2019

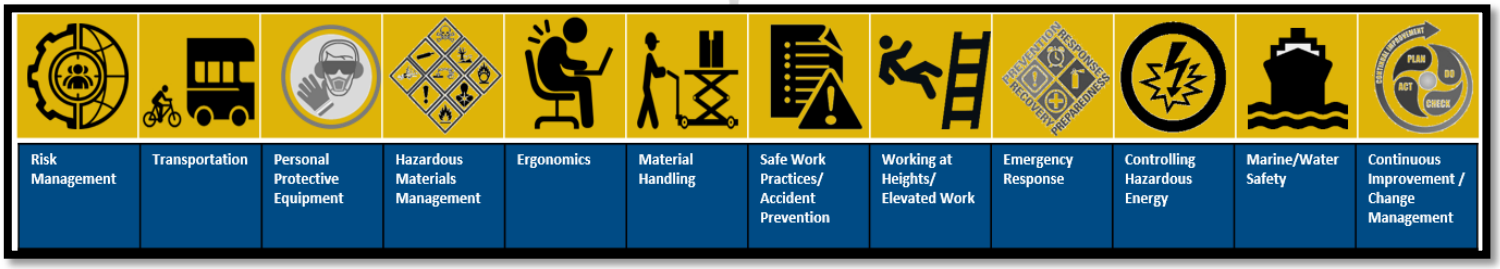
CAL MARITIME

Personal Protective Equipment Program

INJURY ILLNESS PREVENTION PROGRAM

*This sheet should be completed each time the **Personal Protective Equipment Program** is reviewed and/or modified. The Director of Safety and Risk Management is responsible for the review and update this document annually or more frequently as determined or needed per CSU Chancellor's Executive Order 1039 Occupational Health and Safety Policy, 1069 Risk Management as well as Cal Maritime A&F Policy 09-004 IIPP.*

Version	Date Approved	Author	Revision Notes:
1.0	04/01/2018	Marianne Spotorno, CSP Dir. Safety & Risk Management	New Program Document
2.0	08/01/2019	Marianne Spotorno, CSP Dir. Safety & Risk Management	• Campus Emergency Response update. • TSGB component update



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1.0 Purpose & Scope

The purpose of the Injury Illness Prevention Program (IIPP) is to outline Cal Maritime's environmental health and safety requirements, expectations, and responsibilities in order to achieve effective campus safety performance through Integrated Safety Management (ISM). The **Personal Protective Equipment (PPE) Program** is a subject specific component the supports the overall University IIPP.

The Personal Protection Equipment (PPE) Program is to establish a comprehensive approach toward controlling potential accidental employee injuries on campus and to reduce/prevent exposure to specified physical hazards when/where needed. The requirements of this document apply to all employees when working in conditions requiring personal protective equipment. This program does not apply to workplace operations regulated by Cal/OSHA's High Voltage Electrical Safety Orders or to their Construction Safety Orders. Employees working with energized electrical equipment are covered specifically under the University's Energized Electrical Work" and "Energized Work Procedures" programs and are exempted from this program for those related exposures.

This Manual applies to all Cal Maritime operations, maintenance and construction activities under the supervision of Cal Maritime personnel. For activities associated with the Training Ship Golden Bear (TSGB) refer to the Vessel Operating Manual (VOM) and/or Shoreside Administrative Manual (SAM). The TSGB is a subject specific component that supports the overall University IIPP.

1.1 Regulatory Standards Reference

The California State Department of Industrial Relations, Division of Occupational Safety & Health, CCR Title 8 Regulations references the following recommendations regarding personal protective equipment.

- Title 8, California Code of Regulations, General Industry Safety Orders
  §3380 Personal Protective Devices
  §3381 Head Protection
- §3382 Eye & Face Protection
- §3383 Body Protection
- §3384 Hand Protection
- §3385 Foot Protection
- §5096 Hearing Protection
- §5144 Respiratory Protection
- 8 CCR 5194 Hazard Communication: (http://www.dir.ca.gov/title8/5194.html)
- 8 CCR 3203 IIPP: (http://www.dir.ca.gov/title8/3203.html)
- 8 CCR 5209: Listed Carcinogens (http://www.dir.ca.gov/title8/5209.html)

1.2 CSU-System & Cal Maritime Specific Reference

- CSU Chancellor's Executive Order 1039.

1.3 Other Resources

- American National Standards Institute
- Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components
- Practice for Occupational and Educational Eye and Face Protection
- Industrial Head Protection
- Ansell: Cut Protection Product Comparison & Selection
- Hand Protection & Loss Control Analysis
- DuPont: Cut Test Methods
- Kevlar® Cut Protection Performance Test (CPPT)
- Understanding Cut Protection Performance

2.0 Administrative Duties & Responsibilities

It is the policy of the Cal Maritime to maintain a safe and healthy work environment for each employee (including student and contract employees), and to comply with all applicable occupational health and safety regulations. This Injury and Illness Prevention Program (IIPP) is intended to establish a framework for identifying and correcting workplace hazards within the department, while addressing legal requirements for a formal, written IIPP.

To assist Cal Maritime in providing a safe, compliant, environmentally sound, and more sustainable operation, each department or operational unit is expected to review, understand, and follow the guidance provided in the Injury Illness Prevention Program components and the and the function of the integrated campus safety management system (ICSMS) as related to operations under their control.

In a proactive behavior based environmental health and safety model that entire campus community participation reflects a process that embraces the ability to;

- Eliminate adverse conditions which may result in injury or illness,
- Recommend the establishment of programs to raise safety consciousness in the community, and
- Achieve and maintain a beneficial relationship through continuing communication on issues relating to environmental health and occupational safety.

2.1 Employees (Including Student workers)

It is the responsibility of all faculty and staff to proactively participate and subsequently comply with all applicable health and safety regulations, Cal Maritime policies, and established safe work practices. This includes, but is not limited to:

- Observing health and safety-related signs, posters, warning signals and directions.
- Learning about the potential hazards of assigned tasks and work areas.
- Taking part in appropriate health and safety training.
- Following all safe operating procedures and precautions.
- Participating in workplace safety inspections
- Using proper personal protective equipment.
- Inform coworkers and supervisors of defective equipment and other workplace hazards without fear of reprisal.
- Reviewing the building emergency plan and assembly area.
- Reporting unsafe conditions immediately to a supervisor, and stopping work if an imminent hazard is presented.

2.2 Department of Safety and Risk Management (SRM)

The Director of Safety and Risk Management (SRM), as delegated by the University President, is responsible for the implementation and administrative management for Cal Maritime's Injury Illness Prevention Program (IIPP) that meets the requirements of California Code of Regulations (CCR), Title 8, section 3203) as well as other applicable California and Federal Occupational Safety and Health (Cal-OSHA) requirements.
Further responsibilities are outlined below:

- Provide advice and guidance to all university personnel concerning IIPP compliance requirements;
- Provide centralized monitoring of campus activities related to implementation of campus IIPP;
- Ensure scheduled periodic safety inspections are performed in compliance with regulatory requirements and assist management staff in identifying unsafe or unhealthful conditions;
- Ensure safety and health training programs comply with regulatory requirements and university policy;
- Oversee the maintenance of safety and health records consistent with the requirements of this document and regulatory mandates;
- Ensure program audits, both scheduled and as required by a process, equipment or personnel change, or by a safety program mandate, are performed;

- Interpret existing or pending safety and health legislation and recommend appropriate compliance strategies to university personnel;
- Maintain centralized environmental and employee monitoring records, allowing employee access as directed by law.
- Conduct at least an annual review of this document and make the current revision available on the SRM web site.

2.3 Deans, Directors, Department or Operating Unit Management

Campus Department or Operating Unit Head leadership have an integral campus role and shall have a thorough understanding of Injury Illness Prevention Program components and the function of the integrated campus safety management system (ICSMS) as related to operations under their control.

- The Department Head has primary authority and responsibility to ensure the health and safety of the department's faculty, staff and students through the implementation of the Injury Illness Prevention Program components. This is accomplished by communicating the Cal Maritime's campus emphasis on health and safety, analyzing work procedures for hazard identification and correction, ensuring regular workplace inspections, providing health and safety training, and encouraging prompt employee reporting of health and safety concerns without fear of reprisal.
- Specific areas include employee and student (both student employees and students in academic programs) education and training, identification and correction of unsafe conditions, and record keeping. It is recognized that a substantial amount of responsibility falls at this level.
- Colleges and Departments are encouraged to designate an individual as the College or department safety coordinator, to assist with specific operational environmental health and safety process management components.

2.4 Supervisors and Principal Investigators

Supervisors play a key role in the implementation of the Cal Maritime's Injury Illness Prevention Program components. Supervisors may be Management, Senior Research Associates, Department Chairs, Principal Investigators, or others who oversee a project and/or staff. They are responsible for but not limited to:

- Communicating to their staff and students about Cal Maritime campus's emphasis on health and safety.
- Ensuring periodic, documented inspection of workspaces under their authority.
- Promptly correcting identified hazards.
- Modeling and enforcing safe and healthful work practices.
- Providing appropriate safety training and personal protective equipment.
- Implementing measures to eliminate or control workplace hazards.
- Stopping any employee's work that poses an imminent hazard to either the employee or any other individual.
- Encouraging employees to report health and safety issues without fear of reprisal.

2.5 Academic Programming Faculty and Advisors

It is the responsibility of Faculty, Academic Programming Advisors other Cal Maritime related activities and student clubs to:

- Develop procedures to ensure effective compliance and support of the Injury and Illness Prevention Program components as it relates to operations under their control. Specific areas of responsibility include student education and training, identification and correction of unsafe conditions, and incident reporting.
- Develop and maintain written classroom, laboratory, and activity procedures which conform to regulatory, campus and departmental guidelines.
- Instruct students in the recognition, avoidance, and response to unsafe conditions, including hazards associated with non-routine tasks and emergency operations
- Permit only those persons qualified by education and training to operate potentially hazardous equipment or use hazardous materials, unless under close supervision.
- Supervise students in the performance of activities.

2.6 Students- Cadets

Students are expected to always adhere to safety practices presented by faculty, technical staff, student assistants, graduate assistants or other authorized individuals. They must also report potentially hazardous conditions that become known to them. These reports should be made to their supervisors, faculty advisers, Department of Safety and Risk Management, or other responsible parties.

2.7 PPE Users

- Is trained on and applies "Safe-Work Rules" for users as outlined in this program.
- Always selects and uses a hand and power tools in a safe manner.
- Visual inspect prior to use.
- Alerts Owner Department Management when hand and/or power tools need repair/replacement.
- Assesses work to determine if fall protection should be worn and seeks alternative access methods instead of hand and/or power tools if need be.
- Proactively use Stop Work Authority when they feel there is an unsafe condition present by means of communicating with Department Management and SRM to work collaboratively to resolve and improve identified or perceived condition.

2.8 Owner Department

- The "Owner Department" is responsible to identify hazards/activities in their workplace and design into locations engineering controls such as guards, barriers, edge protection, etc., to prevent access to a hazard. Only when engineering controls cannot be used/implemented PPE may be used to aid in controlling hazards to personnel in a Department's operations/facilities.
- The department owning or exposing personnel to hazards is responsible for the selection of the proper equipment based upon a hazard analysis of work tasks. In addition, Owner Departments must provide training to their personnel who use the equipment, keep the records of training completed, and schedule semi-annual inspections of all equipment under their ownership/control.
- Toward this end, the Department owning the equipment must:
- Assign a Safety Program Coordinator to aid in operational program management for the Department.
- Notify SRM when new equipment is purchased so that it can be inspected and added to the JHA and Equipment inventory.
- Schedule with SRM a semi-annual inspection.
- Render unusable and then dispose of any equipment that is in any way questionably safe as determined by the inspector or the person using the equipment.

3.0 Process Management

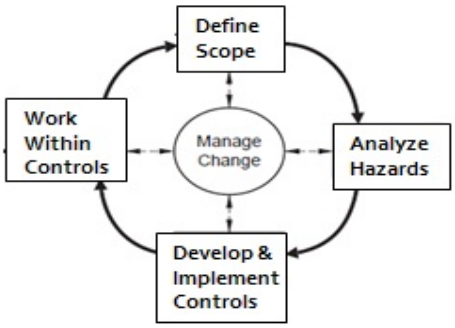
3.1 Hazard Identification, Risk Assessment & Control (HIRAC)

3.1.1 Integrated Safety Management (ISM)

Cal Maritime is committed to having all campus-related work performed safely and in a manner that strives for the highest degree of protection for the Campus Community. To achieve these goals, Cal Maritime implements, the principles of safety through an Integrated Campus Safety Management System (ICSMS).

Simply put, ICSMS applies a plan-do-check-act approach to campus safety management. Five core activities represent the plan-do-check-act approach, and comprise the underlying process for any construction work activity. The five core activities are:

1) Define the Scope of Work
2) Analyze the Hazards
3) Develop and Implement Hazard Controls
4) Perform Work Within Controls
5) Provide Feedback and Manage Change



The identification and analysis of workplace hazards is part of the pre-work planning process. The goal of this core activity is to ensure that the hazards associated with construction work activities are clearly understood and appropriately managed. All new campus work activities, changes to existing work or introduction of new equipment or processes (which introduce new hazards or increase the hazard level) need to be reviewed to analyze hazards, identify safety standards/requirements, and establish appropriate controls. Safety conditions and requirements need to be formally established and in place before construction work is initiated.

The campus Job Hazards Analysis (JHA) process is the principle method for achieving this.

3.1.2 Hazard Identification, Risk Assessment &Determining Control Table (HIRAC)

The EHS Hazard Identification, Risk Assessment and Determining Control Table (HIRAC) process is used to identify, assess and risk-rank Cal Maritime campus-related activities in order to ensure that Cal Maritime Campus Safety programs, activities and work controls are appropriately addressing construction risks. The initial HIRAC assessment and risk-ranking of campus-related activities was conducted during the third quarter, AY 2016-2017. The HIRAC assessment will be reviewed annually, when new campus-related activities are introduced that create or modify assessed risks, and when worksite observations or accident/incident experience identify previously unrecognized or incorrectly categorized risks.

3.1.3 Application of Hierarchy of Controls

In developing hazard controls and preparing the Job Hazard Analysis submittal, the campus shall select means and methods to mitigate worker exposure to workplace hazards using the Hierarchy of Controls as specified in the American National Standards Institute (ANSI) Z10-2005 Occupational Health and Safety Management Systems.
The campus shall make a good faith effort to analyze each hazard and identify the appropriate control(s) using the following hierarchy:

- Elimination or substitution of the hazards where feasible and appropriate;
- Use of engineering controls where feasible and appropriate;
- Application of work practices and administrative controls that limit worker exposures; and
- Provision and use of personal protective equipment

3.1.4 Job Hazards Analysis (JHA)

For the purposes of this section Job Hazard Analysis (JHA) and Job Safety Analysis (JSA) can be used synonymously. A JHA/JSA can be incorporated into a Pre Task Plan, provided there is a section for employees to review, comment and sign. Core components of the scope of work and relative hazards can be electronically completed ahead of time, provided there is room for current site conditions are able to be readily added as applicable. When the scope or conditions change, the change in work plan should be noted in a different colored pen with employee's initially that they have been briefed on the change.
The Department of Safety and Risk Management will work with individual Departments to develop a master Campus JHA library.

- Each employee scheduled to work in the activities identified below shall receive safety training in those activities prior to working on them.
- Subcontractors shall submit a Job Hazards Analysis (JHA) for those construction activities meeting the requirements for performing JHA (see below). The JHA shall be reviewed and authorized to proceed by the Cal Maritime Department of Safety and Risk Management before work commences.
- Subcontractor shall be responsible for submitting a JHA and work procedures to Cal Maritime Department of Safety and Risk Management for review a minimum of seven days prior to the start of work for most work activities.

