ENGINEERING CLUB SAFETY PLAN

LAST REVIEWED/UPDATED

1. Introduction

The purpose of the Engineering Club Safety Plan is to help address the potential hazards and risks associated with Club shops and maker spaces and to prevent injuries and incidents from occurring. Engineering Clubs with shop and maker spaces are responsible to ensure that this template is customized and completed as a component of their club specific safety plan, in order to meet the university requirements implemented by Risk Management and Safety and the College of Engineering.

2. Scope

The policies and procedures in the Engineering Club Shop Safety Plan apply at all Club shops and maker spaces for club personnel and students.

[Name of Unit/Department] personnel authorized to work in the shop or maker space, or work with shop equipment:

- [LIST JOB OR WORK ASSIGNMENT TITLES AND TYPES AND/OR TASKS] THIS COULD LINK TO THE CLUB'S GOOGLE SHEET AND SHOULD INCLUDE THE CLUB'S CURRENT ROSTER

3. Roles and Responsib ilities

Role	Responsibilities
Unit/Department administra tor or upper management	• Accountable for safe and compliant operation of their shops and maker spaces. • Ensure appropriate resources are provided to support the safe operations of their shops and maker spaces. • Ensure that shop safety plans are developed and maintained of shop safety plans for all shop locations. • a qualified individual to serve as the shop safety coordinator. • Inform new shop safety coordinator(s) of shop safety plan requirements. • Notify Risk Management & Safety of new equipment purchases/donations.
Faculty Advisor/Shop Manager/Responsible Person	• Develop and maintain the shop safety plan. • Ensure this plan is reviewed with personnel, implemented, and followed by all personnel. • Ensure shop participation in Risk Management & Safety shop safety inspections.

Role	Responsibilities
	• Ensure personnel complete safety training and train direct reports on any unit or site-specific safety measures in places. Ensure training is documented. • Obtain and maintain required permits (e.g., local fire department). • Determine and implement mitigations to address shop safety inspection findings (recommendations). • Ensure all recommendations are addressed in a timely manner. • Address or escalate reported or observed safety concerns to a unit leader or to RMS. • Ensure all incidents are reported in ONBASE. Report to RMS immediately if a personal injury results in a fatality, hospitalization, amputation, or loss of eye.
Shop safety coordinator	• Be familiar with shop operations, hazards, and hazard controls specific to the shop. • Support the development, review, and maintenance of the shop safety plan. • Ensure personnel in shops complete required RMS training, Endeavor (tech) and Hands-on (tools) for operations. • Conduct and document shop-specific training on shop equipment, safe work practices and processes, and emergency procedures. • Maintain all training records and are accessible for shop inspection. • Restrict access to the shop and shop equipment to authorized personnel during authorized operating hours. • Maintain a safe environment and restrict access to unsafe facilities, equipment, and tools. • Enforce safety rules and procedures. • Enter and maintain a list of chemicals used and stored in the shop in Safety Stratus. • Ensure personnel have access to chemical safety data sheets (SDS) via Safety Stratus. • Identify and assess hazards in the shop and/or associated with the use and maintenance of shop equipment. • Support the Identification, implementation, and effectiveness of hazard controls.

Role	Responsibilities
	• Maintain shop documentation (e.g., shop safety plan, safety data sheets, job hazard analyses or standard operating procedures, machine guarding assessments, etc.). • Ensure signage/labels are in place. • Ensure personal protective equipment (PPE) is maintained, readily available, and used when needed. • Investigate and report accidents and incidents, including near misses, using the online accident reporting system (OnBase). • Perform shop safety self-inspections and follow-up on corrective actions identified through self-inspections. • Coordinate and participate in Risk Management & Safety shop safety inspections and accident investigations. • Support implementation and tracking of actions identified from RMS inspection findings.
Risk Management & Safety (RMS)	• Oversee University shop and maker space safety and compliance. • Maintain Shop Safety Program to meet or exceed regulatory requirements. • Conduct shop safety inspections at least every 2 years, or as determined by RMS and work with shops and units to address findings. • Escalate outstanding findings or issues of immediate safety to unit leadership per RMS escalation procedures. • Inform shop safety coordinators, PIs and Managers, and unit/department leadership of program requirements and updates. • Advise and assist shops with shop safety issues and procedures, as requested. • Provide access to general safety training courses. • Maintain a database of safety data sheets (SDSs) in Safety Stratus. • Maintain Shop safety website with requirements and resources. • Help investigate shop incidents or accidents.
Authorized personnel	• Only trained personnel and club members trained to use shop equipment and work in the club shop area. • Training is completed via 'hands-on' demonstration and computer based Endeavor training.

Role	Responsibilities
	• Know and comply with safety guidelines and policies required for all assigned tasks. • Complete all required and assigned safety training prior to using shop equipment. • Report unsafe conditions to your shop's safety coordinator, your immediate supervisor, or RMS. • Evaluate procedures and assigned tasks; perform them only after you believe the risk is at an acceptable level. • Select, maintain, and use PPE appropriately, consistent with your training and shop rules. Report accidents and incidents (including near misses) to your supervisor, and to the University using the Online Accident Reporting System (ONBASE).

Shop safety requirements

Club Leadership is required to:

1. **Create a Shop Safety Plan** using this template; and
2. **Review it with personnel** initially, **annually** , and when updates are needed.

