isolated from its energy source(s). Stored energy (such as that in springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as repositioning, blocking, bleeding down, etc.

- Lockout/Tagout the energy isolating devices with assigned individual lock(s) and tag(s).
- After ensuring that no personnel are exposed, and as a check on having disconnected the energy sources, operate the push button or other normal operating controls to make certain the equipment will not operate. **CAUTION: Return operating control(s) to neutral or off position after the test.**
- The equipment is now in lockout/tagout.

Restoring Equipment to Normal Operation

- After the servicing is complete and equipment is ready for normal operations, check the area around the equipment to ensure that no one is exposed.
- After all tools have been removed from the equipment, guards have been reinstalled and employees are in the clear, remove all lockout/tagout devices. Operate the energy isolating devices to restore energy to the equipment.

LOTO – Multiple Locks

In the preceding steps, if more than one individual is required to lockout/tagout equipment, each shall place his/her own personal lockout/tagout device on the energy isolating device(s). When an energy isolating device cannot accept multiple locks or tags, a multiple lockout/tagout 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 place in a lockout box or cabinet that allows the use of multiple locks to secure it. Each employee will then use his/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/her lock from the box or cabinet.

Temporary Removal of LOTO Devices

In situations where lockout/tagout devices must be temporarily removed from the energy isolating device and the energized equipment, to test or position the equipment, the following sequence of actions will be followed:

- Remove non-essential items and ensure that equipment components are operationally intact.
- Notify affected employees that lockout/tagout devices have been removed and ensure that all employees have been safely positioned or removed from the area.
- Have employees who applied the lockout/tagout devices remove the lockout/tagout devices.
- Energize and proceed with testing or positioning.
- De-energize all systems and reapply energy control measures in accordance with the lockout/tagout system procedure described above.

Maintenance of Equipment
Where maintenance, repairing, cleaning, servicing, adjusting, or setting up operations cannot be accomplished with the energy source disconnected, such operations may only be performed under the following conditions:

- The operating station (e.g., external control panel) where the machine may be activated must at all times be under the control of a qualified operator.
- All participants must be in clear view of the operator or in positive communication with each other.
- All participants must be beyond the reach of machine elements that may move rapidly and present a hazard.
- Where machine configuration or size requires that the operator leave the control station to install tools, and where there are machine elements that may move rapidly, if activated, such elements must be separately locked out.
- During repair procedures when mechanical components are being adjusted or replaced, the machine shall be de-energized or disconnected from its power source.

Removal of LOTO
A system shall be in place that addresses device removal if the authorized employee who applied the lockout/tagout device is unavailable to remove it. The employee's direct supervisor may only remove the authorized employee's lockout/tagout device(s), after necessity has been established. The procedure shall include at least the following:

- The employee's direct supervisor shall investigate the situation and verify that the authorized employee who applied the device is not at the facility.
- All reasonable efforts shall be made to contact the authorized employee to inform him/her that his/her lockout/tagout device will be removed.
- The authorized employee's direct supervisor is certain that removal of the lockout/tagout device will not endanger employees.
- The authorized employee's direct supervisor will complete the Removal of LOTO Form.
- Prior to resuming work at the facility, the authorized employee shall be notified that his/her lockout/tagout device was removed in his/her absence.

LOTO Inspections
An authorized employee must perform inspections of the energy control procedures annually. The inspections must review lockout/tagout procedures and correct any issues.

Personal Protective Equipment

Purpose

To protect the health and welfare of UAB employees in areas where there may be a risk of injury or exposure to hazardous substances or conditions employees who work in areas where physical hazards or the potential for physical hazards exist.

Scope

Personal Protective Equipment (PPE) include devices for head protection, eye and face protection, protective clothing, hand protection, foot protection, hearing and respiratory protection. Using PPE requires hazard awareness and training on the part of the user. PPE is not a substitute for good engineering or administrative controls or good work practices but should be used in conjunction with these controls.

The use of appropriate personal protective safety equipment applies to all employees, students, visitors and contractors performing tasks or entering areas that require specific PPE.

Definitions

ASTM: American Society Testing Materials is an organization of inclusion offering global access to fully transparent standards development, resulting in the highest technical excellence in standardization.

ANSI: American National Standard Institute is an organization that works to establish national consensus standards regarding occupational safety and protection of the environment.

NIOSH: National Institute for Occupational Safety and Health is the federal agency responsible for conducting research and making recommendations for the prevention of work-related injury and illness.

PPE: Personal protective equipment protects employees from hazards. It includes items such as head protection, eye protection, respiratory protection, protective clothing, protective footwear, barrier or protective lotions, etc.

Eye/Face Protection: Equipment designed to provide protection to the face and eyes during exposure to such hazards as flying particles, molten metal or sparks, liquid chemicals, acids or caustic liquids, or potentially injurious light radiation (i.e., lasers, welding, etc.)