3.1.4.1 JHA Requirements

A JHA shall be written based on the following conditions:

- Jobs with the highest injury or illness rates
- Jobs with the potential to cause severe or disabling injuries or illness, even if there is no history of previous accidents
- Jobs in which one simple human error could lead to a severe accident or injury
- Jobs that are new to your operation or have undergone changes in processes and procedures
- Jobs complex enough to require written instructions.

If not otherwise specified in a particular project specification, the JHA shall be performed in accordance with the OSHA 3071.

JHA processes. In general the JHA will include:

- Description of work phase or activity
- Identification of potential hazards associated with the activity
- Address further hazards revealed by supplemental site information (e.g., site characterization data, as-built drawings) provided by the subcontractors construction manager.
- A list of the Subcontractor's planned controls to mitigate the identified hazards
- Identification of specialized training required
- Identification of special permits required
- Name of the Subcontractor's Competent Person(s) responsible for inspecting the activity and ensuring that all proposed safety measures are followed.

3.2 Hazard Assessment ---Sample---

⚠ *Note: Each work scope will have its own JHA, refer to the JHA Library for more details.*

GENERAL HAZARD IDENTIFICATION & CONTROL MEASURES FOR EQUIPMENT USE			
TASK	**HAZARD**		**HAZARD CONTROLS & PROTECTION MEASURES**
OPERATION OF HAND AND/OR POWER TOOLS	**Use of Hand And/or Power Tools-** Cuts, abrasive, electric shock, injury form flying debris, tripping over power cords, electrocution		⚓ Wear goggles and dust musk if applicable. ⚓ Keep cords away from work area. ⚓ Keep tools in good condition. ⚓ Inspect tools before use. Verify that guards are working properly. ⚠ **DO NOT** put hand near blades. ⚓ Make sure you have a good center of gravity and maintain control at all times
	Electrical Hazard		⚓ Ensure all electrical equipment is properly grounded. (i.e. three prong electrical plugs) and in proper working order before using. ⚓ Strictly follow all manufactures precautions and recommendations. ⚠ **DO NOT** overload circuits by stringing multiple power strips (also known as daisy chaining)
	Caught in between Pinch Points Cuts, pinches, smashes, punctures, severing of fingers.		⚓ Wear safety glasses. Work away from yourself. ⚓ Use normal caution required for all hand tools.
	Caught in between Moving Parts		⚓ There are gears and exposed moving parts on machinery ⚓ Use LOCK-OUT procedures when performing maintenance or conducting any work within 12" of an exposed pinch point. ⚠ **NEVER** put your hands or feet near an exposed pinch point or gears.
	Crush Hazard to foot		⚓ Approved protective footwear is needed when there is the risk of foot injury due to slipping, uneven terrain, abrasion, crushing potential, temperature extremes, corrosive substances, puncture hazards, electrical shock and any other recognizable hazard

TRAINING REQUIREMENTS

DO NOT use this equipment unless an instructor or shop supervisor has instructed you in the safe use and operation and has authorized you to operate this equipment.

✓ IIPP	✓ Dept. Specific	✓ Operators/Owner's Manual	✓ Other:

PERSONAL PROTECIVE EQUIPMENT

Eye Protection	Foot Protection	Hand Protection	Hearing Protection	Body Protection	Head Protection	Respiratory Protection	Fall Protection	Face Shield	OTHER
When exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation...	When working in areas where there is a danger of foot injuries due to falling or rolling objects, or objects piercing the sole, or will protect the affected	When hands are exposed to hazards such as those from skin absorption of harmful substances; severe cuts or lacerations; severe abrasions; punctures; chemical burns	When exposed to a time weighted average noise level of 85 dBA or higher over an 8 hour work shift.	When exposure to: Intense heat, hot metals, other hot liquids Impacts from materials that can cut, burn Hazardous chemicals Or potentially infectious materials	Where there is a potential for injury to the head from falling objects and/or when there is a risk of impact to head	May be required if removal of contaminants from the air does not fall below permissible exposure level.	When there is a risk of falling from a height greater than 4ft GSO 6ft CSO 6ft MSO When working in confined space	Face shield can be used over the glasses if there is a presence of a lot of flying debris.	

3.2.1 Exposure Potential

- **Exposures**: The condition of being unprotected from a possible injury source.
- **Ballistic Exposure**: exposures consist of flying or dropped materials that may strike and injure an employee on the job causing a blunt or penetrating trauma.
- **Biological Exposure:** exposures consist of any biological agent that may cause personal injury.
- **Blunt Trauma Exposure:** refers to a type of physical trauma caused to a body part by impact. Resulting injury may be concussions, abrasions, lacerations, and/or bone fracturing. Blunt trauma is contrasted with penetrating trauma, in which an object such as a hypodermic needle enters the body.
- **Chemical Exposure:** exposures consist of any chemical agent that may cause personal injury.
- **Confined Space Entry Exposure:** exposures consist of any confined workplace that may result in injury.
- **Extreme Temperatures**: working in very high or very low temperatures either localized or in the general environment can cause injuries.
- **Fall Exposure:** exposures consist of any work activity from elevated heights or ladders.
- **Fire Exposure:** exposures working around open flames or from fighting a fire.
- **Hazardous Materials:** exposure to any material which poses a health and safety threat to employees and/or as a result of improper handling or disposal methods or accidental discharge. PPE may consist of gloves, safety glasses, goggles, face shields, clothing and creams.
- **Penetrating Trauma Exposure:** exposures to puncture wounds while in a work environment.
- **Radiation Exposure:** exposures to harmful ionizing or non-ionizing radiation in which an employee may work.
- **Respiratory Exposure:** exposures to harmful contaminants in the air in which an employee may work.
- **Rolling Stock:** exposures to powered and non-powered rolling carts, dollies and pallet movers used to manually transport heavy materials and equipment. PPE may consist of gloves and hard toed shoes.
- **Sharp Objects:** exposures to tools, equipment and materials with sharp points or edges. PPE may consist of gloves, special clothing and safety glasses.

3.3 Personal Protection Devices:

While personal protective equipment is an effective loss control tool in accident and injury prevention, these devices still do not reduce or eliminate the hazards. Thus, PPE is advised when it is not feasible to render the workplace environment adequately safe. It is not the University's intention to make PPE the sole protection but a supplement to effective environmental control coupled with safe work procedures and proper training.

Supervisors must take care when considering the appropriate PPE for a specific or combination of hazards. Selecting the correct PPE may mean choosing from a variety of types, materials, functions and design to achieve the most cost effective protection without compromising safety. Many PPE devices available require choices among several variables and priorities over and above cost. These choices are best made in consultation with the safety personnel in the Environmental Health & Safety Department.

Any clothing or equipment provided by the University that is designed and constructed to safeguard the wearer exposed to a specific physical hazard. Such as:

- **Body Protection Equipment:** used by employees exposed to potential injury to the body, trunk, limbs or torso. PPE may consist of special clothing.
- **Eye/Face Protection Equipment:** used by employees exposed to potential injury from harmful light or airborne particles in the work environment. PPE may consist of special safety glasses, goggles or face masks.
- **Fall Protection Equipment:** used by employees exposed to potential by working at above ground levels of 6 feet or more. PPE may consist of Personal Fall Arresting Systems. Components of a personal fall arresting system, detailed in the "Fall Protection Program," include a body harness, lanyard, lifeline, connector, and an anchorage point capable of supporting at least 5000 pounds
- **Foot Protection Equipment:** used by employees exposed to potential injury to the feet. PPE may consist of special shoes, boots or metatarsal guards.

- **Hand Protection Equipment:** used by employees exposed to potential injury to hands. PPE may consist of special gloves or hand creams.
- **Head Protection Equipment:** used by employees exposed to potential injury to the head. PPE may consist of special hats, helmets or bump caps.
- **Hearing Protection Equipment:** used by employees exposed to excessive levels of sound as specified in the University's "Hearing Conservation Program." PPE may consist of special earplugs or earmuffs.
- **Radiation Protection Equipment:** used by employees exposed to potential injury as specified in the University's "Radiation Safety Manual." PPE may consist of safety glasses, protective clothing and gloves.
- **Respiratory Protection Equipment:** used by employees exposed to potential injury to the lungs and associated breathing functions as specified in the University's "Respiratory Protection Program." PPE may consist of special dust masks, respirators of single or multiple use and air supplied types.
- **Skin Protection Equipment:** used by employees exposed to potential injury (i.e., dermatitis) from chemical or others hazardous materials they may need to handle in the course of their work assignments. PPE may consist of gloves, special protective hand creams, sunscreen or clothing.

3.3.1 Eye Protection

General

Suitable safety eyewear shall be provided and used where machinery, equipment, or operations present the hazards of flying objects, impact, liquids, chemicals, injurious energies (laser, glare, radiation, etc.), intense heat/cold, or a combination of these hazards. Care should be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Certain operations require face protection in addition to eye protection and unless specifically designed for such uses, face shields are not to be worn in lieu of safety eyewear. The selection, use, and maintenance of safety eyewear shall be in accordance with ANSI Z87.1-2003 Occupational and Educational Personal Eye and Face Protection Devices, or equivalent.

It is essential that eye and face protectors be kept clean. They shall be cleaned and inspected daily. Pitted or scratched lenses or face shields reduce vision and seriously reduce protection. Accordingly, lenses and face shields shall be replaced when they are pitted or scratched to such a degree that vision is obscured.

Safety Glasses

Safety glasses shall meet the impact requirements of ANSI Z87.1 or equivalent. Lenses and frames shall be marked with the manufacturer's symbol to indicate compliance with ANSI Z87.1. The use of approved lenses in unapproved frames is not acceptable. Tinted lenses in safety glasses for minimizing solar glare are permissible only when used outdoors during daylight hours. Prescription safety glasses can be worn by personnel whose vision requires the use of corrective lenses.

Side Shields

Side shields are required on safety glasses worn in eye-hazard areas and operations, unless it has been specifically determined for a particular operation that it is not possible for injurious objects or energies to enter the wearer's eyes from the side or that the reduced peripheral vision would pose a greater hazard to the employee. Side shields shall not be easily detachable from the frames; snap-on or slip-on types of side shields are not acceptable unless secure.

Goggles

Goggles or eyecups shall be worn to protect against dust particles, liquids, splashes, mists, spray, and injurious radiation. They shall be designed to protect the eye sockets and the facial area around the eyes, thus protecting the wearer from side exposure. They can be worn over corrective eye glasses if they do not disturb the adjustment of the glasses, or corrective lenses can be incorporated into the goggle by mounting behind the protective lens.

Laser Protection

Eye protection for laser operations must be in compliance with ANSI Z136.1-2007 Safe Use of Lasers, or equivalent.

Welding Shades

Shades in the form of spectacles, goggles, hand-held shields, or helmets are necessary when you are welding, brazing or torch-cutting, or when such work is being performed near you. Hazard assessment for the operation will determine the appropriate shade value. Filter lenses must meet the requirements for shade designations in OSHA 1910.133(a) (5) and be identified as such.

3.3.2 Head, Neck and Face Protection

General

Head, neck and face protection must be worn when employees are exposed to working environments where they might be struck on the head, strike their head against an overhead hazard, entangle their hair or be exposed to flying debris (e.g., chips, particles, sand, molten metal, etc.), or to chemical splashing, high voltage, electric shock or a combination of these hazards.

Face Shields

Face shields shall be worn to protect the face and front of the neck from flying particles and sprays or splashes of hazardous liquids.

Hard Hats

Hard hats shall be constructed, selected, used, and maintained in accordance with ANSI/ISEA Z89.1-2009 Industrial Head Protection. Be certain that hard hats provided are not bump caps, make the selection based on the ANSI descriptions of Protective Helmets, and ensure that the helmet is marked with certification (manufacturer's name, the legend "ANSI Z89.1" and the class designation of G, E, or C).

- Class G (General) Helmets are designed to decrease the impact of falling objects and to lessen the risk of being exposed to low-voltage electrical conductors. Helmets are tested at 2200 volts of electrical charge in order to be certified.
- Class E (Electrical) Helmets are also intended to decrease the impact of falling objects, but these helmets reduce the risk of coming into contact with High-voltage electrical conductors. They are tested at 20,000 volts of electrical charge in order to receive certification.
- Class C (Conductive) Helmets also reduce the force of impact of falling objects, but do not protect against electrical contact.

Hair Protection

Long hair, including long facial hair, which is susceptible to becoming entangled in moving machinery or drawn into such machinery by the generation of static electricity, shall be controlled by caps or hair nets.

Welding Helmets

Welding helmets are designed to protect the welder from particles of hot metal and their eyes from arc radiation. Hand held shields are available for those standing nearby and observing. When selecting a helmet, be sure the helmet packaging and product advertises either "ANSI Z87.1-2003" or "Z87+."

3.3.3 Foot Protection

General

Unless otherwise noted, the term shoe as used herein includes boots. Protective footwear should be worn in areas where there is a danger of foot injuries due to falling, rolling, or puncture from objects; slips, trips and falls from slippery or wet surfaces; and exposure to electrical or chemical hazards. Protective footwear (other than slip-resistant footwear and overshoes) must comply with ASTM F2413-05 Standard Specification for Performance Requirements for Foot Protection. Protective footwear must first meet the requirements for impact and compression resistance before being ASTM certified. Requirements for additional protection can then be met and would fall under the following categories:

Protective Footwear

Metatarsal (Mt)

The purpose of metatarsal footwear is to prevent or reduce the severity of injury to the metatarsal and toe areas. Metatarsal protection should be an integral and permanent part of the footwear that covers the instep. Add-on devices are acceptable as long as they provide protection equivalent to ASTM performance standards.

Dielectric Insulation (DI)

DI footwear provides additional insulation if accidental contact is made with energized electrical conductors, apparatus or circuits and must meet the minimum insulation performance requirements of ASTM F1117-03 (2008) Standard Specification for Dielectric Footwear and tested with the ASTM F1116-03 (2008) Standard Test Method for Determining Dielectric Strength of Dielectric Footwear.

Electrical Shock Resistant (EH)

Footwear designed to reduce the hazards due to the contact of the sole with electrically energized parts and to provide secondary electrical hazard protection on substantially insulated surfaces. The soles of electrical hazard footwear are non-conductive and must be capable of withstanding the application of 14,000 volts at 60 hertz for one minute with no current flow or leakage current in excess of 3.0 milliamperes, under dry conditions.

Conductive Footwear (Cd)

Footwear designed to discharge static electricity from your body through your shoes into grounded floors. Floors must be grounded so that a charge can be dissipated. Conductive footwear is designed and manufactured to minimize static electricity and to reduce the possibility of ignition of volatile chemicals, explosives, or explosive dusts. The electrical resistance must range between zero and 500,000 ohms.

Warning – Conductive footwear may NOT be worn near open electrical circuits or highly charged objects of any kind that require Electrical Hazard (NON-conductive) footwear.

Static Dissipative (SD)

This type of footwear is designed to reduce the accumulation of excess static electricity by conducting body charge to ground, while maintaining a high enough level of electrical resistance to reduce the possibility of electric shock. The footwear must have electrical resistance between 10^6 ohms and 10^8 ohms.

Chain Saw Cut Resistant (CS)

This footwear is designed to protect the foot area between the toe and lower leg when operating a chain saw and must meet the ASTM F1818-04 Standard Specification for Foot Protection for Chainsaw Users.

