3. Compressed Gas Cylinder Safety: The compressed gas cylinders are potential rockets or bombs. All cylinders must be secured upright to a stable surface (wall, table or cart) at all times. There are also hazards associated with the gas:

- i. Oxygen will only burn at the proper air concentration, but with the proper concentration and fuel source, it can create violent explosions. Never use oxygen as a substitute for compressed air. Oxygen should not be stored with fuel cylinders or combustible materials.
- ii. Fuel gas is acetylene, propane and butane. They are all flammable and can burn and/or explode.
- iii. Shielding gases are used in MIG and TIG welding. They are inert gases that include argon, carbon dioxide, helium and nitrogen. If used in enclosed spaces they can displace the air and cause asphyxiation.



4. Fire Safety: Many fires start by welding sparks. Welding shops must be always kept free of combustible materials. OSHA regulations require welding be kept at least 35 feet away from any area where wood dust and chips may be located or created. This also applies to portable welding units. Fire extinguishers should be easily accessible.

5. Health Hazards: This includes radiation, heat, noise, fumes, gases from welding process and from compressed gases.

- i. Radiation takes three forms: visible, infrared and ultraviolet.
 1. Visible light is the least hazardous, intense light produces only temporary visual impairment, eyes should still be protected from strong light.
 2. Infrared (IR) is produced when metal is heated until it glows. IR can cause temporary eye irritation and discomfort. Repeated exposure can cause permanent eye damage that occur slowly and without notice.
 3. Ultraviolet (UV) is the most dangerous. All forms of arc welding produce UV radiation. Eye damage is called "flash burn" and can be caused in less than a minute's exposure. Symptoms do not appear until several hours after exposure. Severe burns become excruciatingly painful, and permanent damage may result. UV can also damage exposed skin, with long term exposure resulting in benign and malignant skin tumors.
- ii. Heat can harm welders by causing burns and by raising body temperature to hazardous levels causing heat stress.
- iii. Noise can damage hearing, most welding processes are not at damaging levels (except possibly air carbon arc cutting). If you do wear hearing protection such as earplugs make sure they are fire resistant.
- iv. Fumes and gases are produced during the welding process. Fumes come from vaporized metal and gases come from the compressed gas in cylinders or can be created when substances burn during welding. Many occupational illness are associated with substances found in welding fumes and gases. Have Material Safety Data Sheets (MSDS) for all compressed gases as well as all welding and brazing rods. Avoid materials that emit toxic fumes such as beryllium, thorium, cadmium, antimony and lead. Never work with metals of unknown composition, painted metals, or junk or found metals unless ventilation is certain to provide complete removal of the welding plume. Welding should be done in only areas that provide proper ventilation.

6. Personal Protective Equipment: This includes respiratory protection, eye protection and protective clothing. If adequate ventilation can not be provided, respiratory protection may be appropriate depending on the material and type of welding that is being done. HEPA filters will protect individuals from metal fumes, but offer no protection from gaseous contaminants. Use eye protection such as goggles or face shields to protect each welder for the specific type of welding being done. Visitors or other workers should also wear safety glasses. Protective clothes should include long sleeve shirts and long pants. Preferred fabrics are wool or flame retardant treated cotton. Never wear polyester or synthetic fabrics that can melt and adhere to skin when heated. Pants and shirts should not have pockets, cuffs or folds into which sparks may fall. Hair should be covered or at least tied back. Gloves should be worn when arc welding.

19.6 BRAZING, SOLDERING, CASTING AND SMITHING

A. Objective

To provide safety rules and procedures to follow while brazing, soldering, casting and smiting.

B. Scope

It is applicable to all members of the college community including, but not limited to instructors and students.

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in brazing, soldering, casting and smithing. In addition to this Section 19-Art Safety, Section 7-Hazard Communication, shall also be followed to ensure compliance with the federal Hazard Communication regulation.

The hazards associated with brazing, soldering, casting and smithing and safety precautions include the following:

1. Brazing and Soldering – Brazing alloys can contain an array of toxic metals including. Silver and copper brazing alloys may contain cadmium, antimony and arsenic. Solders can contain a large number of metals including: lead, tin, cadmium, zinc, arsenic, antimony, beryllium, indium, lithium and silver. Solders made for use on copper water pipes and cooking utensils are safer. The following are precautions for soldering and brazing:
 - i. Obtain Material Safety Data Sheets and complete alloy composition for all solders and brazing metals. Avoid toxic metal-containing alloys, such as those containing arsenic, cadmium and beryllium. Do not use lead solder.
 - ii. Obtain ingredient information on fluxes. Choose the safest flux for the job. Avoid fluoride fluxes and do not mix fluxes.
 - iii. Wear goggles that will protect the eyes from infrared radiation and irritating vapors. Use gloves when working with solvents, acids or caustic cleaning agents. Minimize skin contact with fluxes. Wear clothes that are resistant to heat.
 - iv. Work in areas with proper ventilation.
 - v. Braze at the lowest temperature possible. Use gun or electric soldering iron methods over open-flame joining or heating of irons. Avoid open dip pot tinning, unless excellent local exhaust is established.
 - vi. Obtain ingredient information on metal cleaners and degreasers, and choose the safest ones. Do not mix cleaning agents. Use putty or whiting to clean when possible.
 - vii. Practice good housekeeping. Clean using wet methods to control dust which maybe contaminated with metal fume particles.



2. Metal Casting and Foundry – This involves forcing molten metal (by gravity or centrifugal force) into a mold. The hazards involve exposure to mold materials, burning out patterns and working with molten metals. The following are precautions for casting and foundry:
 - i. Obtain Material Safety Data Sheets and ingredients lists for all metals, molds and patterns used. Choose the least toxic products.
 - ii. Choose foundry sands over cold-setting sands and resin binders. Use non-silica materials such as zircon when possible.
 - iii. Use the safest mold-release agents, such as graphite or asbestos-free talc.
 - iv. Work in areas with appropriate local exhaust ventilation for burn-out of any pattern materials. If possible do not use nitrogen containing plastic patterns when heated they generate hydrogen cyanide gas.
 - v. Avoid using metals that contain: arsenic, antimony, cadmium, nickel or chrome. Do not cast in lead.
 - vi. Wear protective clothing for casting and foundry.
 - vii. When centrifugal casting, make sure the equipment is well balanced and that the protective shield is in good condition.