Foot Protection: Equipment designed to provide protection to the feet and toes during exposure to situations with the potential for foot injuries such as falling or rolling objects, chemical or liquid exposures, piercing objects through the sole or uppers, and/or where the employee's feet are exposed to electrical hazards.

Hand Protection: Equipment designed to provide protection to the hands during exposures to potential hazards such as sharp objects, abrasive surfaces, temperature extremes and chemical contact. Hand protection is selected based upon the hazard and performance characteristics of

the gloves.

Head Protection: Equipment designed to provide protection to the head during exposure to potential hazards such as falling objects, striking against low hanging objects, or electrical hazards.

Hearing Protection: Equipment designed to provide protection to an individual's hearing during exposure to high noise levels.

Personal Protective Equipment (PPE): Includes all equipment designed to provide protection to the wearer from potential hazards to the eyes, face, hands, head, feet, ears, and extremities.

Respiratory Protection: Equipment designed to provide protection to the wearer from potential inhalation hazards such as vapors, mists, particulates, and gases.

Responsibilities

Supervisor
Supervisors have the primary responsibility for implementation of the PPE Program in their work area. This involves:

- Providing appropriate PPE and making it available to employees and ensuring they are wearing the equipment
- Identifying the hazards prior to the start of any work and seeking assistance from EHS to evaluate and control the hazards
- If hazards may not be eliminated, then guards and protective equipment should be utilized to ensure the safety of employees.
- Supervising their employees to ensure that the PPE Program elements are followed and that employees properly use and care for PPE
- Notifying EHS when new hazards are introduced or when processes are added or changed

Employees, Students, Visitors, Contractors
The PPE user is responsible for following the requirements of the PPE Program. This involves:

- Wearing PPE as required
- Attending required training
- Caring for, cleaning, storing and maintaining PPE, as required
- Informing the supervisor of the need to repair or replace PPE

EHS
The Office of Environmental Health and Safety is responsible for the development, implementation, and administration of the UAB PPE Program. This involves:

- Determining the type of PPE necessary based on the hazards involved in the job
- Providing safety training and technical assistance to supervisors on the proper use, care and cleaning of approved PPE
- Reviewing, updating and evaluating the overall effectiveness of the PPE Program

- Conducting periodic Job Safety Analysis and Risk Assessments to determine PPE required or other controls necessary to protect the employee

Program Components

All personal protective clothing and equipment will be of safe design and construction for the work to be performed and shall be maintained in a sanitary and reliable condition. Only those items of protective clothing and equipment that meet NIOSH, ANSI or ASTM standards will be procured or accepted for use.

The ANSI standards contain useful reference information regarding the selection and use of PPE. Some of these standards are:

- Eye and Face Protection ANSI Z87.1
- Head Protection ANSI Z89.1
- Foot Protection ANSI Z41.1 and ASTM F-2413-2005
- Hand Protection – the selection must be based on the performance characteristics of the glove in relation to the tasks to be performed.

Identifying the Hazards and Selecting the Proper PPE

In order to be able to choose the proper PPE, the individual must be aware of what hazards exist. This involves obtaining information on the types of hazards present, the toxicity of the materials involved, and what other options are available to control exposure. General information about chemicals may be found in Safety Data Sheets (SDS). The chronic and acute effect of chemicals should also be assessed. The next step would be to implement the control measures necessary to prevent exposure into the operational procedures.

Head Protection

Head injuries are commonly caused by impact from falling or flying objects and falling or walking into hard objects. PPE devices such as hard hats may protect you from objects falling on your head and, in a limited way, from electrical shock or burns. Hard hats should be worn in areas where there is potential for head injuries.

Eye and Face Protection

Eye protection should always be worn where there is potential for injury to the eyes or face from small particles, toxic chemicals, acids or caustic liquids, gases or vapors, bioaerosols, flying objects or particles, large objects, thermal or radiation hazards, and lasers. According to the types of and extent of hazards, different PPE should be worn. PPE for the face and eyes includes devices such as safety glasses, goggles, and face shields. These must always remain clean and free of contaminants. Safety glasses or goggles must always be worn in laboratory areas.

This includes employees, researchers, visitors, contractors and students. To provide protection, supervisors of such areas shall procure a sufficient quantity of goggles or safety glasses which provide the maximum amount of protection possible. If employees wear personal glasses, they shall be provided with a suitable eye protector to wear over them.

Emergency Eyewash Facilities
Emergency eyewash facilities meeting the requirements of ANSI Z358.1 will be provided in all areas where the eyes of any employee may be exposed to hazards. All such emergency stations will be located where they are easily accessible and not blocked in the event of an emergency.

Body Protection
Protective clothing, such as lab coats, should be worn when handling hazardous materials. Tyvek suits and sleeves are also available to prevent the contamination of skin and clothing.