Puncture Resistant (PR)

A puncture resistant device located in the shoe sole reduces the possibility of puncture wounds to the soles of the feet by objects that could penetrate the outsoles of the footwear.

Slip Resistant

Shoes with tread composition and tread pattern designed to give better traction than standard shoes on slippery surfaces shall be worn to prevent slips and falls in wet environments.

Overshoes

Rubber or neoprene overshoes are designed to protect against splashing liquids or chemicals.

3.3.4 Hand Protection

General

Suitable hand and lower arm protection shall be provided and used where machinery, equipment or operations present the hazards of mechanical injury, extreme heat or cold exposure, chemical exposure, blood and body fluids (BBF), hazardous drugs, radiation, electrical shock, vibration, or a combination of these hazards.

Safety Glove Size Chart

When a hazard assessment identifies a need for hand protection, it is the responsibility of the employer to determine the best glove for the task at hand. No matter the type (anti-vibration, chemical resistant, cut resistant, etc.), once the glove is selected, then proper sizing comes into play.

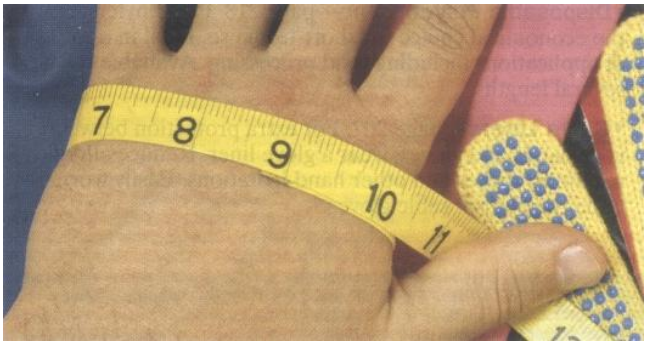
Ordering gloves too small or too large can result in job completion delays, as well as possible hand injuries. If too small, the gloves can be uncomfortable and cause hand fatigue. If the glove material is stretched beyond its capabilities, it could tear or rip easily when in use, which is wasteful, costly and increases the possibility of injury due to an unprotected hand. A glove that is too small can also compromise hand dexterity for the wearer, so the chances of the end user wearing the glove for the intended purpose is reduced. Then again, when you select hand protection that is too large it may literally be pulled off the hand.

How to Determine Glove Size

It is important to know how to measure the hand to get a proper fitting glove. Measuring the hand for correct fit will help to give the employee the best possible protection.

One method used to find the correct glove size is to measure around the dominant hand with a soft cloth tape measure as shown below. The dominant hand measurement is preferred (right if you are right-handed and left if you are left-handed).

If the gloves you are purchasing come in numbered sizes, you can correlate the inch measurement directly to the numerical size listed for the glove. For example, if the measurement taken is 8 inches, then you would select a size 8 glove. If the measurement is over 8 inches, then the next size larger should be selected to avoid hand fatigue from wearing a glove that's too small. If the gloves you are purchasing come in lettered sizes, such as XS, S, M, L or XL, these can be converted to a numerical size for easy selection using the following glove size chart:



Gloves

Thermal Gloves

A variety of gloves are designed to protect workers' hands and arms from the extremes of hot or cold when working with autoclaves, cryogenics, kitchen equipment, food, welding, or laboratory equipment. Gloves should be chosen based on the extreme of temperatures expected along with conditions of wet, dry, and abrasive.

Disposable Gloves

Disposable gloves are used most commonly in food processing or assembly, laboratories, industrial, and healthcare applications. They are available in latex rubber, nitrile, polyethylene, PVC, neoprene, vinyl and other synthetic materials. Latex is being replaced by other suitable alternatives because of the latex allergy concern.

Chemotherapy Gloves

These are disposable gloves that are designed for use when handling chemotherapy drugs or any hazardous drug that is being compounded, prepared or administered. They should be tested according to the ASTM D6978-05 Standard Practice for

Assessment of Resistance of Medical Gloves to Permeation by Chemotherapy Drugs (after 2005) or F739-07 Standard Test Method for Permeation of Liquids and Gases through Protective Clothing Materials under Conditions of Continuous Contact (before 2005), and approved by the FDA for use with chemotherapy drugs.

Cut-Resistant Gloves

Cut-resistant gloves are designed to protect hands from direct contact with sharp edges such as glass, metal, ceramics and other materials. Cut resistance is a function of a glove's material composition and thickness. You can increase the level of cut protection by increasing material weight (i.e., ounces per square yard); by using high-performance materials such as Dyneema®, Kevlar®, etc.; or by using composite yarns made with varying combinations of stainless steel, fiberglass, synthetic yarns and high-performance yarns.

Performance characteristics are not only affected by a material's weight, but also by the coatings applied to the outside surface. Lighter-weight styles offer more dexterity, resulting in less hand fatigue, while their heavier counterparts generally provide more cut and abrasion protection. Coated gloves enhance grip, especially on slippery surfaces. However, some coated gloves may not be appropriate for food handling applications.

Cut-resistant fibers and materials include, but are not limited to:

- **Dyneema®**: A super-strong polyethylene fiber that offers maximum strength combined with minimum weight. It is up to 15 times stronger than quality steel and up to 40% stronger than aramid fibers, both on a weight-for-weight basis. Dyneema® floats on water and is extremely durable and resistant to moisture, ultraviolet light and chemicals.
- **Kevlar®Aramid Fiber**: A synthetic polyamide that is five times stronger than steel per unit weight. Inherently flame resistant, it begins to char at 800°F (427°C). The thread made of Kevlar® fiber is used to sew seams on temperature-resistant gloves. Kevlar® gloves offer cut and heat resistance. Typically, it is a lightweight and flexible material used for many applications relating to automotive assembly, sheet metal handling and glass handling.
- **Fiber-Metal Blends**: Many durable, abrasion-resistant gloves are made of a woven fabric blend of Kevlar® and stainless steel.
- **Metal Mesh**: Interlocked stainless steel mesh offers superior cut and abrasion protection due to its strength. Metal mesh gloves are very cut and abrasion resistant and are often used in meat/poultry applications.
- **Super Fabric**: Combinations of the number of layers, thickness, substrates, surface coatings, etc., lead to fabrics that have varying levels of puncture, cut and abrasion resistance, grip and flexibility. Tactile surfaces offer improved grip of wet and oily surfaces.
- **Steel Core**: Cut and abrasion resistant and are often used for meat/poultry processing, glass handling, metal fabrication, automotive manufacturing as well as being used in the paper industry.

The ANSI/ISEA 105-2016 "American National Standard for Hand Protection" defines performance levels for cut resistance, blunt object puncture resistance, hypodermic needle puncture resistance and abrasion resistance. The standard provides guidance on the test methods used as well as pass/fail criteria so that you can determine what hand protection products may meet your needs.

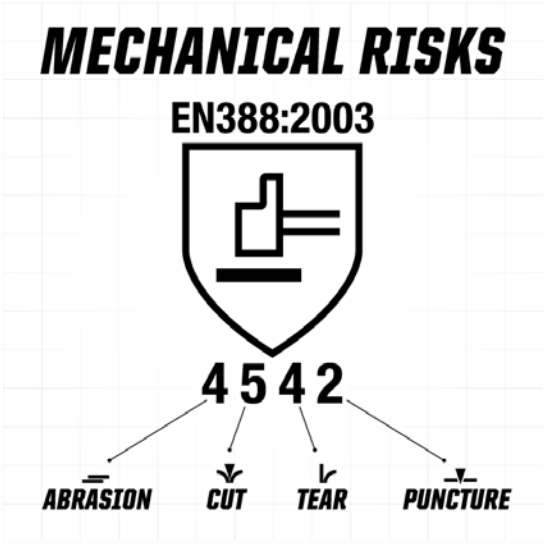
ANSI/ISEA 105-2016 vs. 105-2011

ANSI/ISEA 105-2016		**ANSI/ISEA 105-2011**	
Weight (grams) needed to cut through Test Method: ASTM F2992-15)	New Cut Level Rating	Weigh(grams) needed to cut through (Test Method: ASTM F1790-97 or ASTM F1790-05)	Old Cut Level Rating
N/A	N/A	< 200	0
≥200	A1	≥200	1
≥500	A2	≥500	2
≥1000	A3	≥1000	3
≥1500	A4	≥1500	4
≥2200	A5	≥3500	5
≥3000	A6	N/A	N/A
≥4000	A7	N/A	N/A
≥5000	A8	N/A	N/A
≥6000	A9	N/A	N/A

The European Standard EN 388, "Protective Gloves against Mechanical Risks" uses different level groupings and a completely different method of testing than ANSI/ISEA 105. No approved changes have been made to EN 388 at this time. ANSI/ISEA 105 and EN 388 cut levels are not interchangeable.

EN 388 Cut-Resistance Performance Levels

Performance Level	Blade Cut Resistance (Cut Index)
1	1.2 -2.4
2	2.5 – 4.9
3	5.0 – 9.9
4	10.0 – 19.9
5	20



Chemical Resistant Gloves

These gloves can be disposable or re-useable and generally do not protect against all chemical hazards. The appropriate glove material must be selected that provides resistance to the specific chemical hazard that will be encountered, such as acids, alcohols, oils, corrosives, and solvents.

Electrical Gloves

Rubber and leather insulating gloves, mittens, and sleeves are designed to protect the worker from electrical hazards such as fire ignition, electric shock, arc flash and blast. The proper gloves shall be chosen in accordance with the NFPA 70E (2009) Standard for Electrical Safety in the Workplace and tested to appropriate voltage meeting ASTM D120-09 Standard Specification for Rubber Insulating Gloves.

ASTM Labeling Chart
Natural Rubber Electrical Insulating Gloves

Class Color	Proof Test Voltage AC/DC	Max. Use Voltage AC/DC	Insulating Rubber Glove Label
00 Beige	2,500 / 10,000	500 / 750	10 ASTM D120 CLASS 00 MAX USE VOLT 500V AC EN60903 TYPE I
0 Red	5,000 / 20,000	1,000 / 1,500	10 ASTM D120 CLASS 0 MAX USE VOLT 1000V AC EN60903 TYPE I
1 White	10,000 / 40,000	7,500 / 11,250	10 ASTM D120 CLASS 1 MAX USE VOLT 7500V AC EN60903 TYPE I
2 Yellow	20,000 / 50,000	17,000 / 25,500	10 ASTM D120 CLASS 2 MAX USE VOLT 17000V AC EN60903 TYPE I
3 Green	30,000 / 60,000	26,500 / 39,750	10 ASTM D120 CLASS 3 MAX USE VOLT 26000V AC EN60903 TYPE I
4 Orange	40,000 / 70,000	36,000 / 54,000	10 ASTM D120 CLASS 4 MAX USE VOLT 36000V AC EN60903 TYPE I

Anti-Vibration Gloves

Padded gloves are used to prevent hand-arm vibration syndrome (HAVS) that often occurs from repeat exposure to vibration. Highly specialized tasks such as operating chain saws, grinders, nail guns, sanders and any machinery that produces high levels of vibration would put employees at risk for HAVS.

General Purpose Gloves

These gloves are available in jersey, canvas or string knits, leather, or as leather palm work gloves. They protect against abrasion and can be unlined or lined for cold weather.

Finger Cots

Made of latex, nitrile rubber, vinyl, cotton, or leather, these individual finger covers can be used in the healthcare industry, food processing and when handling rough, sharp, and hot surfaces.

3.3.5 Protective Clothing

General

Protective clothing includes coveralls, aprons, sleeves, leggings, and garments that cover the body. These items are intended to protect the wearer against heat, cold, moisture, toxic chemicals, acids, corrosives, electricity, biological and physical hazards such as sharp objects, flying objects, excessive dust, grease, etc.

When specific items of personal attire are judged to be hazardous to an operation or work environment, their use shall be prohibited. Some examples: The wearing of long sleeves, jewelry, and loose-fitting or dangling clothing shall not be permitted around rotating machinery; silk, wool, rayon, nylon, and other synthetic fiber garments shall not be worn in any operation in which the generation of static electricity would create a hazard.

Suitable attire, including appropriate shoes, normally worn by prudent individuals to avoid unnecessary risk, is the responsibility of the employee and is considered a condition of employment.

Special Clothing

Where employees are required to wear special protective clothing that necessitates changing from street clothes, a designated location for changing clothes and suitable clothing lockers will be provided.

Special protective clothing worn on the job shall not be worn or taken away from the premises by employees, since this may expose other persons to unnecessary risk caused by contaminated clothing. The Department will be responsible for cleaning and drying special clothing contaminated with or exposed to hazardous materials or for proper disposal in the event contaminated clothing needs to be discarded.

Paperlike Fiber

Disposable suits made of this material provide protection against dusts.

Tyvek®

Garments of differing formulations provide a variety of protection ranging from non-hazardous dusts to dry particulate hazards such as lead dust, mold, asbestos, and other aerosol hazards.

Tychem®

These garments protect against a wide range of chemical hazards ranging from light to moderate liquid splash to higher levels of protection for hazmat applications.

Kevlar®

Kevlar is a synthetic fiber which is highly resistant to cuts and punctures.

Treated Wool and Cotton

Protective clothing made from treated wool and cotton adapts well to changing workplace temperatures and is comfortable as well as fire resistant. Treated cotton and wool clothing protects against dust, abrasions, and rough and irritating surfaces.

Duck

Duck is a closely woven cotton fabric which protects against cuts and bruises during the handling of heavy, sharp, or rough materials.

Leather

Leather gloves protect against dry heat, flame, cuts, and abrasion.

Rubber, Rubberized Fabrics, Neoprene and Plastics

- Protective clothing made from these materials protects against certain acids and other chemicals.
- Clothing for protection from electrical hazards shall conform to the NFPA 70E Table 130.7(C) (8), Standards on Protective Equipment.

Protera™

Protera garments meet the NFPA 70E Category 2 requirements for protection from electric arc hazards.

Nomex®

This is a flame resistant synthetic fiber that will not melt, drip or support combustion and is combined with high break strength, tear resistance and abrasion resistance properties.

High Visibility Clothing

When employees are performing work in the road or in the right-of-way, they shall wear high-visibility clothing that conforms to ANSI/ISEA 107-2004 *High-Visibility Safety Apparel and Headwear*, Class 2 requirements at a minimum.

3.3.6 Fall Protection

Personnel may be exposed to fall hazards when performing work on a surface with an unprotected side or edge that is 4 feet or more above a lower level, or 10 feet or more on scaffolds. Fall protection may also be required when using vehicle man lifts, elevated platforms, tree trimming, performing work on poles, roofs, or fixed ladders. Workers must use fall protection where required. A personal fall arrest system consists of a full-body harness, lanyard, lifeline and snaphooks, and must be in compliance with OSHA 29 CFR 1926, Subpart M, Fall Protection.

3.3.7 Hearing Protection

Hearing protection is required for employees working in areas where they are exposed to noise at or above 85 dBA, or while working with equipment that generates noise at or above 85 dBA.

3.3.8 Respiratory Protection

Employees may be exposed to respiratory hazards that require the use of respirators, such as during emergency response, handling animals, working with hazardous chemicals, disturbing asbestos, welding, painting, etc. Employees needing respiratory protection will be placed on the Respiratory Protection Program prior to respirator use.

3.4 Personal Protective Equipment Requirements for Laboratories/Technical Areas

The following minimum attire and PPE requirements pertain to all laboratories/technical areas where use or storage of hazardous materials occurs or a physical hazard exists. This section should be used as the basis for developing the required PPE elements to include in the course syllabus for laboratory classes. The wearing of required PPE may only be modified as determined by a standard operating procedure or the laboratory hazard assessment.