3. Smithing (or forging) – This is the process of hammering hot or cold metals into shape. Hazards include the noise that is created with hammering on metal can cause hearing damage. There are also toxic combustion products such as carbon monoxide from the forging furnaces and infrared radiation from furnaces and hot metal that can damage eyes and cause skin burns. Fires are also a constant threat. The following are precautions for smithing:
 - i. Install fireproof, sound absorbing materials in the floors and walls of the shop when possible.
 - ii. Provide good stack exhaust and canopy hood ventilation for forges and furnaces. Carbon monoxide detectors shall also be installed .
 - iii. Eliminate all combustibles from areas around forges and furnaces.
 - iv. Wear earplugs or other suitable hearing protection and wear goggles to protect the eyes from infrared radiation.
 - v. Wear fire/burn protective clothing and wear gloves and goggles when handling acids, caustics or solvents.

19.7 STAINED GLASS

A. Objective

To provide safety rules and procedures to follow while working with stained glass.

B. Scope

It is applicable to all members of the college community including, but not limited to instructors and students.

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in stained glass. In addition to this Section 19-Art Safety, Section 7-Hazard Communication, shall also be followed to ensure compliance with the federal Hazard Communication regulation.

The major hazard in stained glass was the use of lead solder, but there are now new lead-free solders that should be used. These lead free solders are made of silver, tin, copper and zinc. The other hazard is the scoring and breaking of glass.

E. Safety Rules

1. Floors and work surfaces should be made of materials that are easily sponged and mopped clean.
2. Only use lead-free solders and avoid solders that contain significant amounts of arsenic, cadmium, antimony and other highly toxic materials.
3. Wear protective eyewear that is rated for both impact and dust exposure for cutting, grinding and/or polishing glass
4. Use wet grinding, polishing and cutting methods whenever possible.
5. Practice good housekeeping. Clean the studio with wet methods and sponge surfaces. Clean up shards and scraps as you work.

19.8 PHOTOGRAPHY & PHOTOPRINTING

A. Objective

To provide safety rules and procedures to follow while working in photography and photoprinting.

B. Scope

It is applicable to all members of the college community including, but not limited to instructors and students.

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in photography and photoprinting. In addition to this Section 19-Art Safety, Section 7-Hazard Communication, shall also be followed to ensure compliance with the federal Hazard Communication regulation.

The diseases associated with photoprinting include some of the following:

Skin Diseases: Many types of dermatitis have been seen in photographers:

1. Irritant contact dermatitis and chemical burns from exposure to irritating chemicals, such as acids and bleaches.
2. Allergic contact dermatitis from many developer chemical, such as metol and p-phenylenediamine.
3. Hyper- and hypopigmentation (dark and light spots) from exposure to developing chemicals, such as hydroquinone.
4. Lichen planus (an inflammatory condition characterized by tiny red-dish papules that may darken and spread to form itchy, scaly patches and ulcerations) thought to be caused by some color developers.
5. Skin cancer from exposure to ultraviolet light sources, such as carbon arcs. (There is also a potential for cancer to develop in lichen planus.)

Respiratory Diseases: Photochemical baths emit substances that are recognized by their typical darkroom odor. There can be a variety of respiratory diseases depending on the dose of exposure to darkroom chemicals. Common darkroom air contaminants include:

1. Acetic acid used in stop baths is a respiratory irritant
2. Formaldehyde a hardener and preservative is a sensitizer, irritant and animal carcinogen.
3. Hydrogen sulfide is emitted by some toners it is highly toxic to nervous system and an irritant. Sulfur dioxide is created due to a break down of sulfites in baths and in some toners, it is a respiratory irritant and sensitizer.

E. Safety Rules

1. Obtain & review Material Safety Data Sheets (MSDS) on all chemical products. See Section 7- Hazard Communication for information about MSDS and chemical labeling.
2. Choose the safest materials. Do not use extremely toxic chemicals such as those containing chromic acid, lead, mercury, uranium, or cyanide.
3. Know and explain hazards and/or special precautions from the MSDS to students.
4. Label all containers, with name and hazards of the chemical.
5. Replace dry chemicals with premixed chemicals when possible.
6. Do not use or store glacial acetic acid. Purchase acetic acid diluted to concentration of 50% or less.
7. Dilute or mix chemicals where there is exhaust ventilation. Always add acid to water, never the reverse.
8. Store photochemicals in the original containers when possible. Never store photochemicals in glass bottles, which can explode under pressure.
9. Use proper personal protective equipment such as chemical splash goggles, tongs, gloves and aprons. If chemicals do come in contact with skin, do not allow to dry, wash the effected skin with water.
10. Silver-containing solutions, complex photochemicals, solvents and metal containing toners must not be poured down the drain, but must be collected in a separate, labeled container for pick up and proper disposal by the college.
11. Do not allow heat or ultraviolet (UV) light (from carbon arcs or the sun) to affect stored photochemicals. For example, ferri- and ferro-cyanides can release hydrogen cyanide gas is exposed to heat or UV. These chemicals must also not be poured down the drain.
12. Clean up spills immediately. Use spill clean up kit for spills larger than a paper towel or sponge. Evacuate the room and call 911 for spill clean up of spills larger than the spill kit. Wet-mop and sponge dusty surfaces, do not sweep.
13. In case of fire or life-threatening emergency dial 911.

19.9 TEXTILE ARTS

A. Objective

To provide safety rules and procedures to follow while working with textiles.

B. Scope

It is applicable to all members of the college community including, but not limited to instructors and students.

C. References

Department of Labor, Occupational Health and Safety Administration 29 Code of Federal Regulations 1910, Illinois Department of Labor 820 ILCS 225 Health and Safety Act, and "The Artist's Complete Health and Safety Guide", 3rd Ed. by Monona Rossol.

D. Procedure

The following safety information shall be communicated to all individuals involved in textile arts. In addition to this Section 19-Art Safety, Section 7-Hazard Communication, shall also be followed to ensure compliance with the federal Hazard Communication regulation.

