VI. Personal Protection Program

This section applies to employees and students on campus construed to be in need of personal protective equipment by virtue of their exposure to hazards in the working, teaching, or research environment. Protective equipment shall be used and maintained in sanitary and reliable condition. Under no circumstances shall a person knowingly be subjected to a hazardous condition without appropriate personal protective equipment. Persons who are exposed to hazards requiring personal protective equipment shall be properly instructed in the use of such equipment by the individual in charge of the activity or his/her designee. It is the responsibility of the individual in charge of the activity to assure that safety practices are adhered to. If those individuals required to wear personal protective equipment fail to do so, they will be subject to disciplinary action.

A. Eye Protection

1. General

- a. Persons working in or studying occupations such as painting, carpentry, construction, labor, landscape, general maintenance, metal trades, chemistry, other sciences and engineering, or any work/study activity which involves hazards such as flying objects, dust and/or vapors, hot metals, chemicals, or light radiation shall wear approved safety eyewear/goggles at all times while exposed.
- b. Custodial workers shall wear approved safety eyewear/goggles when cleaning bathroom appliances or mopping floors with caustic or abrasive cleaners.
- c. Management level employees, students, or visitors who make occasional visits to machine, welding, and carpentry shops, boiler rooms, equipment rooms, power houses, construction areas, chemistry labs, or other areas in which eye injury is a possibility shall wear approved eyewear.

2. Prescription Lens Wearers

If required to wear eye protection, such persons shall wear an approved face shield, goggles that fit over glasses, prescription glasses with protective optical lenses fitted with side shields, or goggles that incorporate prescription lenses.

3. Contact Lens Wearers

Contact lenses shall never be considered as a substitute for eye protection; eye protection shall be worn over them.

4. Approval and Selection:

a. Eye protection shall meet the ANSI Z87.1-1989 standard and the eyewear shall indicate such on the lens or the frame.

- b. Visitors to hazardous areas shall be provided protective eyewear meeting ANSI Z87.1 protection factors for visitor's eyewear.
- c. Selection chart for eye and face protectors:

This selection chart offers general recommendations only. Final selection of eye and face protective devices is the responsibility of management and safety specialists. (For laser protection, refer to American National Standard for Safe Use of Lasers, ANSI Z136.1-1976.)

Selection Chart for Eye and Face Protectors For Use In Industry, Schools, And Colleges

- 1. Goggles–Flexible fitting, regular ventilation.
- 2. Goggles–Flexible fitting, hooded ventilation.
- 3. Goggles–Cushioned fitting, rigid body.
- 4. Spectacles*—Without side shields.
- 5. Spectacles–Eyecup type side shields.
- 6. Spectacles—Semi-/Flat-fold side shields.
- 7. Welding Goggles–Eyecup type, tinted lenses (illustrated).
- 7A. Chipping Goggles–Eyecup type, clear safety lenses (not illustrated).
- 8. Welding Goggles–Cover spec type, tinted lenses (illustrated).
- 8A. Chipping Goggles—Cover spec type, clear safety lenses (not illustrated).
- 9. Welding Goggles—Cover spec type, tinted plate lens.
- 10. Face Shield–Plastic or mesh window (see caution note).
- 11. Welding Helmet*

*Non-side shield spectacles are available for limited hazard use requiring only frontal protection.

Operation	Hazards	Protection
Acetylene-Burning	Sparks, harmful rays,	7,8,9
Acetylene-Cutting	molten metal,	
Acetylene-Welding		
	flying particles	
Chemical Handling	Splash, acid burns,	2 (for severe exposure, add 10)
	fumes	_
Chipping	Flying particles	1,3,4,5,6,7A,8A
Electric (Arc) – Welding	Sparks, intense rays,	11 (in combination with 4,5,6 in tinted
	molten metal	lenses, advisable)
Furnace Operations	Glare, heat, molten	7,8,9 (for severe exposure, add 10)
	metal	