3.4.1 Attire when occupying a Laboratory/Technical Area

Full length pants (or equivalent) and closed toe/heel shoe attire must be worn at all times by all workers who are occupying or entering a laboratory/technical area. The area of skin between the pants and shoe should not be exposed.

3.4.2 PPE when working with, or adjacent to, hazardous material use areas within a Laboratory/Technical Area

Laboratory coats (or equivalent protective garments) and protective eyewear are required to be worn by all workers working with hazardous materials. In addition, laboratory personnel occupying the adjacent area, who have the potential

to be exposed to chemical splashes or other hazards as determined by SOP requirements and/or the laboratory hazard assessment, are required to wear laboratory coats (or equivalent protective garments) and protective eyewear.

Laboratory coats must be appropriately sized (and if necessary fitted) for the worker. Coats must be buttoned/snapped to their full length. Laboratory coat sleeves must be of a sufficient length to prevent direct skin exposure while wearing gloves.

Flame Resistant (FR-rated) laboratory coats must be worn when working with any amount of pyrophoric materials. FR-rated lab coats are also required when working with flammable liquids in laboratories using open flames or other potential ignition sources; or as determined by the hazard assessment.

Laboratory coats shall not be laundered at private residences or public laundry facilities. Any protective clothing that becomes contaminated with hazardous materials must be decontaminated prior to being laundered or appropriately discarded. Campuses are responsible for providing suitable laundry services to maintain required laboratory coats.

All protective eyewear must meet American National Standards Institute (ANSI) standards and be appropriate for the work being done. Typical prescription spectacles are not suitable eye protection. Prescription safety glasses/goggles are available through individual campus procurement offices. Protective eyewear may be removed when using optical microscopes or similar instruments, requiring close contact between the eyes and the eyepieces.

Protective gloves must be worn while using any hazardous materials, hot or cold liquids (including cryogenics), objects that pose a risk of thermal burns, items having physical hazards, or equipment that may cause hand injury. These gloves must be appropriate for the material or process being used and must not interfere with the ability of the worker to work safely. The Safety Data Sheet (SDS) for the material and the manufacturer-specific glove selection guide should be referenced to determine appropriate glove type.

Some operations and procedures may warrant additional PPE, as indicated by the Safety Data Sheet (SDS), the Standard Operating Procedures (SOP), facility policies, regulatory requirements, or the hazard assessment. These might include face shields, aprons, respiratory protection, hearing protection, etc.

3.4.3 For Students:

Academic courses which include laboratory, shop or field work are required to indicate PPE requirements (including specifications of the type of PPE) as part of the course syllabus. These PPE items shall be the responsibility of the student to obtain and wear as part of the class. Common communal PPE such as thermal protective, welding aprons, face shields, etc., will be provided by the sponsoring department. The instructor of record for a course, or designee, is responsible for ensuring that students are familiar with and properly using required protective devices.

3.4.4 Exceptions

The minimum personal protective equipment requirements for Laboratories/Technical Areas will not apply to:

- Laboratories/technical areas which have been designated and posted as free of physical or chemical hazards. Examples: Laboratories/technical areas that house only operations with no inherent physical or chemical hazards during normal, reasonably foreseeable upset (unexpected occurrence), or routine maintenance activities. Examples include some electron microscope rooms, precision measurement rooms, etc.
- Exceptions that require written approval from their campus Department of Safety & Risk Management or SRM approved department designees. SRM has the final authority for determining this risk assessment.
- The establishment of non-PPE required corridors that may be delineated within technical areas provided that the corridor does not pass near any potential exposure hazard.
- Non-hazardous work areas (e.g., offices, work stations) that are within laboratory/technical areas but are clearly delineated by distance or physical barrier (e.g., walls, doors, or cubicle dividers). It must be clear that the area is intended to be a self-contained, dedicated area. Readily movable furniture does not constitute a physical barrier

as envisioned here.

- Exceptions for individual desks or work spaces within a Technical Area are discouraged.
- The requirement to use PPE is a function of the type of work (activities), the duration of the exposure (e.g., time weighted average for sound level) and the degree of physical contact (action level to implement controls) with the potential injury/illness source. However, each job at the University has varying degrees of exposure to injury ranging from minuscule to severe. Over the course of many years of job analysis and safety investigations the University published a number of Environmental Health and Safety Programs to identify those injury sources and to mitigate employee accidental injuries.

Because the purchase, training, use and enforcement of personal protective equipment is implemented across a cross-section of departments at Cal Maritime, the most expedient way for a supervisor to assess the need for PPE is to examine the existing EH&S Safety and Health programs.

For example, the specific "Hearing Conversation Program," to evaluate potential injury to hearing by loud sustained noise, was established to identify the activities where loud noise may exist and to determine if the sound exceeds minimum standards as published by the government. Appropriate hearing PPE can be found in this program.

In the case of an injury potential for getting a foreign body embedded in the eye, the exposure may exist at very many job activities. However, experience has shown that the level of eye injury potential is greater where there is flying particles from wood sawing operations or metal chips from grinding. Thus, those activities, that have this increased injury potential, would be subject to mandatory eye protection for the employee through other specific programs.
Several other programs where PPE, to some extent, is specified include:

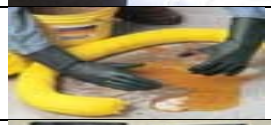
- Blood-borne Pathogens Program
- Chemical Hygiene Program
- Energized Electrical Work
- Energized Work Program
- Fall Protection Program
- Respiratory Protection

Supervisors, responsible for the on-the-job health and safety of the employee, should look first to the specific program that details the PPE required. If the hazardous job is occasional or does not fit into a specific program, the SRM Department will assist with PPE selection and training as required to protect the employee.

3.5 Glove Comparison Chart

Glove Comparison Chart

Summary: Consult this chart for an overview of commonly used glove types for laboratory use and their general advantages and disadvantages. **Note:** These photos are examples. Glove colors and appearances will vary. Many other models are commercially available in each glove category

Glove Material	Intended Use	Advantages and disadvantages	Example Photos
Latex (natural rubber)	Incidental contact	Good for biological and water-based materials. Poor for organic solvents. Little chemical protection. Hard to detect puncture holes. Can cause or trigger latex allergies	
Nitrile	Incidental contact (disposable exam glove) Extended contact (thicker reusable glove)	Excellent general use glove. Good for solvents, oils, greases, and some acids and bases. Clear indication of tears and breaks. Good alternative for those with latex allergies	
Butyl rubber	Extended contact	Good for ketones and esters. Poor for gasoline and aliphatic, aromatic, and halogenated hydrocarbons.	
Neoprene	Extended contact	Good for acids, bases, alcohols, fuels, peroxides, hydrocarbons, and phenols. Poor for halogenated and aromatic hydrocarbons. Good for most hazardous chemicals.	
Norfoil	Extended contact	Good for most hazardous chemicals. Poor fit (Note: Dexterity can be partially regained by using a heavier weight Nitrile glove over the Norfoil/Silver Shield glove.	
Viton	Extended contact	Good for chlorinated and aromatic solvents. Good resistance to cuts and abrasions. Poor for ketones. Expensive.	
Polyvinyl chloride (PVC)	Specific use	Good for acids, bases, oils, fats, peroxides, and amines. Good resistance to abrasions. Poor for most organic solvents.	
Polyvinyl alcohol (PVA)	Specific use	Good for aromatic and chlorinated solvents. Poor for water-based solutions.	
Stainless steel Kevlar Leather	Specific use	Cut-resistant gloves. Sleeves are also available to provide protection to wrists and forearms. (If potential for biological or chemical contamination: wear appropriate disposable gloves on top of your cut-resistant gloves and discard after use).	 
Cryogenic Resistant Material Leather	Specific use	For use with cryogenic materials. Designed to prevent frostbite. Note: Never dip gloves directly into liquid nitrogen.	

3.6 Internal Workplace Hazard Assessment and PPE Evaluation

The Internal Workplace Hazard Assessment and PPE Evaluation Form is used by EH&S to document that the area identified had undergone a workplace hazard assessment and verify that the use of PPE is appropriate for the hazards found. EH&S will be responsible for conducting this assessment and maintaining records. Any suggestions for safety enhancement will be communicated to the proper department personnel. Department supervisors may download this form and conduct a self-evaluation whenever conditions in the department change.

Selection Tables

The following tables give the department person responsible for PPE a quick overview of the selections available. It is but the first step in the process of providing PPE for our employees.

JOB TITLE	PPE SUGGESTED
Admin Support Coordinator	Job specific
Administrator	Job specific
Air Cond/Refrig Mechanic	Safety Glasses, Ear Plugs
Athletic Equipment Attendant	Job specific
Auto/Equipment Mechanic	Safety Glasses, Ear Plugs
Building Service Engineer	Safety Glasses, Ear Plugs
Buyer	Job specific
Carpenter	Safety Glasses, Ear Plugs
Clinical Aid	Gloves, Safety Glasses
Clinical Lab Technologist	Gloves, Safety Glasses
Coach	Sports specific
Coaching Assistant	Sports specific
Corporal	Clothing
Custodian	Gloves, Safety Glasses
Dept Chair	Job specific
Dup Machine Operator	Job specific
Electrician	Gloves, Safety Glasses
Equip Systems Specialist	Job specific
Equip Tech, Mechanical	Gloves, Safety Glasses, Ear Plugs
Equip Tech, Electronic	Job specific
Equip Tech, Specialized Equip	Gloves, Safety Glasses, Ear Plugs
Facilities Project Supv.	Job specific
Facilities Worker	Gloves, Safety Glasses
Graduate Assistant	Job specific
Groundsworker	Gloves, Safety Glasses, Ear Plugs. Hard hats, Filter masks
Head Coach	Gloves, Safety Glasses
Heavy Equip Operator	Gloves, Safety Glasses, Ear Plugs, Hard hats
Bus Driver	Job specific
Interpreter	Job specific
Instr Fac (non-Science)	Job specific
Instr Fac (Science)	Gloves
Instructional Support Asst	Job specific
Instructional Support Tech	Job specific
Laborer	Gloves, Safety Glasses, Ear Plugs, Hard hats
Lead Auto/Equip Mechanic	Gloves, Safety Glasses
Lead Carpenter	Gloves, Safety Glasses
Lead Custodian	Gloves, Safety Glasses
Lead Electrician	Gloves, Safety Glasses
Lead Groundsworker	Gloves, Safety Glasses
Lead Locksmith	Safety Glasses

Lead Painter	Gloves, Safety Glasses
Lead Plumber	Gloves, Safety Glasses
Lecturer	Job specific
Licensed Vocational Nurse	Gloves
Light Auto Equipment Operator	Job specific
Locksmith	Safety Glasses
Mail Clerk	Job specific
Mail Services Supervisor	Job specific
Mason	Gloves, Safety Glasses, Safety Shoes
Metal Worker	Gloves, Safety Glasses, Ear Plugs
Network Analyst	Job specific
Notetaker	Job specific
Nurse Practitioner	Safety Glasses
Operations Specialist	Job specific
Painter	Gloves, Safety Glasses, Respirators, Masks
Parking Officer	Job specific
Performing Arts Tech	Gloves, Safety Glasses, Respirators
Pest Control And Spray Specialist	Gloves, Safety Glasses, Respirators
Physician	Gloves, Safety Glasses, Job specific
Plumber	Gloves, Safety Glasses, Hard hats, Respirators
Police Officer	Clothing, Job Specific
Police Officer Cadet	Clothing, Job Specific
Registered Nurse	Gloves, Safety Glasses, Clothing
Sergeant	Clothing, Job Specific
Speech Pathologist	Job specific
Supervising Carpenter	Gloves, Safety Glasses, Ear Plugs
Supervising Plumber	Gloves, Safety Glasses, Respirators
Storekeeper	Job specific, Safety Glasses
Supervising Electrician	Gloves, Safety Glasses Respirators, Ear Plugs
Teaching Associate	Job specific
Warehouse Worker	Gloves, Safety Glasses, Hard hat

ACTIVITY	PPE SUGGESTED
Asbestos Removal	Gloves, Safety Glasses Respirators, Safety Shoes
Athletics	Sports specific (i.e., helmets, chest protectors, goggles, etc.)
Biology Lab	Gloves, Safety Glasses, Respirators
Carpentry	Gloves, Safety Glasses, Respirators, Ear Plugs, Safety Shoes, Hard hat
Chemistry Lab	Gloves, Safety Glasses, Respirators
Cleaning	Gloves, Safety Glasses, Respirators
Computer Repair	Gloves, Safety Glasses
Construction	Gloves, Safety Glasses, Respirators, Ear Plugs, Safety Shoes, Hard hats
Construction Eqpt. Oper	Gloves, Safety Glasses, Safety Shoes, Hard hats
Custodial Services	Gloves, Safety Glasses, Safety Shoes
Driving	Job specific
Electrical Work	Gloves, Safety Glasses, Safety Shoes, Hard hats
Elevated Work	Gloves, Safety Glasses, Safety Shoes, Hard hats
Excavation-Trenching	Gloves, Safety Glasses, Ear Plugs, Safety Shoes, Hard hats
Facilities Services	Gloves, Safety Glasses, Safety Shoes
Fire Fighting	Gloves, Safety Glasses, Respirators, Clothing, Safety Shoes, Hard hats
Haz Mat Handling	Gloves, Safety Glasses, Respirators, Clothing, Safety Shoes
Interpreters	Job specific
Lab Work	Gloves, Safety Glasses, Respirators, Clothing
Landscape/Grounds	Gloves, Safety Glasses, Ear Plugs, Safety Shoes, Respirators, Hard hats
Laser Operations	Safety Glasses
Law Enforcement	Clothing, Job specific, Safety Shoes
Maintenance	Gloves, Safety Glasses, Respirators, Ear Plugs, Safety Shoes, Hard hats
Mechanical Services	Gloves, Safety Glasses, Respirators, Ear Plugs, Safety Shoes, Hard hat
Metal Working	Gloves, Safety Glasses, Face Shields, Respirators, Ear Plugs, Safety Shoes, Hard hats
Painting	Gloves, Safety Glasses, Respirators, Clothing, Safety Shoes, Hard hats
Plumbing	Gloves, Safety Glasses, Respirators, Safety Shoes, Hard hats
Rescue Work	Gloves, Safety Glasses, Respirators, Clothing, Ear Plugs, Safety Shoes, Hard hats
Roofing	Gloves, Safety Glasses, Safety Shoes, Hard hats
Science Instruction	Gloves, Safety Glasses, Respirators, Clothing
Set Construction	Gloves, Safety Glasses, Safety Shoes, Hard hats
Stone/Concrete Work	Gloves, Safety Glasses, Respirators, Ear Plugs, Safety Shoes, Hard hats
Tree Work	Gloves, Safety Glasses, Ear Plugs, Fall Protection, Safety Shoes, Hard hats
Vehicle Services	Gloves, Safety Glasses Respirators, Safety Shoes
Warehousing	Gloves, Safety Glasses, Safety Shoes, Hard hat
Window Cleaning	Job specific

BODY PART	PPE SUGGESTED
Ears	Ear Plugs, Ear Muffs, Head Sets
Eyes	Goggles, Visors, Face Shields, Sun Glasses, Safety Glasses
General Body	HazMat Suits, Diving Suit, Lab Apron, Coveralls, Lab Coat, Shoulder Pads
Head	Hard Hats, Helmets, Bump Caps
Hands	Gloves (specific to hazard)
Limbs	Coveralls, Long Sleeve Shirts, Safety Shoes, Gloves, Hard Hat
Respiratory	Respirators (air supplied, air purifying, canister), Filter Masks
Skin	Clothing, Protective creams/ointments

HAZARD	PPE SUGGESTED
Airborne Contaminants	masks, respirators, coveralls, skin cream
Electrical Current	gloves, non-metal hard hats, clothing
Excessive Heat	clothing, cooling suits
Excessive Sound	ear plugs, ear muffs, head sets
Falling Objects	hard hat, bump cap
Fire	gloves, clothing, boots
Flying Metal Chips	safety glasses, goggles, face shields, hats
Harmful Dust	masks, respirators, coveralls, skin cream
Harmful Light	safety glasses, goggles, dark lens glasses, laser glasses
Hazardous Material Handling	gloves, safety glasses, goggles, face shields, clothing, creams
Hot Materials	gloves, work shoes, clothing, safety glasses, face shields
Ionizing Radiation	masks, special clothing, respirators, gloves
Laser Light	special glasses, clothing
Machine nip-points	safety glasses, gloves
Moving Equipment	safety glasses, metatarsal protectors, hard hats
Non-Ionizing Radiation	safety goggles, clothing, respirators, masks, gloves
Open Flame	safety goggles, clothing, gloves
Rolling Stock	work boots, metatarsal protection
Sharp Objects	gloves, clothing
Sunlight	sunglasses, goggles, skin creams, clothing

3.7 Procurement

The department person responsible for purchasing PPE should be very specific when ordering PPE so that there is a balance of quality, work efficiency and safety with the cost of the item. The purchaser should select the protective equipment which ensures a level of protection greater than the minimum required to protect employees from the hazards. When cost effective, an inventory of approved PPE should be maintained.