The hazards associated with exposure to dye products, fiber hazards and the related safety precautions include the following:

1. Dye Products – Dyes are most hazardous in the powdered state. Skin contact and inhalation of even very small amounts of dyes in a concentrated form should be avoided. Dyes in liquid form are the safest to handle. However, liquid dyes can still be hazardous, because they have strong preservatives and inhibitors to keep the dye from degrading. The following are precautions for using dyes:

- i. Obtain Material Safety Data Sheets on all dyes and textile paints. If dyes and pigments are not identified by their Colour Index names and numbers or by their Chemical Abstracts Service numbers, ask the supplier for the information.
- ii. Choose water-based products over solvent-containing.
- iii. Buy premixed dyes or dyes that are packaged in packets that dissolve when dropped unopened into hot water can be handled safely.
- iv. Avoid procedures that raise dusts or mists such as sprinkling dry dyes or pigments on wet cloth or airbrushing.
- v. Avoid skin contact with dyes by wearing gloves.
- vi. Melt and remove wax at the lowest possible temperatures. Do not heat wax with open flames or on gas stoves. Use electric stoves or fry pans with good heat control. Use wax emulsion products when possible.
- vii. Wear protective clothing and protect eyes by wearing chemical splash goggles.

2. Fibers – Working with fibers have resulted in occupational diseases such as dermatitis, skin and pulmonary diseases (weaver's cough or cotton lung is also known as brown lung or byssinosis) The following are precautions for working with fibers:

- i. Only purchase fibers and textiles from reliable suppliers who will provide information on the origin of the materials and what dyes or fiber treatments have been applied.



- ii. Purchase cleaned or washed fibers or textiles when possible.
- iii. Do not use mildewed or musty materials. Store fibers in clean, dry places to avoid microorganism growth.
- iv. Avoid dust. Damp-mop or sponge up dusts rather than sweeping or vacuuming.
- v. Obtain information on treatments applied to materials. If the work is to be installed in a public building it needs to be certified that it meets fire-retardant standards.
- vi. Adjust chair heights, looms, etc. for ergonomic comfort. Take breaks, stretch, and exercise to relieve strain.

SECTION 20—WALKING-WORKING SURFACES

- 20.1 Fall Protection
- 20.1 Fall Protection Permit
- 20.2 Ladder -Safe Work Practices & Selection
- 20.2 Ladder Inspection Checklist
- 20.3 Aerial Lift- Safe Work Practices & Selection
- 20.4 Aerial Lift Inspection Checklist
- 20.5 Aerial Lift Inventory
- 20.6 Scaffolding – Safe Work Practices and Selection

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20.1 FALL PROTECTION REQUIREMENTS

A. Objective

To protect employees and students from injury while working on elevated surfaces such as roofs, maintenance activities such as changing lighting, and/or in the theater, protection against falls must frequently be considered. Fall arresting systems, which include lifelines, body harnesses, and other associated equipment, are often used when fall hazards cannot be controlled by railings, floors, platforms, and other means. These systems are designed to stop a free fall of up to six feet while limiting the forces imposed on the wearer.

B. Scope

This procedure requires fall protection whenever the work is performed in an area that is four (4) feet higher than its surroundings. Exceptions to this rule include work done on scaffolds, ladders and stairways, derricks and cranes, and work involving electrical transmission and distribution. Also excluded is the performance of inspections, investigations, or assessments of existing conditions prior to the beginning or after the completion of construction.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910 Subpart F Section .66, Appendix C, 1926 Subpart M .501 and Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Types of Fall Protection

A variety of systems may be chosen from when providing fall protection. These systems include, but are not limited to:

Guardrails: Standard guardrails consist of a top rail, located 42 inches above the floor, and a mid-rail. Screens and mesh may be used to replace the mid-rail, so long as they extend from the top rail to the floor.

Personal Fall Arresting System: Components of a personal fall arresting system include a body harness, lanyard, lifeline, connector, and an anchorage point capable of supporting at least 5000 pounds.

Position Device Systems: Positioning device systems consist of a body belt or harness rigged to allow work on a vertical surface, such as a wall, with both hands free.

Safety Monitoring by a Competent Person: This system allows a trained person to monitor others as they work on elevated surfaces and warn them of any fall hazards.

Warning Line Systems: Warning line systems are made up of lines or ropes installed around a work area on a roof. These act as a barrier to prevent those working on the roof from approaching its edges.

Covers: Covers are fastened over holes in the working surface to prevent falls.



Additional Precautions

Protection should also be provided from falling objects. Work surfaces should be kept clear of material and debris by removing at regular intervals. Toeboards should be used to prevent objects from being inadvertently kicked to a lower level. When necessary, canopies should be provided.

E. Training

Training must include the following:

- How to recognize and minimize fall hazards.
- The nature of the fall hazards in the work area.
- Procedures for erecting, maintaining, disassembling, and inspecting the specific fall protection systems used.
- Use, operation, and limitations of fall protection systems.
- The user's role in fall protection systems.

20.1 FALL PROTECTION PERMIT

FALL PROTECTION PERMIT	
BEFORE INITIATING WORK IN THIS AREA, CAN THE JOB BE AVOIDED? IS THERE A SAFER WAY?	
This Fall Protection Permit is required for any work is performed in an area that is six feet higher than its surroundings. Exceptions to this rule include work done on scaffolds, ladders and stairways, derricks and cranes, and work involving electrical transmission and distribution.	
Work being done by: <input type="checkbox"/> Employee <input type="checkbox"/> Contractor _____	
Name of Employee Doing work:	
Department:	Date:
Location/Building:	Nature of Job:
I verify the above employee has received training in the following:	
<input type="checkbox"/> How to recognize and minimize fall hazards.	
<input type="checkbox"/> The nature of the fall hazards in the work area.	
<input type="checkbox"/> Procedures for erecting, maintaining, disassembling, and inspecting the specific fall protection systems used.	
<input type="checkbox"/> Use, operation, and limitations of fall protection systems.	
<input type="checkbox"/> The user's role in fall protection systems.	
<input type="checkbox"/> The employee has reviewed the EH&S Manual Section 22.1 Fall Protection Requirements.	
Signed: (Supervisor or Manager of Reg. Compliance)	
I have received the above training and understand the information provided: Signed: (Employee doing work)	
The Competent Person conducting safety monitoring is:	
Permit Expires:	Date: _____ Time: _____ AM PM
Other Precautions Taken:	

20.2 LADDER- SAFE WORK PRACTICES & SELECTION

A. Objective

Portable ladders are used at Harper in a wide variety of settings, both academic and administrative. Misuse of ladders can result in serious injuries from falls or, in the case of metal ladders, electrical shock. Portable ladders must be maintained in good condition at all times, and inspected at regular, frequent intervals. Training is also an important aspect of portable ladder safety and accident prevention.