Grinding-Light	Flying particles	1,3,5,6 (for severe exposure, add 10)
Grinding-Heavy	Flying particles	1,3,7A,8A (for severe exposure, add 10)
Laboratory	Chemical splash, glass	2 (10 when in combination with 5,6)
	breakage	
Machining	Flying particles	1,3,5,6 (for severe exposure, add 10)
Molten Metals	Heat, glare, sparks,	7,8 (10 in combination with 5,6, in tinted
		lenses)
Spot Welding	Flying particles	1,3,4,5,6 (tinted sparks lenses advisable; for
		severe exposure add 10)

Caution:

- * Face shields alone do not provide adequate protection.
- * Plastic lenses are advised for protection against molten metal splash.
- * Contact lenses, of themselves, do not provide eye protection in the industrial sense and shall not be worn in a hazardous environment without appropriate covering safety eyewear.

5. Inspection And Maintenance

All eye and face protection shall be kept clean and inspected daily before each use. Badly scratched or damaged items are to be replaced immediately.

6. Other

It is recommended that all employees required to wear eye and face protection shall have their own and be required to inspect and maintain them in accordance with this section.

B. Hearing Protection

1. Employees/Students Covered

Hearing protection shall be worn by employees/students when noise exposure is above that of the 90dB when measured on the A-scale of the standard sound level meter at slow response. An employees/students may also be required to wear hearing protection if hearing loss is demonstrated during audiometric testing. Audiometric testing is required at 85dBA of noise exposure and the employees/students is placed in the hearing conservation program.

2. Approval and Selection

- a. Personal hearing protection devices shall meet ANSI 53.19.
- b. Selection of hearing protection shall take into consideration durability, ease of fit, noise calculations in area, and length of time to be worn.
- c. There are many types of disposable and permanent hearing protection. Listed below are three:
 - i. *Earmuffs*: fluid or foam-filled cushions connected by a plastic or metal band that fits over the head. They reduce noise levels by 35-40dB depending on type and fit. In order for them to be effective, a perfect seal must be formed. Glasses, long side burns, and facial movements can reduce protection.

- ii. *Ear Plugs*: the most commonly used ear protection device. They come in many different shapes, sizes, and materials. Ear plugs can be purchased as disposables, preformed, or molded (professionally fitted). They reduce noise levels by 25-30dB depending on type and fit. Cotton is ineffective as ear plugs.
- iii. *Ear Caps*: a cross between ear muffs and ear plugs—ear plugs connected to a plastic (usually) band which can be worn under the chin, over the top of the head, or behind the neck. They reduce noise levels by 25-35dB depending on type and fit.

NOTE: Combinations or ear plugs and ear muffs can reduce noise level be an additional 3-5dB depending on type and fit.

3. Fitting

Preformed ear plugs have to be professionally fitted. All others are fitted according to need in accordance with LSU's hearing conservation and evaluation program.

4. Inspection and Maintenance

All ear protection, if not disposable, shall be inspected and cleaned before each use. All damaged ear protection shall be discarded and replaced. No unauthorized modifications shall be allowed.

5. Other

Noise measurements shall be performed by the Office of Occupational and Environmental Safety personnel. Noise studies shall be authorized by the Office of Occupational and Environmental Safety.

C. Hand Protection

1. Employees/Students Covered

Hand protection shall be worn by employees when handling hot work, chemicals, electrical, material handling of rough and/or sharp items, doing landscaping work, welding, and "wherever it is necessary by reason of hazards of processes of environmental, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment." (OSHA 1910 Standards)

Hand protection shall not be worn while working on moving machinery such as drill saws, grinders, or other rotating and moving equipment that might catch the hand protection and pull the worker's hand into a hazardous area.

2. Approval and Selection

Hand protection used will meet the criteria for its particular use. Consult with EHS for assistance in selection as required. The EHS web site contains chemical resistance charts for glove selection. Other factors such as durability, dexterity, and frequency and ease of donning and removing gloves are also important factors in glove selection.

3. Fitting

Gloves shall be selected to fit comfortably and snugly.

4. Inspection and Maintenance

All hand protection shall be kept clean and inspected daily before each use. Badly worn or damaged items are to be replaced.

5. Glove Materials

Note: For Glove selection, consult the Occupational and Environmental Safety Web Page or contact EHS.