3.8 Maintenance and Care

It is critical that all reusable PPE be kept clean and properly maintained in order to provide the protection intended. Cleaning is particularly important for eye and face protection where dirty or fogged lenses could impair vision. For the purposes of compliance with Section 3380(a) and (d), PPE should be inspected, cleaned, and maintained at regular intervals. It is also important to ensure that contaminated PPE which cannot be decontaminated is disposed of in a manner that protects employees from exposure to hazards. Defective or damaged personal protective equipment shall not be used.

3.9 Fitting

For PPE devices with adjustable features, adjustments should be made on an individual basis for a comfortable fit that will maintain the protective device in the proper position. Particular care should be taken in fitting devices for eye protection against dust and chemical splash to ensure that the devices are sealed to the face. In addition, proper fitting of a helmet is important to ensure that it will not fall off during work operations. In some cases a chin strap may be necessary to keep the helmet on an employee's head. Careful consideration must be given to comfort and fit because continued wearing of the device is more likely if it fits the wearer

3.10 Storage and Distribution

When feasible, PPE should be kept in a clean, dust free locker, cabinet or area so that it is easily accessible to whomever needs it. Some PPE devices will have storage considerations specified by the manufacturer.

The department should make all PPE readily available to employees requiring hazard protection. When possible, reusable PPE devices may be assigned to individuals.

3.11 Supervision & Enforcement

Department management is responsible for assuring each worker wears the appropriate PPE when exposed to hazards on the job. Any employee who fails to wear PPE, when required, may face disciplinary action.

4.0 Training Requirements

Effective dissemination of safety information lies at the very heart of a successful Injury and Illness Prevention Program. It is essential to provide training for employees concerning general safe work practices as well as specific instruction with respect to hazards unique to each employee's job assignment.

Training content is determined by the Department of Safety and Risk Management, as well as Department Management which is based upon observed hazards, type of equipment, Department need, and work requirements.

- Providing training from within the department as a part of academic programming, or
- Training provided by CSU-System, or
- Training provided by Cal Maritime SRM, or
- A training provider outside the University.

Note: All outside trainer venders are to be reviewed and content approved by SRM. The Department of Safety and Risk Management, in conjunction with various departments have developed training programs designed to meet general safe work practice requirements. These programs are elements of larger programs which service broad campus needs.

Each supervisor will assure workers know how to properly wear, adjust and maintain assigned PPE. Workers will demonstrate understanding of the proper use of assigned PPE.
The training must cover these elements:

- When PPE is necessary;
- What PPE is necessary;
- The proper care, maintenance, useful life and disposal of the PPE.
- Training will be documented.
- How to properly don, doff, adjust, and wear PPE;
- The limitations of the PPE, and;

Retraining may be necessary to maintain employee knowledge of working with tools or if a near-miss or injury has occurred.

Training is to be documented and kept in a readily accessible location by the Department designee for access reference as needed by Department Management, Department of Safety & Risk Management, or regulatory agency (e.g. CalOSHA). Submit the completed training roster of attendees to the Department of Safety & Risk Management.

Program Administrators are trained on their roles and responsibilities in the management/maintenance of the requirements and inspections outlined in this program.

Refer to Cal/OSHA Safety & Health Training and Instruction Requirements as outlined in Appendix C of the Injury Illness Prevention Program.

5.0 Document Control & Recordkeeping

Essential records, including those legally required for Workers' Compensation, insurance audits and government inspections will be maintained for as long as required. Individual Departments and/or Colleges will also keep records of steps taken to establish and maintain the Injury and Illness Prevention Program.
They must include:

- Records of scheduled and periodic inspections to identify unsafe conditions and work practices. The documentation includes the name of the person(s) conducting the inspection, the unsafe conditions and work practices identified, and the corrective action(s) taken. These records will be maintained for at least three years.
- Documentation of health and safety training for each employee. Specifically, employee name or other identifier, training dates, type(s) of training and the name of the training provider will be included. Records will be retained for at least three years. Standard forms for maintaining this information can be obtained from the Department of Safety and Risk Management.

Training records will be kept in each department and copies will be forwarded to the Department of Safety and Risk Management.

5.1 Evaluating the Appropriateness of Identified PPE

Each supervisor is responsible for periodically re-evaluating the selection and use of PPE in work areas under their control. The hazard assessment should be repeated when new hazards are identified or introduced into the workplace or at least every three (3) years.

Departments must maintain the following records as part of the hand and portable power tool safety program.

- Employee training records
- Specialized SOPs
- Manufacturer specifications/manuals
- Maintenance/service records

Record	Timeframe/Frequency	Location of Record	Retention Period*
PPE Safety Training-General	Initial, Annual Refresher for affected employees.	Document on Employee's Safety Training Checklist	3-Years
PPE Training-General	Post incident and/or process management change for affected employees.	Document on Employee's Safety Training Checklist	3-Years
PPE Safety Training-Equipment Specific	Initial, Annual Refresher for affected employees.	Document on Employee's Safety Training Checklist	3-Years
PPE Safety Training-Equipment Specific	Post incident and/or process management change for affected employees.	Document on Employee's Safety Training Checklist	3-Years

*Refer to the Injury Illness Prevention Program Document Retention Table and/or California State University Systemwide for more information.

Appendix A: Definitions

General Terms

ANSI:	American National Standards Institute
Authorized person:	Means a person approved or assigned by the employer to perform a specific type of duty or duties or to be at a specific location or locations at the jobsite.
Competent person:	A competent person is a person who is **capable** of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees. The competent person has the **authority** to impose prompt corrective measures to eliminate these hazards. *Examples:* • **Excavation** - Inspectors 1541 • **Fall Protection** Plan implementers & supervisors 1671.1 • **Lift Slab Construction** 1522.1
Confined Space:	Is a space that (1) is large enough and so configured that an employee can enter bodily, (2) has limited or restricted means for entry or exit (e.g., tanks, vessels, vaults, shafts, pits), and (3) is not designed for continuous occupancy.
Construction Manager:	Is the Cal Maritime employee responsible for the supervision and field management of day-to-day needs of a construction project. It may be a project superintendent, a craft supervisor, or a lead person.
Construction work:	For purposes of this section, "Construction work" means work for construction, alteration, and/or repair, including painting and decorating. Construction: is any combination of engineering, procurement, erection, installation, assembly, demolition, or fabrication used to create a new facility, or to alter, add to, rehabilitate, dismantle, or remove an existing facility. It also includes the alteration and repair (including dredging, excavating, and painting) of buildings, structures, or other real property, as well as any construction and excavation activities conducted as part of environmental remediation efforts.
Controlled Access Zone (CAZ)	Means an area in which certain work (e.g., overhand bricklaying) may take place without the use of guardrail systems, personal fall arrest systems, or safety net systems and access to the zone is controlled
Imminent Danger:	Is any condition or practice that could reasonably be expected to cause death or serious physical harm (permanent or prolonged impairment of the body or temporary disablement requiring hospitalization) to employees or the public unless immediate actions are taken.
Project Manager:	Is the Cal Maritime employee representative with overall responsibility for a project. This person ensures subcontractor compliance with subcontract documents, including performance, schedule, budget, and safety.
Shall:	Means mandatory
Should:	Means recommended
Subcontractor:	Is a firm that has sole contractual responsibility for execution of the construction work related to a project, and for compliance with all safety, health, and environmental codes, standards, and regulations.
Qualified Person:	A qualified person is a person **designated** by the employer; and by reason of **training**, experience, or instruction has demonstrated the ability to perform safely all assigned duties; &, when required is properly licensed in accordance with federal, state, or local laws and regulations. Examples: • Mobile Crane & Tower **Crane** Operators 5006.1(a) • **Scaffold** Erection & Dismantling Supervisors 1637(k)(1) • **Demolition** 1736 • **Personal Fall Arrest** System supervisors 1670(b)

Definitions (cont.)

PPE-Specific

Airborne contaminants:	a harmful, irritating, or nuisance material, in the form of gas, dust/particulate, mist, or fumes, that is foreign to the normal atmosphere.
Clothing:	refers to whatever may be worn by the employee as protection for any body part.
Combination of hazards:	a workplace situation where more than one hazard is present concurrently, such as exposure to non-ionizing radiation, toxic gasses and flying hot particles when welding,
Excessive heat/flame:	working conditions that create the possibility that heat illness could occur, including air temperature, relative humidity, radiant heat from the sun and other sources, conductive heat sources such as the ground, air movement, workload severity and duration, protective clothing and personal protective equipment worn by employees.
Excessive sound:	exposure to an 8-hour time weighted average (TWA) noise level of 85 dBA or greater as measured on A scale of a sound level meter. Impulsive or impact noise should not exceed 140 dB peak sound pressure level.
Flying chips:	exposure to particulate material ejected by mechanical processes (e.g., wood sawing, metal grinding, paint spraying) or wind-blown dust.
Harmful light:	Any exposure to high energy laser light or other high intensity natural or artificial light that may cause damage to eye structures. Moderate and high-power lasers are potentially hazardous because they can burn the retina of the eye, or even the skin
Harmful radiation:	The level or dose of ionizing radiation or non-ionizing radiation that may cause biological damage if exposed. The ionizing radiation category primarily includes alpha, beta, x-ray, and gamma radiation. Non-ionizing radiation includes, among others, ultraviolet (UV), infrared (IR), radio frequency (RF), and microwave radiation. The difference between the two is that ionizing radiation has enough energy to eject orbital electrons from the atoms of the material being irradiated.
Hazardous materials:	Any material which poses a health and safety threat to employees and/or students or a threat to the environment as a result of improper handling, disposal methods or accidental discharge is considered hazardous.
Hazardous motion:	machinery or processes where any movement of tools, machine elements or particles exists, or movement of personnel that could result in collision with stationary objects.
Personal protective equipment:	Any device or system of clothing and devices that protects the wearer from the obvious harmful substances, activities, conditions or environment at the workplace.
Respirator:	a device designed to protect the wearer from the inhalation of harmful atmospheres.
Sharp objects:	Any object used or encountered that can be reasonably anticipated to penetrate the skin or any other part of the body, and to result in an exposure incident, including, but not limited to, needle devices, scalpels, lancets, broken glass, broken capillary tubes, exposed ends of dental wires, knives, drills and burrs.

Definitions (cont.)

Hazardous Materials-

Hazardous materials may be described using the following characteristics or regulatory definitions. This list is to be used as a guideline and allows for some laboratory/ technical areas to be classified as non-hazardous materials areas. It does not supersede Cal/OSHA regulations or accepted safe work practices for specific materials.
The container label and the Safety Data Sheet for the material should be consulted to determine the hazard classification(s) of a particular substance.

1	Corrosives. Any chemical that causes visible destruction of, or irreversible alterations in, living tissue at the site of contact	*Examples: hydrochloric acid, sulfuric acid, sodium hydroxides, potassium hydroxides.*
2	Materials recognized as readily absorbed through the skin	*Examples: phenol, THF, DMSO, benzene, carbon disulfide, toluene.*
3	Skin or eye irritants are chemicals which are not corrosive, but which cause a reversible inflammatory effect on living tissue by chemical action at the site of contact	*Examples: xylenes, formamide, many amines like triethanolamine, carbon tetrachloride, perchloroethylene, many inorganic salts like cobalt and nickel sulfate.*
4	Flammable liquids having a flash point not more than 93°C	*Examples: organic solvents, ethers, alcohols, toluene, pentane, acetone*.
5	Violently air-reactive or water-reactive chemicals, including pyrophorics (substances that spontaneously ignite in air)	*Examples: sodium or potassium metal, diethyl zinc, lithium aluminum hydride, t-butyl lithium, aluminum alkyls, calcium carbide, phosphine.*
6	Carcinogens or Mutagens.	*Examples: formaldehyde, dichloromethane, benzene, chloroform.*
7	Reproductive Hazards.	*Examples: acrylamide, Cd, Pb, Hg, Cr(VI), carbon disulfide, toluene, chloroform, ethylene glycol ethers*.
8	Toxic or Highly Toxic Chemical	A material likely to be fatal or toxic if inhaled, ingested or by skin contact.
9	Oxidizing Agents. A material not necessarily combustible, but may, generally by yielding oxygen, cause or contribute to the combustion of other material	*Examples: nitric and perchloric acids, chromates, nitrates, nitrites, hydrogen peroxide, chlorates.*

Appendix B: Job Hazard Analysis Template-Sample

SAFETY GUIDELINES		
IMAGE	**SCOPE OF WORK/EQUIPMENT USE**	**DEPARTMENT:**

HAZARD POTENTIAL EVALUATION

☐Struck By ☐Struck Against ☐Slip/Trip/Fall ☐Caught In/Between ☐Material Handling ☐Equipment Operating	☐Weather Conditions ☐Hazardous Substance ☐Electrical Hazards ☐Obstruction

SRM-HIRAC	1	2	3	4

TRAINING REQUIREMENTS

DO NOT use this equipmentunless an instructor or shop supervisor has instructed you in the safe use and operation and has authorized you to operate this equipment.

❑ IIPP	❑ Dept. Specific	❑ Operators/Owner's Manual	❑ Other:

PERSONAL PROTECIVE EQUIPMENT

 Eye Protection	 Foot Protection	 Hand Protection	 Hearing Protection	 Body Protection	 Head Protection	 Respiratory Protection	 Fall Protection	 Face Shield	 OTHER
When exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation...	When working in areas where there is a danger of foot injuries due to falling or rolling objects, or objects piercing the sole, or will protect the affected	When hands are exposed to hazards such as those from skin absorption of harmful substances; severe cuts or lacerations; severe abrasions; punctures; chemical burns	When exposed to a time weighted average noise level of 85 dBA or higher over an 8 hour work shift.	When exposure to: Intense heat, hot metals, other hot liquids Impacts from materials that can cut, burn Hazardous chemicals Or potentially infectious materials	Where there is a potential for injury to the head from falling objects and/or when there is a risk of impact to head	May be required if removal of contaminants from the air does not fall below permissible exposure level.	When there is a risk of falling from a height greater than 4ft GSO 6ft CSO 6ft MSO When working in confined space	Face shield can be used over the glasses if there is a presence of a lot of flying debris.	