B. Scope

This procedure is established to address the requirements for using portable ladders in all departments. This section does not address the OSHA requirements for fixed ladders.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910 Subpart D Sections 21, 22,25,.26 and Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Ladder Types

- Stepladder (or "A" frame ladder)-A self-supporting portable ladder, non-adjustable in length, having flat steps and a hinged back, additionally:
 - Shall not be longer than 20 feet.
 - Shall be equipped with a metal spreader or locking device of sufficient size and strength to securely hold the front and back sections in an open position
 - Further classified into 3 types based on their use:
 - Type I – Industrial stepladder 3-20 feet, for heavy duty use.
 - Type II – Commercial stepladder 3-12 feet, for medium duty use.
 - Type III – Household stepladder 3-6 feet, for light duty use.
- Single Ladder (or "straight" ladder) – A non-self supporting portable ladder, non-adjustable in length, consisting of but one section. Its size is designed by overall length of the side rail, additionally:
 - Shall not be longer than 30 feet.
- Extension Ladder – A non self-supporting potable ladder adjustable in length, additionally:
 - Shall not be longer than 60 feet.

E. Ladder Use Guidelines

The following are a list of guidelines to follow that help prevent accidents when using a portable ladder:

- Wear shoes with nonskid soles that are free of snow, mud or grease. Metal rungs can be very slippery in certain conditions.
- Ladders shall be placed on a stable, level base with a secure footing. Boxes barrels, or other unstable surfaces should never be used to obtain additional height. Additionally, ladders should not be placed on slippery surfaces unless secured by holding or lashing



- Ladders shall not be placed in front of doors opening toward the ladder unless the door is blocked open, locked, or guarded.
- Short ladders shall never be spliced together to make long ladders.
- Don't stand on the top step of a stepladder, and do not stand any higher than the third highest rung from the top of a straight ladder. This can make the ladder unsteady and leaves the user with no handhold.
- Straight or extension ladders should extend at least 3 feet above the point of support.
- Straight or extension ladders shall be set up using the 1-to-4 rule: the bottom of the ladder should be 1 foot away from the wall for every 4 feet that the ladder rises. For example, if the ladder touches the wall 16 feet above the ground, the feet of the ladder should be 4 feet from the wall.
- Overreaching can also cause instability. A good rule of thumb is to not let one's belt buckle outside the uprights. Also, when climbing or descending ladders, always face the ladder and hold onto each side rail.
- Ladders shall never be used in the horizontal position as scaffolds or work platforms.
- Metal ladders shall never be used near electrical equipment.
- Do not use a ladder as a seat between tasks. You might want to take a break from your chores, but never use a stepladder's top or pail shelf as a seat.

F. Care of Ladders

Ladders should be maintained in good conditions at all times, use the following Ladder Inspection Checklist as well as these inspection items:

- The joints between the steps and siderails shall be tight.
- Hardware and fittings shall be secure.
- Moveable parts shall operate freely.
- Metal bearings should be frequently lubricated.
- Frayed or worn rope shall be replaced.
- Safety feet and other auxiliary equipment shall be kept in good repair.
- Rungs shall be kept free of grease and oil.
- If tipped over, inspect for dents, bends, rungs, hardware security or other damage.
- Never paint ladders, as paint may hide defects that could lead to failure.

G. Training

Supervisors should cover the proper use, inspection of, and hazards related to portable ladders. Information should include the information included in this program, OSHA regulations as applicable and manufacturer recommendations on use of specific ladders. This may include the following topics:

- The nature of fall hazards,
- Correct usage, and
- Load-carrying capacities.

Those who use ladders near exposed electrical conductors should also receive training in electrical safety-related work practices.

20.2 LADDER INSPECTION CHECKLIST

Items to be checked:	Condition O.K.	Needs Repair
GENERAL		
Loose steps or rungs (consider loose if they can be moved by hand)		
Loose nails, screws, bolts, or other metal parts.		
Cracked, split or broken uprights, braces, steps or rungs.		
Slivers on uprights, rungs or steps.		
Damaged or worn nonslip bases.		
STEPLADDERS		
Wobbly (from side strain)		
Loose or bent hinge spreaders.		
Broken Stop on hinge spreaders.		
Loose hinges.		
EXTENSION LADDERS		
Loose, broken, or missing extension locks.		
Defective locks that do not seat properly when the ladder is extended.		
Deterioration of rope.		

If there are any items that “Need Repair” the ladder should immediately be taken out of service, tagged as “Dangerous – Do Not Use” and the responsible supervisor notified. If a ladder cannot be repaired, it should be destroyed.

20.3 AERIAL LIFTS -SAFE WORK PRACTICES & SELECTION

A. Objective

Aerial lifts are considered any of the following: all aerial devices to elevate personnel to work areas not accessible from the ground, including vehicle and non-vehicle mounted lifts with; extendible boom platforms; aerial ladders; articulation booms, vertical towers, and a combination of any such device.

Aerial lifts, like ladders are also used at Harper in a wide variety of settings, both academic and administrative. The dangers are also similar as ladders with hazards including injuries from falls and electrical shock. Lifts must be maintained in good condition at all times, and inspected at regular, frequent intervals. Individual training is required on the specific aerial lift.

B. Scope

This procedure is established to address the requirements for using aerial devices in all departments.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910.67 for Aerial devices and 1910.68 for Manlifts. Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Program Requirements

The following is a list of safety requirements for use of all aerial lift devices:

- Only trained and authorized personnel may operate aerial lifts. (Authorization must be from the Supervisor of the Department, see Section 20.4 Aerial Lift Inventory).
- Employees shall always stand firmly on the floor of the basket or platform and shall not sit, climb or lean on the edge of basket or the basket guardrails, nor shall they ever use planks, ladders or other devices within the basket or platform for positioning.
- A fall protection harness with a lanyard attached to the boom, basket or platform shall be worn at all times.
- Load limits on the basket or platform shall not be exceeded.
- Outriggers must be positioned and on pads or solid ground and breaks must be set.
- Do not work on slopes that exceed the slope limits listed by the manufacturer. Wheel chocks must be installed before the lift is used when working on an incline.
- Lift controls must be tested daily prior to operating and be clearly marked.
- The lift must not be moved when it is in an elevated position.
- If there is any malfunction or problem with the lift it should be immediately taken from service, tagged and notify the responsible supervisor.
- The manufacturer or equivalent shall certify any modifications.
- The area beneath an operating lift must be cordoned off and access to that area must be restricted, by placing barricades and signs.
- Employees must stay at least 10 feet away from overhead power lines, to prevent electrocution.