To assure resistance to a particular chemical, the user should rely upon chemical permeation and resistance data conducted by the manufacturer. Manufacturers may show different data for the same glove material.

a. Liquid Proof Styles

- i. Butyl (cement*) Highest resistance to permeation by most gases and water vapor.
- ii. *Viton (cement*)* Exceptional performance when subjected to chlorinated and aromatic solvents, coupled with excellent resistance to permeation by many vapors.
- iii. *Nitrile* (*latex**) Superior puncture and abrasion resistance. Recommended as a general duty glove. Excellent resistance to the degrading effects of fats, petroleum products, and a wide array of chemicals.
- iv. *Natural Rubber* Excellent resistance to the degrading (cement*) effects of alcohols and caustics. Ideal for use in sand blasting.
- v. *PVC Coated* Excellent abrasion resistance in a liquid-proof glove. Also provides cushioning.
- * Cement and Latex refer to two basic manufacturing processes of unsupported liquid proof gloves. As a general rule, cement dip gloves exhibit greater resistance to liquid and vapor permeation than do Latex dipped gloves. Therefore, where a permeation barrier is required, a cement dip glove shall be selected.

b. General Purpose: Fabrics and Coatings

- i. Worknit® Combines the toughness of a nitrile coating with the softness and stretchy comfort of jersey.
- ii. Worknit HD™ Developed and designed to replace leather and/or heavy cotton gloves, the HD fabric has a heavier cotton liner than the regular Worknit. This glove is best used where a tough job requires a product which provides protection, excellent wear, comfort, and value.
- Coated Machine Knits
 Unique, economical answer to the general purpose glove. Offers comfort and long wear. Four wearing surfaces instead of two. Superior grip and abrasion resistance.
- 1) Grip-N®, Grip-N® Hot Mill, Double™ Grip-N® (1.)Reversibility (2.)N-tread PVC coating.
- 2) Clean Grip™ (1.)Reversible (2.)Large. Soft PVC Dots

- iv. Impregnated Wovens and Jerseys
- 1) Newtex Woven cloth for strength. Coating for abrasion resistance.
- 2) PVC Dotted Canton and Jersey. The original coated glove. Cool, comfortable cotton, permanently "dotted" for longer wear and better grip.
- v. Uncoated Knit Fabrics Machine Knit (string glove). 100% cotton. They are cool, comfortable, and the lowest-priced glove on the market.
- vi. General Purpose: Leather
- 1) Side Split Leather Superior combination of strength, thickness and suppleness in split cowhide leather. A minimum of flaws, scars, and weaknesses, provides longer wear and comfort.
- 2) Shoulder Split Leather Provides cushioning and abrasion resistance in a more economical grade of leather.
- 3) *Grain Leather* Better flexibility, finger dexterity and fit than split leather. Generally, more comfortable, but less durable than split leather.

D. Respiratory Protection Program

1. General Program Requirements

See Industrial Hygiene Section and appendix for details of the program.

2. Rules for Respirator Program

- a. If a respirator is required by an OSHA standard or due to overexposure to a contaminant in the workplace, all of the requirements of the respirator program must be met, including medical evaluation, fit testing, maintenance, and program management.
- b. If a respirator is required by the organization (i.e., director, manager, supervisor, principle investigator), all of the requirements of the respirator program must be met, including medical evaluation, fit testing, maintenance, and program management.
- c. If respirator use is voluntary, EHS recommends having a medical evaluation, fit testing, and maintenance. Dust masks do not require a medical evaluation or fit testing.

 Note: Voluntary respirator use applies if the employees are not exposed to hazardous agents above the permissible exposure limits, they are not emergency responders, or they are not required by the organization. Voluntary use of respirators is encouraged by Louisiana State University to prevent inhalation of small amounts of potentially harmful agents that are not considered to be at hazardous levels as defined by OSHA.
- d. If a respirator is required use as a member of an emergency team, all of the requirements of the respirator program must be met, including medical evaluation, fit testing, maintenance, and program management.