HAZARDS		HAZARD CONTROLS & PROTECTION MEASURES

IF CONDITIONS CHANGE: STOP WORK IMMEDIATELY-REVIEW WITH SUPERVISOR-DOCUMENT HAZARD-REVIEW WITH SRM

SAFE OPERATING PROCEEDURES				
	STEPS/TASKS	HAZARD POTENTIAL		HAZARD CONTROLS & PROTECTION MEASURES
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

NOTES

IF CONDITIONS CHANGE: STOP WORK IMMEDIATELY-REVIEW WITH SUPERVISOR-DOCUMENT HAZARD-REVIEW WITH SRM

EMERGENCY RESPONSE			EVACAUTION ASSEMBLY POINT
1	First Aid Kit		
2	AED		
3	Emergency phone	Campus Police- 707-654-1111 or 911	

REMINDER: IMMEDIATELY REPORT ALL INCIDENTS, REGARDLESS OF SEVERITY, TO YOUR SUPERVISOR AND THE DEPARTMENT OF SAFETY & RISK MANAGEMENT.

HOUSEKEEPING & SECURITY		SHOP SUPERVISOR MUST BE PRESENT WHEN SHOP IS OCCUPIED
1	Is the work area/site Clean?	Ensure work area is clean daily and that any hazardous materials are properly disposed of daily
2	Is the work area/site Secure?	Ensure lights are turned off and building is locked upon exiting work for the day.
3		

Appendix C: Personal Protective Equipment Hazard Assessment Form

EYES

Work Activities	Work-Related Exposures	Personal Protective Equipment
❑ Abrasive Blasting ❑ Chopping Cutting ❑ Drilling Grinding ❑ Hammering ❑ Janitorial ❑ Landscape maintenance ❑ Sanding Sawing Welding ❑ Other _____	❑ Airborne dust ❑ Flying particles ❑ Blood splashes ❑ Hazardous liquid chemicals ❑ Intense light ❑ Other _____	Can hazard be eliminated without the use of PPE? YES_____NO_____ If No, use: ❑ Safety glasses w/side shields ❑ Safety goggles ❑ Shading/filter # _____ ❑ Dust tight goggles ❑ Welding shield ❑ Other _____

FACE

Work Activities	Work-Related Exposures	Personal Protective Equipment
❑ Food prep ❑ Janitorial ❑ Mixing Painting ❑ Solvent cleaning ❑ Welding ❑ Other _____	❑ Extreme heat/cold ❑ Hazardous liquid chemicals ❑ Potential irritants_____ ❑ Other _____	Can hazard be eliminated without the use of PPE? YES_____NO_____ If No, use: ❑ Face Shield ❑ Shading/filter # _____ ❑ Welding shield ❑ Other _____

HEAD

Work Activities	Work-Related Exposures	Personal Protective Equipment
❑ Building maintenance ❑ Confined space operations ❑ Construction ❑ Road work ❑ Electrical wiring ❑ Walking/working under catwalk ❑ Walking/working under crane loads ❑ Utility work ❑ Other	❑ Beams ❑ Pipes ❑ Exposed electrical wiring or components ❑ Falling objects ❑ Machine parts ❑ Other _____	Can hazard be eliminated without the use of PPE? YES_____NO_____ If No, use: Protective Helmet: ❑ Flying/falling objects, no electrical contact Electrical contact (<600 V)- ❑ Electrical contact (>600V) ❑ Bump Cap *(not ANSI approved)*

HANDS & ARMS

Work Activities	Work-Related Exposures	Personal Protective Equipment
❑ Building maintenance ❑ Computer use ❑ Food Preparation ❑ Grinding Hammering ❑ Health Care Services ❑ Janitorial ❑ Knife use ❑ Landscape maintenance ❑ Material Handling Sanding ❑ Sawing ❑ Welding ❑ Working with glass Other _____	❑ Biological hazard (poisonous vegetation, insects, etc.) ❑ Blood ❑ Extreme heat/cold ❑ Irritating chemicals ❑ Scrape, bruise or cut by tools or materials ❑ Other	Can hazard be eliminated without the use of PPE? YES_____NO_____ If No, use: ❑ Gloves: ❑ Chemical resistant ❑ Liquid/leak resistant ❑ Temperature resistant ❑ Abrasion/cut resistant ❑ Slip resistant ❑ Protective sleeves ❑ Other

FEET & LEGS		
Work Activities	**Work-Related Exposures**	**Personal Protective Equipment**
❑ Building maintenance ❑ Construction ❑ Road work ❑ Demolition ❑ Janitorial ❑ Landscape maintenance ❑ Plumbing Trenching ❑ Use of flammable materials ❑ Welding ❑ Other _____	❑ Explosive atmospheres ❑ Exposed electrical wiring or components ❑ Heavy equipment ❑ Slippery surfaces Tools ❑ Other _____	Can hazard be eliminated without the use of PPE? YES_____NO_____ If No, use: Safety shoes or boots Anti-slip soles Chemical resistant Electrical protection Heat/cold protection Metatarsal protection Puncture resistance Toe Protection Leggings Chaps Foot-leg guards Other ___
BODY-SKIN		
Work Activities	**Work-Related Exposures**	**Personal Protective Equipment**
❑ Food preparation ❑ Battery charging ❑ Solvent cleaning Sawing ❑ Other_____	❑ Chemical splashes ❑ Extreme heat/cold ❑ Sharp or rough edges ❑ Other _____	Can hazard be eliminated without the use of PPE? YES_____NO_____ If No, use: ❑ Apron Body suit Coveralls Vest, jacket ❑ Rain gear Welding leathers Other ____
RESPIRATORY PROTECTION		
Work Activities	**Work-Related Exposures**	**Personal Protective Equipment**
❑ Sanding/grinding ❑ Painting ❑ Soldering/welding ❑ Chemical handling ❑ Caustic handling Sweeping/dusting ❑ Leaf blowing Solvent cleaning Sawing/milling ❑ Other _____	❑ Nuisance dust (non-hazardous) Hazardous dust/particulates Vapors ❑ Metal fumes ❑ Other _____	Can hazard be eliminated without the use of PPE? YES_____NO_____ If no, is voluntary use of N95 or R95 filtering face piece possible? YES_____NO_____ If No, : Contact EHS
HEARING PROTECTION		
Work Activities	**Work-Related Exposures**	**Personal Protective Equipment**
❑ Power tools ❑ Pneumatic tools ❑ Equipment chase access ❑ Landscape equipment ❑ Other _____	❑ Continuous noise ❑ Intermittent loud noises ❑ Other _	Can hazard be eliminated without the use of PPE? YES_____NO_____ If No, use: ❑ Earplugs ❑ Ear canals ❑ Earmuffs ❑ Custom earplugs

Appendix D: Laboratory Hazard Assessment Tool (non-mandatory)

This Laboratory Hazard Assessment Tool (LHAT) facilitates the identification of hazards and appropriate Personal Protective Equipment (PPE) to ensure the safety of lab personnel during work activities. The LHAT must be updated as hazards and personnel change, and at least once every 12 months, irrespective of changes to hazards or personnel.

The process is as follows:

1. Lab Personnel – Identify all lab personnel associated with the PI. This includes researchers, post-docs, graduate students, lab helpers, undergraduates and volunteers. Begin the LHAT with this step
2. Attend PPE Distribution Event with receipt of LHAT completion and type(s) PPE needed for individual
3. Fit PPE @ Event
4. Issue PPE @ Event
5. Training and Documentation of Training

What is a Lab Group?

Most PIs create a separate Lab Group for each lab they oversee. However, Lab Groups are designed to be flexible to allow PIs to create them in a manner that is intuitive to them. Please note that an LHAT Survey must be completed for each Lab Group created.

This tool is based on a model developed and used at the Cal Maritime campus.

This form must be completed by the PI, Lab Manager, or their designee at least once each calendar year to conduct an activity hazard assessment specific to activities in their laboratories. The Activity Hazard Assessment identifies hazards to employees and specifies personal protective equipment (PPE) to protect employees during work activities. The person(s) conducting the assessment must verify that it is complete and that training has been conducted.

SRM personnel are available to assist you with completing your Activity Hazard Assessment form or with reviewing it after you've completed it. SRM may also be consulted for specific questions regarding PPE requirements.

Activity Hazard Assessment

In this section, you will:
- Conduct a hazard assessment of this lab group to identify activities when PPE is needed to protect the lab personnel;
- Certify the hazard assessment for the laboratory.

Note: In all cases chemical splash goggles can be substituted for safety glasses. For splash or impact protection, either safety goggles or safety glasses respectively need to be worn under face shields.
The final assessment report will identify PPE applicable to each hazard identified in the lab. **For activities that are described in a laboratory specific SOP or for activities where a Use Authorization(s) (UA) has been issued by a campus safety committee, the PPE specified in that SOP/UA shall take precedence.**

Activity performed		All Laboratories ❑ Laboratory has been approved and posted as free of physical or chemical hazards. Skip all other sections			
Yes	**No**	**Activity in lab**	**Potential Hazard**	**Active Researcher PPE (Direct Manipulation)**	**Adjacent Individuals PPE**
☐	☐	Entering laboratory	Many- Slip, trip, fall	✓ Long pants or equivalent ✓ Closed-toed/heel shoes ✓ Long hair tied back Note: Tights & panty hose are considered undergarments	All personnel in laboratory room: Long Pants Closed toed/heel shoes
☐	☐			✓	✓
☐	☐			✓	✓

Under University Policy full length pants (or equivalent), and closed toe/heel shoe attire must be worn at all times by all individuals who are occupying or entering a laboratory/technical area.

Activity performed		Chemical Hazards			
Yes	**No**	**Activity in lab**	**Potential Hazard**	**Active Researcher PPE (Direct Manipulation)**	**Adjacent Individuals PPE**
☐	☐	Working with small volumes of corrosive (e.g. acids, caustics, etc.) liquids or solids.	Eye or skin damage. Low probability for a splash hazard.	✓ Safety glasses ✓ Chemical-resistant gloves ✓ Lab coat	In adjacent area within meters: ✓ Safety glasses ✓ Lab coat
☐	☐	Working with corrosive or acutely toxic liquids or other materials which creates a splash hazard.	Poisoning, increased potential for eye and skin damage.	✓ Safety goggles ✓ Chemical-resistant gloves ✓ Lab coat and ✓ Chemical-resistant apron	In adjacent area within ____meters: ✓ Safety glasses ✓ Lab coat
☐	☐	Working with small volumes of flammable solvents/materials when no reasonable ignition sources are present.	Skin or eye damage, potential poisoning through skin contact.	✓ Safety glasses ✓ Chemical-resistant gloves ✓ Lab coat	In adjacent area within meters: ✓ Safety glasses ✓ Lab coat
☐	☐	Working with flammable materials (including solvents): When using a large quantity; or, any quantity when there is a risk of ignition; or, areas where flammable vapors or gas are may be present.	Major Fire. Major skin or eye damage, potential poisoning through skin contact.	✓ Safety glasses ✓ Flame-Resistant (FR) outer gloves ✓ Chemical-resistant inner gloves ✓ NFPA 2112 rated Flame-Resistant (**FR) lab coat**	All personnel in laboratory room: ✓ Safety glasses ✓ NFPA 2112 rated Flame- Resistant (FR) lab coat
☐	☐	Working with toxic or hazardous chemicals (solid, liquid, or gas).	Skin or eye damage, potential poisoning through skin contact.	✓ Safety glasses (chemical splash goggles for large quantities) ✓ Chemical-resistant gloves ✓ Lab coat	In adjacent area within meters. ____ ✓ Safety glasses ✓ Lab coat
☐	☐	Working with Acutely Toxic Chemicals.	Spills, splashes, ingestion, inhalation, absorption. Chemicals pose a high level of immediate health risk.	✓ Safety glasses ✓ Chemical resistant gloves ✓ Lab coat (plus chemical protective apron for H330)	All personnel in laboratory room: ✓ Safety glasses ✓ Lab coat
☐	☐	Working with an apparatus with contents under pressure or vacuum.	Eye or skin damage.	✓ Safety glasses ✓ Face shield (for high risk activities) ✓ Chemical-resistant gloves ✓ Lab coat ✓ Chemical-resistant apron (for high risk activities)	In adjacent area within ____meters. ✓ Safety glasses ✓ Lab coat

Activity performed		Chemical Hazards			
Yes	**No**	**Activity in lab**	**Potential Hazard**	**Active Researcher PPE (Direct Manipulation)**	**Adjacent Individuals PPE**
☐	☐	Working with pyrophoric (air reactive) chemicals or chemicals that in contact with water releases flammable gasses (water reactive).	Severe skin and eye damage. Fire.	For work outside glove boxes: ✓ Safety glasses ✓ Face shield ✓ FR rated outer gloves ✓ Chemical-resistant inner gloves ✓ NFPA 2112 Flame Resistant **(FR) lab coat.** Work in inert atmosphere when possible.	All personnel in laboratory room: ✓ Safety glasses ✓ NFPA 2112 Flame Resistant (FR) lab coat
☐	☐	Working with potentially explosive chemicals. (e.g. Nitrates, Perchlorates, Nitrites etc.)	Splash, detonation, flying debris, skin and eye damage, fire.	✓ Safety glasses ✓ Face shield, and/or use blast shield ✓ Chemical-resistant gloves ✓ **NFPA 2112 Flame Resistant (FR) lab coat**	All personnel in laboratory room: ✓ Safety glasses (or goggles) ✓ NFPA 2112 Flame Resistant (FR) lab coat
☐	☐	Minor chemical spill cleanup	Skin or eye damage, respiratory damage.	✓ Safety glasses ✓ Chemical-resistant gloves ✓ Shoe covers ✓ Chemical-resistant apron ✓ Lab coat	In adjacent area within meters: ✓ Safety glasses ✓ Lab coat
☐	☐	Major chemical spill cleanup	Multiple hazards.	Call for EH&S assistance	All personal evacuate lab
☐	☐	Working with known or suspect human carcinogens	Spills, splashes, ingestion, inhalation, absorption. High hazard cancer-causing agents.	✓ Safety glasses ✓ Chemical-resistant gloves ✓ Lab coat	In adjacent area within meters: ✓ Safety glasses ✓ Lab coat
☐	☐	Working with reproductive hazards	Spills, splashes, ingestion, inhalation, absorption. Agents that affect reproductive capabilities, cause mutation and adversely affect fetal development.	✓ Safety glasses ✓ Chemical-resistant gloves ✓ Lab coat	In adjacent area within meters: ✓ Safety glasses ✓ Lab coat
☐	☐	Working with engineered nanomaterials.	Inhalation, exposure, dermal exposure.	✓ Chemical Splash goggles ✓ Chemical-resistant gloves ✓ Lab coat	All personnel in laboratory room: ✓ Safety glasses ✓ Lab coat