E. Care and Inspection of Aerial Lift Devices

Inspection by the manufacturer or a manufacturer representative shall be conducted annually, coordinated by the responsible supervisor, they shall further keep the inspection records.



F. Training

No person shall operate any aerial lift until they have been trained and certified on that specific lift. Training is required prior to permitting an employee to operate a lift (except for training purposes).

20.3 AERIAL LIFT INSPECTION CHECKLIST

Inspector: _____

Date: _____

Aerial Lift Make/Model: _____

Operation Checklist is to be used before EVERY use of the lift:

Items to be checked:	Condition O.K.	Needs Repair
Walk around the lift; look for loose or missing parts or visible damage		
Check controls for correct operation		
Operation is on a smooth, firm and level surface		
The platform load capacities are not exceeded		
Lifts with outriggers, are positioned properly before raising platform		
The area beneath an operating lift is cordoned off and access to that area is restricted with barricades and signs		
There is at least 10 feet of clearance between any part of the machine and any overhead electrical sources.		

Three Month Inspection

The following checklist should be completed on all aerial lifts every three months. In addition there are annual inspections made by a manufacture representative.

Items to be checked:	Condition O.K.	Needs Repair
All functions and their controls for speed(s) smoothness and limits of motion;		
Lower controls including the provisions for overriding of upper controls		
All chain and cable mechanisms for adjustment and worn or damaged parts		
All emergency and safety devices		
Lubrication of all moving parts, inspection of filter element(s), hydraulic oil, engine oil, and coolant as specified by the manufacturer		
Visual inspection of structural components and other critical components such as fasteners, pins, shafts and locking devices;		
Placard, warnings and control markings		

If there are any items that “Need Repair” the lift should immediately be taken out of service, tagged as “out of service” and the responsible supervisor notified. Repairs should be made only by a manufacture representative.

20.3 AERIAL LIFT INVENTORY

Name (Manuf.)	Capacity	Maximum Platform Height	Power Source	Department Responsible	Supervisor to contact for authorization to use	Storage Location
Genie AWP-25S	350 lb. One person	24 feet	Electric	Box Office	Thom Lange	J bldg.
JLG30	350 lb. One person	30 feet	Electric	Box Office	Thom Lange	R bldg.
JLG30	350 lb. One person	30 feet	Electric	Maintenance	Jerry Goff	W bldg.
JLG36	300 lb. One person	36 feet	Electric	Maintenance	Jerry Goff	Y bldg.
Upright UL38	300 lb. One person	38 feet	Electric	Maintenance	Jerry Goff	M bldg.
Skyjack 4626	700 lb. Two person *Extension platform -300 lb. One person	20 feet	Electric	Maintenance	Jerry Goff	Avante
Upright AB-46 I/C	500 lb. Two person	46 feet	Gas	Maintenance	Jerry Goff	Maint. Garage
JLG600	500 lb. Two person	60 feet	Gas	Maintenance	Jerry Goff	Maint. Garage
JLG19	350 lb. One person	19 feet	Electric	Utilities	Larry Olson	B bldg.

Updated: Sept. 2008

20.4 SCAFFOLDING- SAFE WORK PRACTICES & SELECTION

A. Objective

There may be the requirement to use scaffolding on campus. If and when any scaffolding is used these safe work practices and selection must be followed as well as all the rules and regulations that apply to erecting, dismantling, fall protection, furnishing and engaging in work on a scaffold in accordance with OSHA regulation in 1910 and 1926 CFR.

B. Scope

This procedure is established to address the requirements for using scaffolding in all departments.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910.28- Safety Requirements for Scaffolding and 1910.451-454.
Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Program Requirements

If it is determined that scaffolding is to be erected, the department supervisor must designate a **competent person** with specialized training to oversee the erecting, securing, and dismantling of the scaffolding. The competent person also inspects all scaffolds for visible defects before each work shift and after any occurrence that may affect the scaffolds' structural integrity. The competent person must have a complete grasp of functions, rules, and regulations as they pertain to the scaffold they oversee.

Competent persons will manage the daily activities on and around scaffolds and ensure the following:

- **Capacity**- Scaffolds and scaffold components must be capable of supporting, without failure, its own weight and at least 4 times the maximum intended load applied or transmitted to it.
- **Footing**-The footing or anchorage for scaffolds must be sound, rigid, and capable of supporting the scaffold and its maximum intended load without surface settling or displacement. Unstable objects such as barrels, boxes, loose brick, or concrete blocks must not be used to support scaffold or planks.
- **Planking** – All planking, if applicable, must be overlapped a minimum of 12 inches or secured from movement by nails or bolts, unless the scaffold is prefabricated and interlocking. If nails or bolts are used in the construction of the scaffold they must be of sufficient size and number to secure planks from movement.
- **Fall Protection** – Fall protection is required for any scaffold greater than 10 feet in height. Guardrails, midrails, and personal fall arrest system, when applicable, must be in place when the scaffold is being used by employees.
- **Electrical Safety** – A 10 foot distance rule must be taken into consideration when working near overhead power lines or any high voltage electrical equipment. (See Section 10-Electical Safety for more information).
- **Weather Stoppages** – Work on scaffolds is not allowed during high winds or when ice or snow collects on planking.

E. Training

All employees who are required to erect, work on or dismantle scaffolds must attend scaffold safety training. The designated competent person must be trained for the specific job as well as on the specific type of scaffolding. Training covers the proper use, inspection of and hazards relating to erection, working on and dismantling scaffolds.



SECTION 21–MACHINE GUARDING

21.1 Machine Guarding Requirements

Reviewed: October 2008
Date Accepted: April 2002
Draft Date: December 2001

21.1 MACHINE GUARDING REQUIREMENTS

A. Objective

To protect employees and students from injury while operating machines with moving parts. Safeguards are essential for protecting operators from needless and preventable injuries.

B. Scope

This procedure requires guarding for any machine where machine parts, functions, or processes may cause injury. The need for machine guarding may be found in machine shops in academic departments, maintenance shops, print shops, and other areas where mechanical equipment is used.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910 Subpart O Sections 211-219 and Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Program Requirements

Any machine part, function, or process, which may cause injury, must be safeguarded. When the operation of a machine or accidental contact with it can injure the operator or others in the area, the hazards must be either controlled or eliminated.