3. Fit Testing

- a. Before using a respirator an employee must be fit tested with the same make, model, style, and size of respirator that they will be wearing.
- b. A qualitative fit test (QLFT) or quantitative fit test (QNFT) according to Appendix A of the attachment must be used.
- c. Air supplied or powered air purifying (PAPR) respirators must also use the fit test techniques of Appendix A of the attachment by adapting the facepieces to negative air respirators or using an identical negative air respirator as a surrogate.

4. Rules for Maintenance, Care and Use of Respirators

(Does not apply to dust masks)

- a. Change filter cartridges or dispose of respirator in accordance with breakthrough times recommended by the manufacturer.
- b. Clean facepieces periodically to maintain hygienic conditions using the manufacturer's recommended cleaning product (or isopropyl alcohol, or suitable disinfectant). Emergency use respirators, respirators used by more than one person, and fit test respirators are to be cleaned after each use.
- c. Perform field fit check before each use (see appendix for procedure).
- d. Facial hair and glasses shall not interfere with respirator fit.
- e. Inspect respirators before each use and replace if defective.
- f. Store respirators to prevent contamination, moisture, or damage.

5. Breathing Air Quality and Use

- a. Compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration shall comply with the following specifications:
 - i. Compressed and liquid oxygen shall meet the United States Pharmacopoeia requirements for medical or breathing oxygen; and
 - ii. Compressed breathing air shall meet at least the requirements for Type 1-Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:
 - 1) Oxygen content (v/v) of 19.5-23.5%;
 - 2) Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;
 - 3) Carbon monoxide (CO) content of 10 ppm or less;
 - 4) Carbon dioxide content of 1,000 ppm or less; and
 - 5) Lack of noticeable odor.
- b. Cylinders used to supply breathing air to respirators shall meet the following requirements:
 - i. Cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 173 and part 178);

- ii. Cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for Type 1–Grade D breathing air; and
- iii. The moisture content in the cylinder does not exceed a dew point of '50 °F ('45.6 °C) at 1 atmosphere pressure.
- c. Do not use oil-lubricated compressors.
- d. Breathing gas containers marked in accordance with the NIOSH respirator certification standard, 42 CFR part 84, shall be used.

6. Identification of Filters, Cartridges, And Canisters

All filters, cartridges and canisters used in the workplace shall be labeled and color coded with the NIOSH approval label and that the label is not removed and remains legible.

7. <u>Training and Information</u>

Effective training must be provided to employees who are required to use respirators. The training must be comprehensive, understandable, and recur annually, and more often if necessary. Employees who wear respirators when not required by this section or by the employer to do so must be provided the basic information on respirators in Appendix D of the attachment. Consult the appendix for training procedures.

E. Fall Protection

1. Employees/Students Covered

Fall protection shall be utilized by those employees/students for the specific purpose of securing, suspending, or retrieving the employee/student in or from a hazardous work area, and/or when work exposes them to the risk of falling more than 6' whether outdoors or inside buildings.

2. Approval and Selection

Fall protection and devices and equipment shall meet ANSI A 10.14.

Selection of fall protection shall be based on the attached, "Classification of Safety Belts, Harnesses, and Lanyards."

3. Fitting

The appropriate safety belt shall be chosen for the hazard. It shall be securely buckled and worn tightly enough to prevent any possibility of the wearer slipping out.

4. Inspection and Maintenance

Safety belts and associated equipment shall be inspected before each use. Every one to three months they shall be inspected by a trained inspector. Cut, worn, or damaged belts, lifelines, lanyards, etc., shall be discarded and replaced. Safety belts in service shall not be tested for maximum impact loading.

Note: After an accidental freefall, the safety belt and lanyard shall be discarded.

5. Classification of Safety Belts and Harnesses

Class I: Body belt (work belts), used to restrain a person in a hazardous work position and to reduce the probability of falls and to avert falls from bucket trucks.

Class II: Chest harness, used where there are only limited fall hazards (no vertical free-fall hazard) and for retrieval purposes, such as removal of a person from a tank, bin, or other enclosed place.

Class III: Body harness, used to arrest the most severe free-falls. This harness is ideal for workers on elevated sites. During a fall, it distributes the fall impact over the body.

Class IV: Suspension belts, independent work supports used to suspend or support the worker.

Lifeline: A horizontal line between two fixed anchorages.