Activity performed		Physical Hazards			
Yes	**No**	**Activity in lab**	**Potential Hazard**	**Active Researcher PPE (Direct Manipulation)**	**Adjacent Individuals PPE**
☐	☐	Working with cryogenic liquids.	Major skin, tissue, or eye damage.	✓ Safety glasses (goggles for large volumes) ✓ Face shield ✓ Cryogenic protective gloves ✓ Lab coat	N/A
☐	☐	Removing freezer vials from liquid nitrogen.	Vials may explode upon rapid warming. Cuts to face/neck and frostbite to hands.	✓ Safety glasses ✓ Face shield ✓ Cryogenic protective gloves ✓ Lab coat	N/A
☐	☐	Working with very cold equipment or dry ice.	Frostbite, hypothermia.	✓ Safety glasses ✓ Cryogenic protective gloves ✓ Lab coat (possibly warm clothing)	N/A
☐	☐	Working with scalding liquids or hot equipment (e.g. autoclave, water bath, oil bath).	Burns resulting in skin or eye damage.	✓ Safety glasses (goggles for large volumes) ✓ Thermal protective gloves (impermeable insulated gloves for liquids and steam) ✓ Lab coat	N/A
☐	☐	Glassware washing.	Lacerations, chemical splash.	✓ Safety glasses ✓ Heavy rubber gloves ✓ Lab coat	N/A
☐	☐	Working with loud equipment, noises, sounds, alarms, etc.	Potential ear damage and hearing loss.	✓ Earplugs or ear muffs as necessary	✓ Earplugs or ear muffs as necessary
☐	☐	Working with a centrifuge.	Imbalanced rotor can lead to broken vials, cuts, exposure.	✓ Safety glasses ✓ Disposable gloves ✓ Lab coat	N/A
☐	☐	Working with sharps (e.g. needles and razor blades.)	Cuts, exposure.	✓ Safety glasses ✓ Cut resistance gloves ✓ Lab coat	N/A

Activity performed		Biological Hazards			
Yes	**No**	**Activity in lab**	**Potential Hazard**	**Active Researcher PPE (Direct Manipulation)**	**Adjacent Individuals PPE**
☐	☐	Working with human or non- human primate blood, body fluids, tissues, cells or other potentially infectious material (OPIM) which may contain human blood borne pathogens (BBP).	Exposure to infectious material, sharps injuries.	✓ Eye and mucous membrane protection (as appropriate for operations) ✓ Disposable gloves ✓ Disposable lab coat impervious to fluids	In adjacent area within ___meters: ✓ Safety glasses ✓ Lab coat
☐	☐	Working with microbial agents (bacteria, virus, parasites, yeast, fungi, prions), recombinant DNA and/ or biological materials (cells, tissues, fluids) exposed to or likely to contain Risk Group 1 microbial agents or recombinant DNA.	Eye irritation, sharps injury. Exposure of infectious material to those who may have personal health issues which make them more susceptible to infection; cross contamination of animal or extra laboratory areas.	✓ Safety glasses ✓ Disposable gloves ✓ Lab coat	In adjacent area within ___meters: ✓ Safety glasses ✓ Lab coat
☐	☐	Working with microbial agents, recombinant DNA and/or biological materials (cells, tissues, fluids) exposed to or likely to contain Risk Group 2 microbial agents or recombinant DNA.	Exposure to infectious material, particularly through broken skin or mucous membranes, sharps injuries.	✓ Safety glasses ✓ Double layer of disposable gloves ✓ Lab coat	All personnel in laboratory room: ✓ Safety glasses ✓ Lab coat.
☐	☐	Working microbial agents, recombinant DNA and/or biological materials (cells, tissues, fluids) exposed to or likely to contain Risk Group 2 microbial agents or recombinant DNA for which Biosafety Level 3 practices are required.	Exposure to infectious materials with high risk of exposure by contact with skin or mucous membranes and/ other potential or unknown routs of entry and or increased consequences of exposure. Sharps injuries.	✓ Safety glasses ✓ Double layer disposable gloves ✓ Lab coat or disposable lab coat	All personnel in laboratory room: ✓ Safety glasses ✓ Lab coat or disposable lab coat.

Activity performed		Biological Hazards			
Yes	**No**	**Activity in lab**	**Potential Hazard**	**Active Researcher PPE (Direct Manipulation)**	**Adjacent Individuals PPE**
☐	☐	Working with microbial agents, recombinant DNA and/or biological materials (cells, tissues, fluids) exposed to or likely to contain Risk Group 3 microbial agents or recombinant DNA.	Exposure to infectious materials with high risk of exposure, particularly through the inhalation route.	✓ Safety glasses ✓ Double layer disposable gloves ✓ Shoe cover or dedicated shoe ✓ Full back closing disposable gown or coveralls (preferred)	All personnel in laboratory room: ✓ Safety glasses ✓ Double layer disposable gloves ✓ Shoe cover or dedicated shoe ✓ Full back closing disposable gown or coveralls (preferred)
☐	☐	Working with live animals- alone or in conjunction with Risk Group 1 microbial agents or recombinant DNA.	Animal bites, allergies, eye irritation, sharps injury. Exposure of infectious material to those who may have personal health issues which make them more susceptible to infection; cross contamination of animal or extra laboratory areas.	✓ Safety glasses ✓ Disposable gloves ✓ Lab coat Additional PPE (e.g. puncture resistant gloves) may be required based on risk assessment. Additional gowning (shoe covers, face mask) may be required for animal welfare purposes.	All personnel in laboratory room: ✓ Safety glasses ✓ Lab coat
☐	☐	Working infected or potentially infectious live animals—alone or in conjunction with Risk Group 2 microbial agents or recombinant DNA (or materials exposed to RG-2 agents).	Animal bites, exposure to infectious material, allergies, sharps injury.	✓ Safety glasses ✓ Disposable gloves ✓ Bouffant ✓ Lab coat Additional PPE (e.g. puncture resistant gloves) may be required based on risk assessment. Additional gowning (shoe covers, face mask) may be required for animal welfare purposes.	All personnel in laboratory room: ✓ Safety glasses ✓ Bouffant ✓ Lab coat

Activity performed		Radiological Hazards I have a RUA and/or MUA that addresses all these. Skip to next section.			
Yes	**No**	**Activity in lab**	**Potential Hazard**	**Active Researcher PPE (Direct Manipulation)**	**Adjacent Individuals PPE**
☐	☐	Working with unsealed radioactive materials including generally licensed radioactive material or devices (e.g., uranyl acetate, uranyl nitrate, thorium, nitrate).	Cell damage, potential spread of radioactive materials.	✓ Safety glasses ✓ Impermeable gloves or chemical resistant gloves ✓ Lab coat	In adjacent area of _meters. ✓ Safety glasses ✓ Lab coat
☐	☐	Working with unsealed radioactive materials in hazardous chemicals (corrosives, flammables, liquids, powders, etc.).	Cell damage or spread of contamination plus hazards for the specific chemical.	✓ Safety glasses (goggles for splash hazard) ✓ Chemical-resistant gloves ✓ Lab coat *Note: Select gloves for applicable chemical hazards above.*	In adjacent area of _meters. ✓ Safety glasses ✓ Lab coat
☐	☐	Working with radioactive sealed sources or devices containing sources of radioactive materials (e.g., liquid scintillation counters, gas c hromatographs/electron capture detectors, static eliminators, etc.)	If sealed source is compromised due to removal from equipment or physical abuse: cell damage, potential spread of radioactive materials.	PPE is not necessary under normal operating instructions. *Note: Source may not be removed form device except by SRM or manufacturer.*	N/A

Activity performed		Non ionizing Radiation Hazards			
Yes	**No**	**Activity in lab**	**Potential Hazard**	**Active Researcher PPE (Direct Manipulation)**	**Adjacent Individuals PPE**
☐	☐	Working with ultraviolet radiation.	Conjunctivitis, corneal damage, skin redness.	✓ UV face-shield with correct OD value ✓ Opaque gloves ✓ Lab coat	In adjacent area within ___meters with direct line of sight. ✓ UV face-shield with correct OD value ✓ Lab coat
☐	☐	Working with infrared emitting equipment (e.g. glass blowing).	Cataracts, burns to cornea.	✓ Appropriate shaded glasses ✓ Lab coat	In adjacent area within ___meters with direct line of sight. ✓ Appropriate shaded glasses ✓ Lab coat

Activity performed		Non ionizing Radiation Hazards			
Yes	**No**	**Activity in lab**	**Potential Hazard**	**Active Researcher PPE (Direct Manipulation)**	**Adjacent Individuals PPE**
☐	☐	Open Beam- Performing alignment, trouble-shooting or maintenance that requires working with an open beam and/or defeating the interlock (s) on any Class 3 or Class 4 laser system.	Eye damage	✓ Appropriate protective eyewear, wavelength and optical density based on individual beam parameters.	All personnel in laser use room: ✓ Appropriate protective eyewear, wavelength and optical density based on individual beam parameters.
☐	☐	Open Beam- Viewing a Class 3R laser beam with magnifying optics.	Eye damage	✓ Appropriate protective eyewear, wavelength and optical density based on individual beam parameters.	N/A
☐	☐	Open Beam- Working with a Class 3B laser open beam system with the potential for producing direct or specular reflections.	Eye damage	✓ Appropriate protective eyewear, wavelength and optical density based on individual beam parameters.	All personnel in laser use room: ✓ Appropriate protective eyewear, wavelength and optical density based on individual beam parameters. Appropriate skin protection.
☐	☐	Open Beam- Working with a Class 4 laser open beam system with the potential for producing direct, specular or diffuse reflections.	Eye damage, skin damage	✓ Appropriate protective eyewear, wavelength and optical density based on individual beam parameters. ✓ Appropriate skin protection.	All personnel in laser use room: ✓ Appropriate protective eyewear, wavelength and optical density based on individual beam parameters. Appropriate skin protection.
☐	☐	Non-Beam - Handling dye laser materials, such as powdered dyes, chemicals, and solvents.	Cancer, explosion, fire.	✓ Gloves, safety glasses, flame-resistant lab coat or coveralls.	In adjacent area within ___ meters. ✓ Safety glasses ✓ Lab coat

Activity performed		Non ionizing Radiation Hazards			
Yes	**No**	**Activity in lab**	**Potential Hazard**	**Active Researcher PPE (Direct Manipulation)**	**Adjacent Individuals PPE**
☐	☐	Non-Beam- Maintaining and repairing power sources for large Class 3B and Class 4 laser.	Electrocution, explosion fire	✓ Electrical isolation mat, ✓ Flame-Resistant NEC 70E APC rated lab coat or coveralls.	N/A
☐	☐	Enclosed Beam- Using a Class 1 device housing a Class 3B or Class 4 enclosed or embedded laser with the potential for beam exposure during a Service Event.	Eye damage, skin damage	✓ Appropriate protective eyewear, wave length and optical density based on individual beam parameters, appropriate skin protection.	All personnel in laser use room: ✓ Appropriate protective eyewear, wavelength and optical density based on individual beam parameters. Appropriate skin protection.

Activity performed		Unique or Lab Specific Activities If your lab conducts any additional or unique activities that are not listed above, identify the potential hazards and appropriate PPE then add these activities to the table below. If a lab activity is similar to but somewhat different than one of the common activities			
Yes	**No**	**Activity in lab**	**Potential Hazard**	**Active Researcher PPE (Direct Manipulation)**	**Adjacent Individuals PPE**
☐	☐			✓	✓
☐	☐			✓	✓
☐	☐			✓	✓
☐	☐			✓	✓
☐	☐			✓	✓
☐	☐			✓	✓

Appendix E: Guideline for Selecting PPE

This supplement has been developed to assist in the appropriate selection of Personal Protective Equipment (PPE) for protection from those hazards determined from conducting a PPE Hazard Assessment of a work area or process. The protective device should be selected to fit the job, and the employee should become acquainted with the limitations of the device.

NOTE:

- All personal protective equipment must be approved (ANSI, NIOSH, etc.) for the work to be performed, properly fit each user, not be defective or damaged, be appropriate and properly maintained even if an employee provides his/her own protective equipment, and be used by trained employees.
- Each employee required to use PPE must know when PPE is necessary, what PPE is necessary, how to properly don, doff, adjust, and wear PPE, the limitations of the PPE, and the proper care, maintenance, useful life and disposal of the PPE.
- Contact EH&S for assistance if necessary.

Selecting Chemical Resistant Gloves

Glove Material	Intended Use	Advantages and Disadvantages
Latex (natural rubber)	Incidental contact	▪ Good for biological and water-based materials ▪ Poor for organic solvents ▪ Little chemical protection ▪ Hard to detect puncture holes ▪ Can cause or trigger latex allergies
Kevlar	Specific Use	▪ Good for cut resistance* ▪ Good for flame resistance* ▪ Good for reusability ▪ No chemical protection
Nitrile	Incidental contact	▪ Good for solvents, oils, greases, and some acids and bases ▪ Clear indication of tears and breaks ▪ Good alternative for those with latex allergies
Butyl rubber	Extended contact	▪ Good for ketones and esters ▪ Poor for gasoline and aliphatic, aromatic, and halogenated hydrocarbons
Neoprene	Extended contact	▪ Good for acids, bases, alcohols, fuels, peroxides, hydrocarbons, and phenols ▪ Poor for halogenated and aromatic hydrocarbons
Norfoil	Extended contact	▪ Good for most hazardous chemicals ▪ Poor fit (Note: Dexterity can be partially regained by using a heavier weight Nitrile glove over the Norfoil glove. Also, 4H brand gloves tend to provide better dexterity than the Silver Shield brand.)
Viton	Extended contact	▪ Good for chlorinated and aromatic solvents ▪ Good resistance to cuts and abrasions ▪ Poor for ketones
Polyvinyl chloride (PVC)	Specific use	▪ Good for acids, bases, oils, fats, peroxides, and amines ▪ Good resistance to abrasions ▪ Poor for most organic solvents
Polyvinyl alcohol (PVA)	Specific use	▪ Good for aromatic and chlorinated solvents ▪ Poor for water-based solutions

Source of Hazard	Affected Body Part	Recommended PPE
Chemical and Splashing Liquid (e.g., acid and chemical handling, hazardous drug preparation and administration, biological substances, food processing, painting, cleaning products, pesticide and herbicide use, etc.)	Eyes	Goggles, safety glasses with side shields (not for chemical protection)
	Head, Neck, Face	Chem-resistant Tyvek hood, face shield, chemical/liquid resistant hoods/caps, fluid-resistant surgical masks or surgical mask/face shield combinations (generally not for chemical protection)
	Feet and Toes	Slip-resistant shoes, chemical/liquid resistant overshoes
	Hands	Chosen based on specific hazard: Nitrile, butyl rubber, neoprene, Silver Shield, or other chemical resistant gloves or mittens, chemotherapy gloves
	Body: torso, arms, legs	Chemical/liquid resistant clothing
High Heat (dry) (e.g., Burns from hot surfaces, sparks, Bunsen burners, welding, kitchen equipment, furnace operations, etc.)	Eyes	Goggles, safety glasses with side shields, insulated helmets
	Head, Neck, Face	Face shield, flame retardant/insulated helmet, cap or hood
	Feet and Toes	Leather shoes, foundry shoes
	Hands	Hand protection made from insulated or flame resistant materials such as Nomex, Kevlar, leather, terry, cotton, etc.
	Body: torso, arms, legs	Clothing made from flame resistant or insulated material such as Nomex or leather
High Heat (liquid) (e.g., Burns from hot liquids, molten metal, steam, food preparation, etc.)	Eyes	Goggles, Safety glasses w/ side shields
	Head, Neck, Face	Face shields, protective hoods/helmets
	Feet and Toes	Leather shoes, foundry shoes
	Hands	Insulated gloves with added liquid resistant properties when necessary
	Body: torso, arms, legs	Clothing made from treated wool or cotton, leather or specialty fabrics such as Nomex
Cryogens/Extreme Cold (e.g., cryo-burns, frostbite, permanent eye damage from liquid nitrogen, CO_2, non- insulated equipment, etc.)	Eyes	Goggles
	Head, Neck, Face	Face shield
	Feet and Toes	Appropriate safety shoes
	Hands	Cryo-gloves
	Body: torso, arms, legs	Lab coat, long pants, aprons, insulated cotton or synthetic fabrics
Dust/Flying Debris (e.g., Chipping, grinding, sanding, chiseling, woodworking, grounds keeping, coal handling, buffing, general dusty conditions, etc.)	Eyes	Goggles, safety glasses w/ side protection
	Head, Neck, Face	Face shield, hard hat, helmet, hood
	Feet and Toes	Safety shoes if appropriate
	Hands	Appropriate protective gloves
	Body: torso, arms, legs	Protective clothing made from synthetic or natural fabrics such as Kevlar or treated cotton/wool, or cotton duck.