Where Mechanical Hazards Occur

Dangerous moving parts in three basic areas require safeguarding:

- **The point of operation:** that point where work is performed on the material, such as cutting, shaping, boring, or forming of stock.
- **Power transmission apparatus:** all components of the mechanical system which transmit energy to the part of the machine performing the work. These components include flywheels, pulleys, belts, connecting rods, couplings, cams, spindles, chains, cranks, and gears.
- **Other moving parts:** all parts of the machine which move while the machine is working. These can include reciprocating, rotating, and transverse moving parts, as well as feed mechanisms and auxiliary parts of the machine.

Hazardous Mechanical Motions and Actions

A wide variety of mechanical motions and actions may present hazards to the operator. These can include the movement of rotating members, reciprocating arms, moving belts, meshing gears, cutting teeth, and any parts that impact or shear. These different types of hazardous mechanical motions and actions are basic in varying combinations to nearly all machines, and recognizing them is the first step toward protecting operators from the danger they present.

The basic types of hazardous mechanical motions and actions are:

Motions:

- Rotating (including in-running nip points)
- Reciprocating
- Transferring

Actions

- Cutting
- Punching
- Shearing
- Bending

E. Requirements for Safeguards

Safeguards must meet these minimum general requirements:

Prevent contact: The safeguard must prevent hands, arms, and any other part of an operator's body from making contact with dangerous moving parts. A good safeguarding system eliminates the possibility of the operator or another worker placing parts of their body near hazardous moving parts.

Secure: Operators should not be able to easily remove or tamper with the safeguard, because a safeguard that can easily be made ineffective is no safeguard at all. Guards and safety devices should be made of durable materials that will withstand the conditions of normal use. They must be firmly secured to the machine.

Protect from falling objects: The safeguard should ensure that no objects can fall into moving parts. A small tool, which is dropped into a cycling machine, could easily become a projectile that could strike and injure someone.

Create no new hazards: A safeguard defeats its own purpose if it creates a hazard of its own such as a shear point, a jagged edge, or an unfinished surface which can cause a laceration. The edges of guards, for instance, should be rolled or bolted in such a way that they eliminate sharp edges.

Create no interference: Any safeguard, which impedes an operator from performing the job quickly and comfortably, might soon be overridden or disregarded. Proper safeguarding can actually enhance efficiency since it can relieve the operator's apprehensions about injury.

Allow safe lubrication: If possible, one should be able to lubricate the machine without removing the safeguards. Locating oil reservoirs outside the guard, with a line leading to the lubrication point, will reduce the need for the operator or maintenance operator to enter the hazardous area.

F. Protective Clothing and Personal Protective Equipment

Engineering controls that eliminate the hazard at the source and do not rely on the operator's behavior for their effectiveness offer the best and most reliable means of safeguarding. Therefore, engineering controls are the first choice for eliminating machine hazards. But whenever engineering controls are not available or are not fully capable of protecting the operator (an extra measure of protection is necessary),



operators must wear protective clothing or personal protective equipment (See *Section 6 – Personal Protective Equipment*).

If it is to provide adequate protection, the protective clothing and equipment selected must always be:

- Appropriate for the particular hazards
- Maintained in good condition
- Properly stored when not in use, to prevent damage or loss
- Kept clean, fully functional, and sanitary.

Protective clothing is, of course, available for different parts of the body. Hard hats can protect the head from the impact of bumps and falling objects when the operator is handling stock; caps and hairnets can help keep the operator's hair from being caught in machinery. If machine coolants could splash or particles could fly into the operator's eyes or face, then face shields, safety goggles, glasses, or similar kinds of protection might be necessary. Hearing protection may be needed when operators operate noisy machines. To guard the trunk of the body from cuts or impacts from heavy or rough-edged stock, there are certain protective coveralls, jackets, vests, aprons, and full-body suits. Operators can protect their hands and arms from the same kinds of injury with special sleeves and gloves. Safety shoes and boots, or other acceptable foot guards, can shield the feet against injury in case the operator needs to handle heavy stock, which might drop.

It is important to not that protective clothing an equipment can crate hazards. A protective glove, which can become caught between rotating parts, or a respirator facepiece, which hinders the wearer's vision, for example, require alertness and continued attentiveness whenever they are used.

Other parts of the operator's clothing may present additional safety hazards. For example, loose-fitting shirts might possibly become entangled in rotating spindles or other kinds of moving machinery. Jewelry, such as bracelets and rings, can catch on machine parts or stock and lead to serious injury by pulling a hand into the danger area.

G. Training

Even the most elaborate safeguarding system cannot offer effective protection unless the operator knows how to use it and why. Specific and detailed training is therefore a crucial part of any effort to provide safeguarding against machine-related hazards. Thorough operator training should be provide by the Supervisor or Instructor which, should involve instructions or hands-on training in the following:

- A description and identification of the hazards associated with particular machines.
- The safeguards themselves, how they provide protection, and the hazards for which they are intended.
- How to use the safeguards and why.
- How and under what circumstances safeguards can be removed, and by whom (in most cases, repair or maintenance personnel only).
- What to do (e.g., contact the supervisor) if a safeguard is damaged, missing, or unable to provide adequate protection.

This kind of safety training is necessary for new operators and maintenance or setup personnel, when any new or altered safeguards are put in service , or when operators are assigned to a new machine or operation.



SECTION 23–CUTTING & WELDING **(HOTWORK)**

23.1 Hot Work Operations

23.2 Hot Work Permit

Date Accepted: April 2002
Draft Date: December 2001

23.1 HOT WORK OPERATIONS

A. Objective

To protect Harper employees while conducting cutting and welding operations (commonly referred to as hot work) associated with machine shops, maintenance, and construction activities. Potential health, safety, and property hazards result from the fumes, gases, sparks, hot metal and radiant energy produced during hot work. Hot work equipment, which may produce high voltages or utilize compressed gases, also require special awareness and training on the part of the worker to be used safely. The hazards associated with hot work can be reduced through the implementation of effective control programs.

B. Scope

Cutting and welding operations are prohibited unless appropriate steps are taken to minimize fire hazards, such as removal or guarding of combustible materials and, when possible, restricting hot work to specially designated areas. Departments where hot work is performed are responsible for ensuring that adequate controls and procedures are in place before work begins.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910 Subpart Q Sections 252-255 and Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. General Hot Work Controls

If there is a practical and safer way to do the job without hot work, that method should be used. Where hot work must be done the area should be properly designated and prepared. Combustible and flammable materials within the work area should be protected against fire hazards and the operation should not pose a hazard to others in nearby areas. To help achieve this, the following controls should be used:

- Cutting and welding operations restricted to authorized, properly trained individuals;
- If possible, hot work performed in a properly designed shop area equipped with all necessary controls and adequate ventilation;
- Move combustible materials at least 35 feet from the work site. If this is not possible, protect combustible materials with metal guards or by flameproof curtains or covers (other than ordinary tarpaulins);
- Cover floor and wall openings within 35 feet of the work site to prevent hot sparks from entering walls or falling beneath floors or to a lower level;
- Fire resistant curtains and/or tinted shields used to prevent fire, employee burns, and ultra-violet light exposure.