Support capacity: 5400 lbs.

Line diameter: ½ inch.

Personal Lifeline: This system is usually a rope system that provides flexibility for worker freedom of movement, yet will arrest a fall and help absorb the shock. These systems always have some type of belt or harness that is worn around the waist to which a lanyard or rope-grabbing device is attached.

Lanyard: A short piece of flexible line used to secure wearer of safety belt to a lifeline or dropline, or fixed anchorage, such as on the boom of a bucket truck.

Support capacity: 5400 lbs.

F. Foot Protection

1. Employees/Students Covered

For all non-office personnel, "Footwear such as sandals, open-toed shoes, platforms, high heels, cloth-bodied tennis shoes, or sneakers is not considered safe and is prohibited for use as a good work shoe. Well-built safety shoes, leather-bodied shoes, or boots in good condition with low heels and hard soles are to be used." (Physical Plant Operations Manual)

2. Approval And Selection

Foot protection used shall meet ANSI Z41.1 "Men's Safety-Toe Footwear."

Foot Protection Classification and Protection Factors

Classification of Safety Shoes

a. Safety-toe Shoes: Steel toes and metal reinforced sole.

Usage: Areas where heavy, protruding on falling objects presents a threat.

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b. Conductive Shoes: Reduces the possibility of generating a spark.

Usage: Areas where fire and explosive hazards exist.

c. Foundry Shoes: Contains no fasteners and is easily removed.

Usage: Areas where exposure to splashes of molten metal is likely.

d. Explosive Operation Shoes: A shoe with non-conductive and grounding properties.

Usage: Areas where explosive compounds are present when cleaning tanks with volatile hydrocarbons.

e. Electrical Hazard Shoes: A shoe which minimizes the hazard of conducting electricity (no metal in shoes).

Usage: Areas where electrical hazards exist.

3. Inspection and Maintenance

All foot protection shall be kept reasonably clean and in good repair. Shoes shall be repaired or replaced periodically.

G. Head Protection

1. Employees/Students Covered

Employees/students in areas such as visiting construction sites, tree trimmers, and any work where a potential for head hazard may exist.

2. Approval and Selection

Head protection used shall bear the ANSI Z89.1 or Z89.2 approval, manufacturer's name, and ANSI class designation (A, B, C, or D). Employees shall only be allowed to purchase or receive them through an authorized department representative to insure compliance. Refer to the attached "Selection Chart for Head Protection for University Employees" to determine appropriate head protection.

3. Fitting

Each employee shall be individually fitted. The hard hat shall fit firmly but comfortably on the employee's head.

4. Inspection and Maintenance

- a. Painting: If the hard hat is to be painted, the manufacturer shall be contacted to see if the paint will affect the properties of the hat.
- b. Cleaning: Hard hats shall be washed every thirty days. If worn by more than one employee, it shall be washed daily.
- c. Inspection: Before each wearing of the hard hat, it shall be checked for wear and damages, especially the suspension system.

d. Other: Hard hats shall not be stored or carried on the rear window shelf of a vehicle. Sunlight and extreme heat can affect the degree of protection offered. Also, the hard hat can become a projectile in an accident.

5. <u>Selection Chart for Head Protection for University Employees</u>

- a. Hard Hat: A rigid head gear of varying materials used to protect the worker's head from impact, penetration, electrical shock, or a combination of these.
- b. Composition: Special plastics, fiberglass and plastics combination, cloth and resin, and aluminum alloy.

c. Types:

- i. Type 1: Helmet (hard hat), full brim. Allows for complete protection of head, face, and back of neck.
- ii. Type 2: Helmet (hard hat), brimless with beak. This type is most commonly used and can accommodate various types of face shields and ear protection.
- d. Classes: There are four different voltage classes of head protection. University personnel covered under this section shall only be allowed to wear class A and B.
 - i. Class A: Limited voltage protection. Used by employees or students in general service (non-electrical) occupations. i.e., construction, landscape, etc.
 - ii. Class B: High voltage protection. Used by employees in electrical occupations, i.e., electricians.
- iii. Class C: Metal helmets. Under no circumstances shall metal helmets be used by University employees or students.
- iv. Class D: Firefighters' helmet.

e. Other Forms of Protective Head Gear:

- i. Bump Hats: Shall not be used unless approved by the Office of Occupational and Environmental Safety.
- ii. Hair Protection: All employees/students with long hair or beards who work around chains, belts, or other machines with moving parts shall be required to wear protective hair coverings. Hair nets, bandannas, and turbans shall not be considered satisfactory. Contact local vendors for information on the type of protective hair coverings available. Those who work around sparks, hot metals, flames, etc., shall use flame-resistant protective hair coverings.