Source of Hazard	Affected Body Part	Recommended PPE
Impact/Compression (e.g., Crushing or penetration from machinery, rotating equipment, materials handling, carpentry, construction, etc.)	Eyes	Safety glasses w/ side shields
	Head, Neck, Face	Class G, E, or C helmets
	Feet and Toes	Safety toes and metatarsal guards
	Hands	Leather, Kevlar or other specialty material
	Body: torso, arms, legs	Leather, Kevlar or cotton duck clothing
UV/IR Radiation (e.g., Optical radiation from welding, cutting, torch brazing or soldering, glare, laser, working outdoors, etc.)	Eyes	Spectacles, welding face shield, goggles, or helmets with appropriate shaded or special purpose lenses.
	Head, Neck, Face	Same as above
	Feet and Toes	Closed-toe shoes
	Hands	Sunscreen
	Body: torso, arms, legs	Sunscreen; clothing with SPF rating
Electrical Hazards (e.g., Open circuits, energized electrical equipment or utilities, electrical arc, etc.)	Eyes	Safety glasses
	Head, Neck, Face	Hard hat, Class E
	Feet and Toes	Electrical hazard footwear
	Hands	Rubber gloves and insulating sleeves, Class 00-4 based on max. voltage exposure
	Body: torso, arms, legs	Garments made from Protera synthetic material, flame retardant clothing
Puncture/Cuts/Abrasions (e.g., Sharp edges from tools and machines, food preparation, surgical equipment, syringes, etc.)	Eyes	Safety glasses w/ side shields
	Head, Neck, Face	Face shield
	Feet and Toes	Safety toed and puncture resistant soles
	Hands	Material depends on specific hazard and severity, but can include leather, rubber, cotton, Kevlar, metal mesh, etc.
	Body: torso, arms, legs	Clothing made from Kevlar, treated wool or cotton, duck or leather.
Slippery/Wet Surfaces (e.g., Oil, water, soaps, wax, chemicals, food handling areas, etc.)	Feet and Toes	Slip resistant safety shoes
Fall Hazards (e.g., Unprotected elevated working surfaces)	Body	Personal fall arrest system
Noise (e.g., Mechanical rooms, machining, grinding, sanding, cage washing, dish washing, pneumatic equip., grounds equipment, generators, chillers, motors, saws, jackhammers, etc.)	Head, Neck, Face	Ear plugs, ear muffs, or canal caps
Respiratory (e.g., Emergency response, hazardous chemicals, powders, mists, vapors, smoke or gases, painting, welding, cutting, brazing, disturbing asbestos, lead, silica, or other particulate hazards, working with animals, entering fume hood plenums, grounds equipment, etc.)	Respiratory	Appropriate respirator can be a filtering facepiece (such as an N- 95), PAPR, half-mask air- purifying, full-face air-purifying, or supplied air (including SCBA) depending on the hazard; must be approved by OESO

Appendix F: Equipment Inventory

Equipment Inventory
Department **Instructions:** An initial inventory of Equipment owned/operated by each department must be conducted to identify all equipment impacted by this program. This must be done by physical inspection. At Cal Maritime this survey may be conducted by a responsible person in a department, the department's Designated Safety Coordinator (DSC) or their designee and documented on this form. Update this inventory list as equipment is purchased or retired from service, and at least annually

#	Type	Size	Make/Model	Manufacture Date	Serial Number/ID #	Location
EX.	Kevlar	Large	Memphis	N/A	N/A	Facilities Shop
1						
2						
3						
4						
5						
6						
7						
8						
9						
7						
10						
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19						
20						

Retain Original at Department Level & Submit Copy to Risk Management

Appendix G: Donning, Doffing & Disposal Gloves

- Always check gloves for holes, punctures, tears, cracking and discoloration before each use.
- Replace gloves as soon as signs of degradation appear.
- Long-term exposure and damage to a glove's surface can quickly reduce the protection offered.
- Direct chemical contact, soiled or torn gloves should be removed immediately, the hands washed and gloves replaced with a new pair.
- With disposable gloves, remove by peeling from the wrist and working toward your fingers.
- Keep the working surface of the glove from contacting your skin during removal.
- Place the discarded gloves in the designated container (See the "Disposal" section below.)
- Never wash or reuse disposable gloves.
- Reusable gloves must be washed before removal, handled only by the cuff and then properly stored.
- Wash your hands thoroughly with soap and water when changing into fresh gloves and after working with any hazardous materials.
- **Always remove gloves when picking up a telephone, touching door knobs, elevator buttons, or other equipment others touch bare-handed. Transport hazardous materials between labs using secondary containers that can be carried without gloves. Personal protective equipment should never be worn outside the laboratory area.**

Considerations:

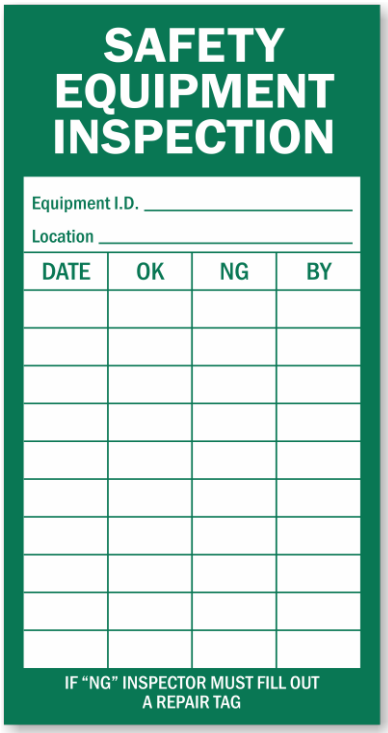
- Double gloving — Use double gloves to provide additional protection while still allowing freedom of movement. If a spill occurs, or if the glove starts to degrade or tear, hands will be protected after the contaminated outer gloves are removed. Check the outer glove frequently for signs of degradation, such as a change in color or texture. Re-glove whenever degradation occurs.
- Sleeve length — Make sure your gloves overlap the lower sleeves and cuffs of your lab coat or coverall when working with hazardous materials. Long-sleeved gloves or disposable arm-shields may be worn for further protection.
- Glove boxes — These sealed containers give additional protection when working with a highly toxic substance. They also provide an inert atmosphere for compounds that are sensitive to water or air. Glove bags serve the same purpose, and are more economical for short-term uses.

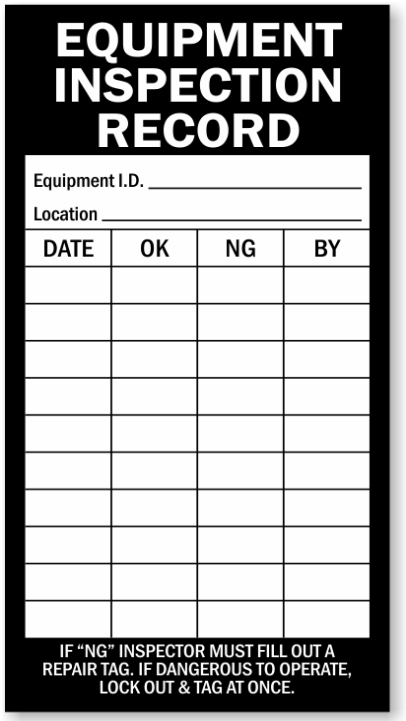
Dispose of used and damaged gloves according to whether or not they are contaminated with a hazardous material:

- No contamination — Place in regular lab trash.

Appendix H: Tool/Equipment Inspection Form

SAMPLES





Labels and Color Coding

SAFETY ASSURED INSPECTION CODING		
MONTH	**MONTH TESTED**	**COLOR OF TAPE(S) TO APPLY TO CORD**
1	January	White
2	February	White + Yellow
3	March	White + Blue
4	April	Green
5	May	Green + Yellow
6	June	Green + Blue
7	July	Red
8	August	Red + Yellow
9	September	Red + Blue
10	October	Orange
11	November	Orange + Yellow
12	December	Orange + Blue
Repair/Damaged		Brown

Appendix I: Emergency Response

To download and/or print this poster refer to SRM website: Campus Emergency Poster , Campus Emergency Response Guide

CAL MARITIME

EMERGENCY PROCEDURES

911

Evacuation

- Do not use elevators, use nearest stairs and exit.
- Follow directions given by the building monitors or Campus Officials
- Go to designated evacuation point and do not return to building until instructed to do so.
- Assist persons with mobility needs.

Fire

- Evacuate the building and notify occupants as you leave.
- Do not return until authorized by emergency personnel
- Do not use elevators
- Fire Extinguisher Instructions if trained:
- P- Pull pin
- A- Aim at the base of fire
- S-Squeeze handle
- S-Sweep from side to side

Hazardous Spill

- For spills not involving immediate danger, that are confined; contain and notify the Department of Safety & Risk Management (SRM) at 707-654-1076.
- For uncontained spill, contact Cal Maritime Police Department & SRM
- If immediate hazard or emergency exists, dial 911.
- Move away or evacuate the area.

Medical

- For all medical emergencies dial 911
- Be ready to describe natures and severity of the medical emergency.
- Provide the Campus location.
- Keep the victim calm and comfortable.
- Provide basic first aid/CPR/AED if trained.
- Report all work related injuries immediately to: Department of Safety & Risk Management and to Human Resources

Earthquake

- Drop, Cover, Hold under a table or desk or against an interior wall until the shaking has stopped.
- After shaking has stopped check yourself and others for injuries.
- Evacuate the building.
- Move towards the safest location away from building, tree's, power lines.
- Follow the instruction of the building monitors or Campus officials and be prepared for aftershocks

Bomb Threat

- Report all threatening calls to Cal Maritime Police Department
- Ask Caller: When the bomb is going to explode.
- Where the bomb is located?
- What does the bomb look like?
- Why did you place the bomb?
- If suspicious object is found: Do not handle and dial 911 immediately

Shelter in Place

- Stay in building; close and lock doors and windows.
- Move away from windows
- Do not use elevators
- Remain in shelter area until emergency personnel announce that it is safe

Active Shooter

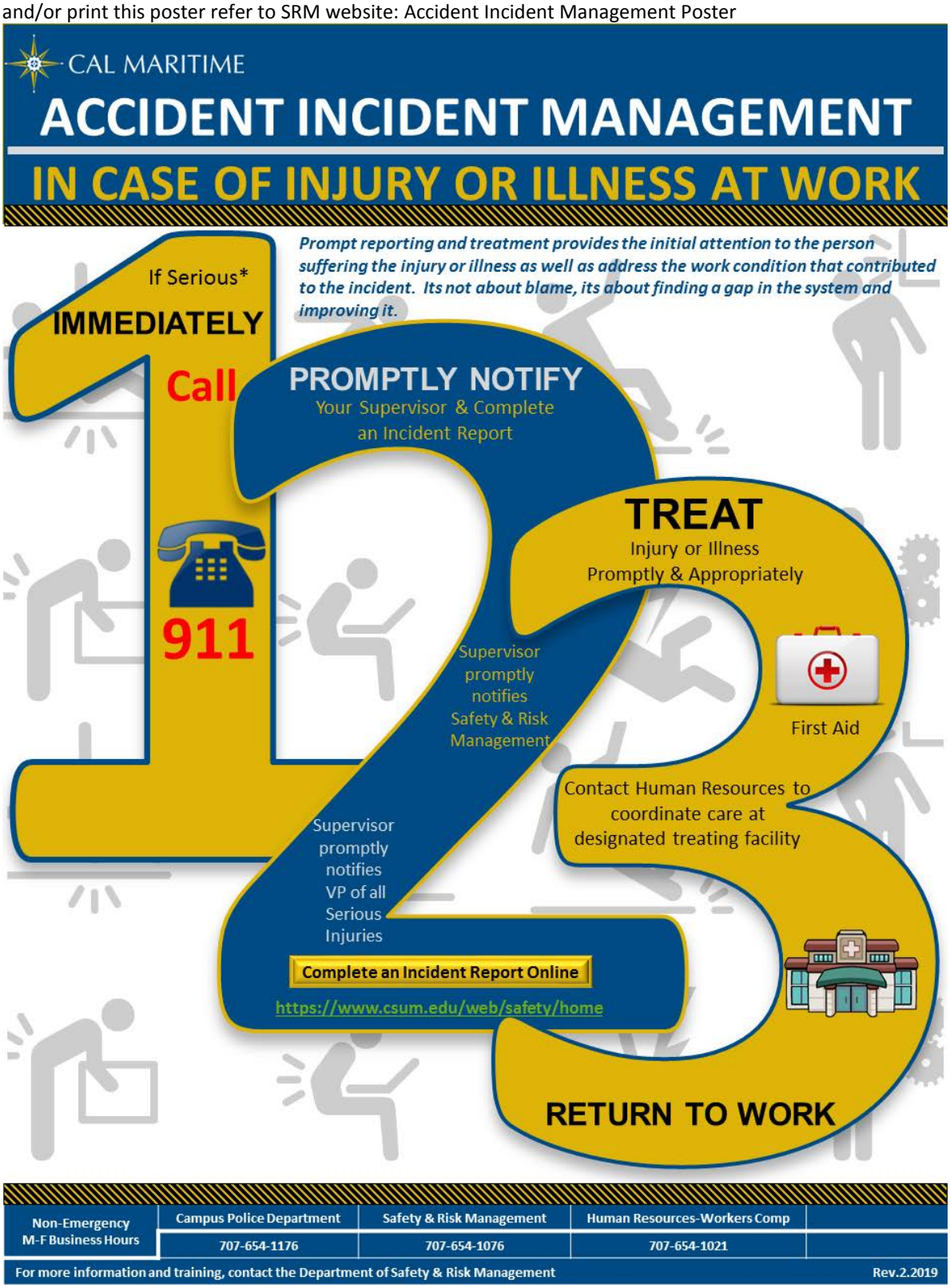
- **RUN**: leave your belongings behind. If there is an escape path attempt to evacuate. Help others if possible
- **HIDE:** If you cannot get out safely. Hide. Lock or barricade doors. Silence your cell phone and stay quiet.
- **FIGHT:** as a last resort, and if you life is in danger, you may attempt to incapacitate the shooter. Work in unison with others.

Non-Emergency M-F Business Hours	Campus Police Department	Safety & Risk Management	Facilities & Maintenance	Human Resources
	707-654-1176	707-654-1076	707-654-1120	707-654-1139

For more information and training, contact the Cal Maritime Police Department or the Department of Safety & Risk Management Rev.2019

Appendix J: Accident Incident Management

To download and/or print this poster refer to SRM website: Accident Incident Management Poster



Appendix I: Training Log

TRAINING SIGN IN SHEET

Subject			**Date**	
Instructor Name				
Department				
Course Level	❑ Awareness	❑ Competent Person	❑ Certified Person	❑ Other
Frequency	❑ Initial	❑ Annual-Refresher	❑ Process Change	❑ Post Incident

The attendees listed have satisfactorily participated and been tested per Regulation/University training requirements.

	PRINT NAME	STATUS (Staff, Faculty, Student)	SIGNATURE
1			
2			
3			
4			
5			
6			
7			
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Retain Original at Department Level & Submit Copy to Risk Management