E. Ventilation and Atmospheric Testing

Hot work should not be conducted in the presence of explosive mixtures of flammable gases, vapors, liquids, or dusts or where explosive mixtures could develop inside improperly prepared tanks or equipment. Atmospheric testing and monitoring for combustible gases and vapors should be done before work begins and at regular, predetermined intervals thereafter. Ventilation of the work site, either through local or general exhaust ventilation, should be adequate for the work performed.

F. Fire Protection

A person other than the operator should perform fire watch duties and remain at the work site for at least one hour after hot work operations have ended. Additionally, the following steps should be taken:

- An ABC type fire extinguisher must be available in shop areas where hot work is performed;
- An ABC type fire extinguisher must be attached to all portable cutting and welding carts;
- If a building or area is equipped with a sprinkler system, then that system must be operational when hot work is performed;
- A hot work permit is required for all temporary operation involving open flames or producing heat and/or sparks. This includes, but is not limited to: brazing, cutting, grinding, soldering, thawing pipes, torch-applied roofing and welding operations. The Supervisor or Project Manager should sign the hot work permit. See *Section 23.2 Hot Work Permit*

G. Personal Protective Equipment

Eye protection in the form of vented goggles or other suitable eye protection shall be used during all gas welding or oxygen cutting operations. Helmets or hand shields shall be used during all arc welding or arc cutting. All eye protection shall be not readily flammable and shall be capable of withstanding sterilization. The appropriate shade number shall be determined on the type of hot work being performed.

Personal protective equipment (PPE) specifically designed for hot work should be provided to and used by workers (See *Section 6 Personal Protective Equipment*). The potential or toxic fume emissions from the material being worked on or surface coatings should be considered, and appropriate steps should be taken to provide for respiratory protection.

H. Compressed Gas Cylinder Storage and Handling

Storage and handling of compressed gas cylinders are important parts of many cutting and welding operations. The following should be observed:

- Oxygen and fuel gas cylinders should be stored separately with the protective valve caps in place. Except when in use, oxygen and fuel gas cylinders should be stored at least 20 feet apart or separated by a noncombustible wall at least 5 feet high;
- Cylinder cars equipped with a cylinder restraint, such as a chain or strap, should be used for all transporting of compressed gas cylinders;
- Cylinders should be secured from tipping, in an upright position;
- Regulators must be compatible with the cylinder and its contents. Many regulators are similar in design and construction. Check the regulator's model number and compare that with the cylinder's requirements.

I. Training

The Supervisor and/or Contractor shall ensure that all persons performing hot work should be trained in proper equipment operation, handling and storage of welding materials, compressed gas safety, chemical hazards, and in working procedures, including the written hot work permit. Additional training may also be necessary in the proper selection and use of personal protective equipment.

23.2 HOT WORK PERMIT

HOT WORK PERMIT		
BEFORE INITIATING HOT WORK, CAN THIS JOB BE AVOIDED? IS THERE A SAFER WAY?		
<p>A Hot Work Permit is required for any <i>temporary</i> operation involving open flames or producing heat and/or sparks. This includes, but is not limited to: brazing, cutting, grinding, soldering, thawing pipes, torch-applied roofing and welding.</p>		
Instructions	Required Precaution Checklist	
1. Harper Supervisor or Contractor:	<input type="checkbox"/> Available sprinklers, hose streams and extinguishers are in service/operable. <input type="checkbox"/> Hot Work equipment in good repair. Requirements within 35 feet of work <input type="checkbox"/> Flammable liquids, dust, lint and oily deposits removed. <input type="checkbox"/> Explosive atmosphere in area eliminated. <input type="checkbox"/> Floors swept clean. <input type="checkbox"/> Combustible floors wet down, covered with damp sand or fire-resistive sheets. <input type="checkbox"/> Remove other combustibles where possible. Otherwise protect with fire-resistive tarpaulins or metal shields. <input type="checkbox"/> All wall and floor openings covered. <input type="checkbox"/> Fire-resistive tarpaulins suspended beneath work. Work on walls or ceilings <input type="checkbox"/> Construction is noncombustible and without combustible covering or insulation. <input type="checkbox"/> Combustibles on other side of walls moved away. Work on enclosed equipment <input type="checkbox"/> Enclose equipment cleaned of all combustibles. <input type="checkbox"/> Containers purged of flammable liquids/vapors. <input type="checkbox"/> Pressurized vessels, piping and equipment removed from service, isolated and vented. Fire watch/Hot Work area monitoring <input type="checkbox"/> Fire watch will be provided during and for 60 minutes after work, including any coffee or lunch breaks. <input type="checkbox"/> Fire watch is supplied with suitable extinguishers. <input type="checkbox"/> Fire watch is trained in use of this equipment and in sounding alarm.	
A. Verify precautions listed at right (or do not proceed with the work).		
B. Keep copy of the Permit on work site.		
C. Harper Supervisor keep original Permit.		
Hot work being done by:		
<input type="checkbox"/> Employee		
<input type="checkbox"/> Contractor _____		
Date:		
Location/Building & Floor:		
Nature of the Job:		
Name of Person Doing Hot Work:		
<p>I verify the above location has been examined, the precautions checked on the Required Precautions Checklist have been taken to prevent fire, and permission is authorized for this work.</p>		
Signed: (Harper Supervisor)		
Permit Expires:	Date:	Time: AM PM



SECTION 24–FIRE ALARM SYSTEM

- 24.1 Fire Alarm System Operation
- 24.2 Fire Alarm System Bypass Permit

Reviewed: October 2008
Date: Revised May 2008
Revised Sept. 2007
December 2006

24.1 FIRE ALARM SYSTEM OPERATION

A. Objective

To protect Harper community and property from fire in the form of alarm/detection systems, building notification systems and extinguishing systems. This procedure will cover responsibilities for the maintenance and testing of the fire alarm system as well as the procedure for either bypassing alarms and/or notification if the system is down due to impairments.