H. Protective and Preventive Clothing

1. Employee/Students Covered

Protective clothing shall be worn by employees/students when the potential of an employee/student being exposed or coming in contact with harmful substance is evident. i.e., chemicals, high heat (radiant), dust, open flame, etc.

2. Approval and Selection

There are many different standards for approval of protective clothing (ANSI, ASTM, etc.). Protective clothing shall be selected for specified hazard, degree of protection, comfort, and ease of use.

Once the specific or multi-hazards have been identified, contact a reputable vendor or Occupational and Environmental Safety personnel for recommendation of proper protective clothing and/or equipment needed.

3. Fitting

Protective clothing shall fit the wearer comfortably and shall not be too loose or baggy.

4. Inspection and Maintenance

Protective clothing shall be routinely cleaned unless disposable. Disposable clothing shall be disposed of after use. Damaged, torn, ripped, etc., clothing shall be replaced before use.

5. Preventive Clothing

Employees in occupations which expose them to arcs, flames, and explosions shall wear clothes which will not melt, drip, or burn in the presence of one of these hazards. Heavy cotton of flame resistant fabrics shall be worn.

I. Emergency Showers and Eye Wash Stations

Since it has been conclusively proven that immediate washing of the skin and eye with a generous amount of water is the most effective first aid treatment for chemical burns, all chemistry laboratories and areas where faculty, staff, students, or visitors are exposed to harmful chemicals shall be provided with safety showers and eyewash fountains. These facilities shall be conveniently located and tested frequently, readily available, operable, and known to persons concerned.

The valve handle of safety showers and eyewash fountains shall be rigidly fixed and plainly labeled. The valve shall open readily in either direction and remain open until intentionally closed. Water flow pressure shall be sufficient to drench the subject rapidly or gently flow in the case of eyewash fountains. The shower and eyewash fountain area shall be kept clear of obstructions. Water of drinking purity only shall be used in safety showers and eyewash fountains. The showers and eyewash stations shall be in the immediate vicinity. Eyewash stations should be located close to the safety shower so that the eyes can be washed while the body is showered if necessary.

Emergency eyewash fountains shall deliver a gentle flow of clean, aerated water. A hand-held eyewash spray with a five-foot hose is more adaptable to unusual situations including head and body splashes, but shall not be located where it can be contaminated by waste materials. It shall be understood by all that eye protection is infinitely more important than eye washes.

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For chemical splashes, very complete irrigation is indicated. (A 15minute flush is recommended.) Immediately flush the eye with copious amount of water under gentle pressure, checking for and removing contact lenses at once. An eyewash fountain shall be used if available. Forcibly hold the eye open to wash thoroughly behind the eyelids. In the absence of an eyewash fountain, the injured shall be placed on his back and water gently poured into the eye. The injured eye shall be held open. The injured shall be given prompt medical attention, regardless of the severity of the injury. Keep the eye immobilized with clean, wet, cold pads while transporting the injured to medical attention.

Neutralizing agents shall not be used for chemical burns to the eye. Experiments have indicated that this type of treatment is likely to increase the eye damage.

The emergency shower and eyewash fountains shall be tested on a regular basis and a record kept of such tests. The tests shall concern the operation of the unit to determine sufficient water flow and valve operation. The physical condition of the unit shall be noted and whether the unit is kept clear of obstructions.

Portable Eye Wash Stations

Periodically inspect each station to make sure it is properly filled and ready to use. Check to see if the unit is full. Change the water once a month with water of drinking purity. Test the unit's operation monthly.

Also, be sure the unit is always clearly visible and there are no obstructions to interfere with its use.