Hand Protection
Selecting the proper gloves is very important since it is our hands that are often used to handle hazardous materials. These materials usually consist of caustic or toxic chemicals, biological substances, electrical sources, or extremely cold or hot objects that may irritate or burn your hands. In addition, traumatic injuries such as cuts, sprains and punctures may also occur. With the wide range of hazards, there also exists a wide range of gloves that may be used as PPE. The first consideration in the selection of gloves for use against chemicals is to determine, if possible, the exact nature of the substance to be encountered. Read instructions and warnings on chemical container labels and SDS before working with any chemical. Recommended glove types are often listed in the section for personal protective equipment.

Foot Protection
Injuries that may occur when the proper footwear is not worn are chemical and heat burns from spills and splashes of acids and caustics, compression injuries, electrical shocks, and slipping. Wearing the proper footwear is, therefore, very important when working in areas where physical and chemical hazards are present. Close-toed shoes must always be worn in laboratory areas where chemicals are present.

Hearing Protection
Earplugs are should be made available in areas where the noise exposure to high levels may result in hearing loss. PPE should be worn when the noise level is 85 decibels or greater averaged over an 8-hour period of time.

Respiratory Protection
Respirators are used to prevent the exposure to air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors. All respirator usage, which includes disposable respirators, air purifying respirators, and air supplied respirators, require annual fit testing and training prior to use.

Scaffolding Guidelines

UAB employees must follow General Industry standards when working with scaffolds. All scaffolds must be inspected daily by a qualified person before any work begins.

Fixed Scaffolds (Work Platforms)

- The footing or anchorage for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose brick, or concrete blocks shall not be used to support scaffolds or planks.
- Scaffolds and their components shall be capable of supporting, without failure, at least four times the maximum intended load.
- Scaffolds shall be maintained in safe condition. Scaffolds shall not be altered or moved horizontally while they are in use or occupied.
- Any scaffold damaged or weakened from any cause shall be immediately repaired and shall not be used until repairs have been completed.
- Scaffolds shall not be loaded in excess of the working load for which they are intended.
- Guardrails not less than 2x4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1x4-inch lumber or equivalent, and toe-boards shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toe-boards shall be a minimum of 4 inches in height.

Mobile Work Platforms

- All scaffold work levels 10 feet or higher above the ground or floor shall have a standard (4-inch nominal) toe board.
- All work levels 10 feet or higher above the ground or floor shall have a guardrail of 2x4-inch nominal or the equivalent installed no less than 36 inches or more than 42 inches high, with a mid- rail, when required, of 1x4-inch nominal lumber or equivalent.
- A climbing ladder or stairway shall be provided for proper access and egress and shall be affixed or built into the scaffold and so located that its use will not tend to tip the scaffold. A landing platform shall be provided at intervals not to exceed 12 feet. Never climb a ladder with tools or materials; instead attach to the body in an appropriate support or pull up with a rope.
- Employees shall not work on scaffolds during storms or high winds.
- Employees shall not work on scaffolds which are covered with ice or snow, unless all ice or snow is removed, and planking sanded to prevent slipping.
- Tools, materials, and debris shall not be allowed to accumulate in quantities to cause a hazard.

Slips, Trips, and Falls

To reduce injuries caused by slips, trips, and falls, it is important to minimize the hazards that cause them.

- Immediately clean up and place warning signs in wet floor areas.
- Eliminate uneven floors, chords across walkways, and clutter in walking areas.
- Avoid undue speed and maintain an unobstructed view while carrying a bulky load.
- Use handrails when going up or down the stairs.
- Use ladders correctly by following ladder safety measures such as using only on even surfaces and using the 3-point rule while ascending and descending.
- Assure good lighting provided in all hallways and stairwells and report to maintenance if you see a problem.
- Use caution on icy walkways and loading docks. Contact maintenance to apply de-icing solutions.
- Report all incidents to you supervisor immediately.

Ergonomics

Preventing injuries through ergonomics is an applied science concerned with designing and arranging things people use so that the people and things interact most efficiently and safely.

Office Setting Injury Prevention:

- Avoid a bent neck, shoulders raised or bent, and awkward postures.
- Keyboard should be placed directly in front of the monitor.
- Computer monitor should be 18-20 inches away from you and at eye level.
- Take frequent breaks and avoid prolong repetitive postures and motions.
- Elbows should be positioned so hands are at a 90-degree angle to the desktop.

General Ergonomics Injury Prevention:

- Do not text and walk.
- Never obstruct your vision while working or walking.
- Select proper footwear for the job.
- Do not jerk to lift or move a load.
- Use equipment or ask for help when moving heavy or awkward loads.
- Avoid prolonged awkward postures and handholds.
- Use the correct tools for the job.