B. Scope

This procedure is applicable to the Physical Plant Department or any other department that may require changes or disabling of the fire alarm system and to Harper College Police Department (HCPD) which monitors the fire alarm system and may put the alarm in bypass per permit.

C. Definitions

Bypass – Alarm system is **operable**, only certain detection devices are temporarily taken off line. This situation is requested to and implemented by HCPD, from an Employee or Supervisor completing a Bypass Permit.

Impairment – Alarm system is **inoperable**, **NO** signal (alarm or trouble) is sent to HCPD and **NO** horns or strobes work to notify occupants of a problem. This may also include impairments of the fire sprinkler systems. This situation is due to a breakdown of the system and repairs must be made. There shall be **NO** “Hotwork” (see Section 23 for Hotwork Procedures) performed in the building that is in impairment.

D. Responsibility

There are three College units that have responsibilities in the operation of the fire alarm system:

- Harper College Police Department (HCPD) is responsible for monitoring and notification of the fire department and required College personnel of fire detection alarms. HCPD will implement requests for the building to be put in Bypass via a Bypass Permit. If a building is impaired, HCPD will conduct a Firewatch and inform the necessary Harper personnel (Vice Pres. Council, Building Administrators and Dept. heads in the impaired building), Fire Department, and Beth Younglove, who will in turn notify the insurance company.
- Physical Plant Utilities Department is responsible for the maintenance, inspection, testing and repair of the fire alarm systems. The permit requestor will determine which devices should be put in bypass, Utilities will help determine if needed. Finally they will notify HCPD, Director of Physical Plant and Manager, Environmental Health & Safety (Mgr. EH&S) if a building fire system is impaired or a planned impairment.
- The Manger Environmental Health & Safety conducts evacuation drills.

E. General Operational Procedures

Testing and Maintenance of Fire Alarm System

All fire alarm systems shall be tested at least annually by designated trained Utilities personnel or by a contractor knowledgeable in the operation and functions of the system. The Utilities department will maintain all testing documentation.

Monitoring, Notification and Bypass Permit Implementation

The fire alarm system shall be continuously monitored by Harper College Police personnel. When the system goes into “fire alarm” (red light alarm) HCPD shall



immediately contact the Fire Department to respond. The fire alarm shall only be silenced or “reset” upon instruction by the Fire Department (with the exception of evacuation drills).

When the fire system goes into “trouble alarm” (yellow light alarm) HCPD shall immediately contact the Utilities Department. Utilities Dept. will then investigate and reset the panel at the troubled building.

HCPD shall implement a Bypass Permit by setting the appropriate controls to the alarm panel, devices that are determined by Utilities Dept.

Evacuation Drills

The Manager, Environmental Health and Safety (Mgr. EH&S) will conduct evacuation drills throughout the year. The Mgr. EH&S will conduct evacuation drills with the assistance of the Palatine Fire Department. The Mgr. EH&S will notify HCPD immediately prior to conducting the evacuation drill and in which buildings the drills will take place. At the conclusion of the drill, the Mgr. EH&S will “reset” the system.

Fire Alarm System Bypass Procedure

The fire alarm system and their components may be required to be put in bypass mode for maintenance/repair, testing, dusty work that cannot be isolated or hot work. Putting the system in bypass shall be planned and limited to an eight and half hour time period (one shift). The Supervisor or Employee of the Department conducting the work shall complete the Bypass Permit. The following procedures shall be followed for bypassing any component of the fire alarm system:

Testing, Maintenance and/or Repair to the Fire Alarm System

Utilities Dept. (or designated contractor) shall conduct maintenance, testing or repair to the fire alarm. If any of these operations may trigger a non-intentional activation of the system, the Supervisor shall complete a Bypass Permit. For testing, maintenance or repair to an entire building fire alarm system the entire building may be put in bypass. If the fire alarm system is **impaired** Utilities shall inform HCPD, Director of Physical Plant and Mgr. of EH&S.

Dusty Work

The department performing the “dust creating” work shall take measures to control large amounts of dust, fumes, vapors, etc. The following steps for isolation should be considered before requesting a Silence Permit:

- Implement engineering controls to limit dust/fumes/vapors, etc. by installing plastic around work area, ventilate work area and/or using wet methods to limit dust creation.
- Department may cover smoke detectors in the vicinity of the work being performed. (use detector covers-preferred, or a paper bag). Supervisor must ensure these are removed at the end of the work.

If work that is being done is creating such dust/fumes, etc. that cannot be controlled by any of the above isolation controls then a Bypass Permit may be requested by the Supervisor or Employee conducting the work.

Hot Work

Operations involving cutting or welding are referred to as Hot Work. All safety procedures for Hot Work Operations are outlined in the Environmental Health and Safety Procedure Manual, Section 23. Hot Work is **not** allowed in buildings where there is a fire alarm or sprinkler system impairment.

24.2 FIRE ALARM SYSTEM BY-PASS PERMIT

FIRE ALARM SYSTEM BYPASS PERMIT “Bypass Permit”		
This Fire Alarm System Bypass Permit is required for any work that is performed inside a building where operations may trigger the alarm for a non-fire event or for service to the fire alarm system. This Bypass Permit only temporarily bypasses (de-activates) <u>the selected detection devices</u> , all other detection systems are in operation.		
Work being done by: <input type="checkbox"/> Employee Name: _____ <input type="checkbox"/> Contractor Name: _____ Phone # _____		
Department:	Work in Building and Room/Area:	
Reason for Bypass: <input type="checkbox"/> TESTING <input type="checkbox"/> Smoke Detectors <input type="checkbox"/> Sprinklers <input type="checkbox"/> Other _____ <input type="checkbox"/> MAINTENANCE / REPAIR Describe: <input type="checkbox"/> DUSTY WORK (<i>isolation controls must be attempted first</i>) <input type="checkbox"/> HOTWORK (<i>also see Hotwork requirements and permit in Section 23</i>) <input type="checkbox"/> Other (describe):		
The following detection devices (smoke detectors) or entire building are to be put in bypass:		
Signed: (Supervisor/Employee of Department Conducting Work):		
Date:	Time Permit Begins:	Time Work is expected to end (<i>max. 8.5 hours</i>):
Section to be completed by Harper College Police Dept. (HCPD)		
Time System put back:	HCPD Call for Service #	
HCPD will automatically reset the Fire Alarm system after this Permit has expired (8.5 hours max.) If additional time is needed another Permit must be completed. Permit is to be posted in HCPD near Fire Alarm Panel.		