Evaluate and consider the specific equipment and conditions (e.g., machine guarding, Lock-out/Tag Out, Lithium-Ion batteries, hot work, personal protective equipment, etc.) during your worksite projects and activities to successfully tailor this plan and procedures.

Attachment A can be used to document the review of this plan with unit/department personnel.

Shop safety coordinators, supervisors, and authorized personnel share responsibility for safety when working in the shop or maker space, or with shop tools.

Template Instructions: *The shop safety coordinator or a designee must complete the highlighted sections with shop-specific information, as applicable. Update the plan every two years (at minimum). Review this information with authorized personnel, prior to shop activities and when there are changes to the plan.*

Shop Emergency Contact Information

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Access control

Limiting and controlling access is critical to preventing untrained or unauthorized persons from incurring injury. This is particularly true in an academic setting where a shop may be part of a group of rooms in a large building with several occupants.

Instructions: Provide a description of how access is controlled, if there are specific operating hours and instructions for access to the shop, after normal operating hours.

Click or tap here to enter text.

Access to safety information

This Plan and associated materials may be in a variety of formats, including electronic, paper or a combination and must be always accessible to all personnel who work in shop areas. If shop safety program documentation is electronic, authorized personnel must have access to the electronic files. If multiple rooms are included in the shop, the plan must be readily available and not stored behind a locked door. It must also be available upon request from RMS staff and L&I representatives.

Instructions: Describe the location of shop safety information.

Click or tap here to enter text.

Housekeeping

All personnel and students have a responsibility to maintain a clean, uncluttered environment. Shop-specific expectations include the following:

1. Store all tools and materials neatly and in their place when not in use.
2. Establish and maintain clear access to safety equipment (e.g., emergency washing devices, fire pull stations, fire extinguishers), exits, and electrical panels.
3. Keep countertops and tables free of clutter for adequate workspace.
4. Clear floors and aisleways to minimize trip hazards.
5. Secure machinery and large items.
6. Machinery that vibrates or is top-heavy must be secured/mounted to the floor or a bench to prevent tipping hazards.
7. Machines designed to stay in one place shall be secured so they will not move or change position during use. This is especially critical for heavy objects (those over 400 pounds) or those with a center of gravity more than four feet above the floor. A rule of thumb is if the item is four feet or taller and has a height-to-base ratio of 2.5 or more, the item should be braced to prevent toppling.
8. Other large items, especially those with a large height to width ratio, can tip over during an earthquake and should be secured. In some cases, large equipment must

have shock absorbing vibration isolators to allow differential movement without potential failure or toppling.

9. Remove garbage and debris regularly to prevent clutter and reduce combustible loading.
10. Store oily rags in a listed labeled container and dispose of them daily.
11. Keep chemical containers closed and properly stored. Chemical waste must be labeled and collected by Risk Management & Safety. Request RMS pickup by submitting a Chemical Discard Tag Form.
12. Reduce dust accumulation. Special-purpose vacuums, such as HEPA vacuums, are useful for removing hazardous dust debris. Wet sweeping floors is a common practice to reduce the amount of airborne dust while cleaning up debris. Compressed air must not be used for removing dust, debris, or chips from personal clothing or body. If compressed air is used for cleaning surfaces, the pressure must be set below 30 psi and there must be effective chip guarding and PPE for all personnel in the area.
13. Ventilation: Evaluate the need for safe application of spray finishes and/or working with chemicals and materials with strong odors and potential inhalation hazards including finishes, solvents, epoxies, resins, and other composites. Appropriate engineering controls including paint booths, exhaust hoods/snorkels or chemical fume hoods must be incorporated into the design of the facility.
14. Prohibit Food and drink while work is actively being conducted in the shop and where hazardous materials are present. Food and drink are allowed in an area that is a dedicated break area with no shop equipment or work permitted in that area.

ADD ADDITIONAL SHOP SPECIFIC HOUSEKEEPING INFORMATION.

Hazard communication

Individuals who work with or have the potential to be exposure to hazardous chemicals and substances are required to receive hazard awareness training and be aware of the identity, potential physical and health hazards, and the safe work practices that can minimize exposure. Supervisors and principal investigators, regardless of where they work, are required to train their personnel on the hazards of the chemicals used in the workplace. Chemical hazard information for all workplaces is covered under the University's Chemical Hazard Communication Program Manual.

Shops must ensure a complete and accurate list of chemicals used and stored is maintained in the online Safety Stratus inventory management system. Each product/chemical listed in the shop's inventory must have a current safety data sheet (SDS) uploaded. SDSs are documents that describe the physical and health hazards of chemicals. Manufacturers of chemicals must provide SDSs for chemicals they sell. Information on SDSs can be found here. Shops must maintain up-to-date chemical inventories in Safety Stratus and to review them annually to facilitate compliance with local Fire Department

Hazardous Material Storage and Use Permits (occupancy permits), EPA Community Right-To-Know reporting and Department of Homeland Security chemical security requirements. Contact information in MyChem should also be kept up to date; delete contact information for anyone who no longer needs access to the chemical inventory. The person(s) responsible for maintaining the shop's chemical inventory in Safety Stratus:

Name of person responsible for maintaining the shop chemical inventory in Safety Stratus.

Authorized personnel must complete the general Hazard Communication training and also receive training on the specific chemical hazards that may be present prior to working in areas where chemicals are used, transported, stored, or manufactured. Refer to the safety training section for a complete list of pertinent safety trainings related to chemicals used, transferred, and stored in the shop.

Working alone

Units and shop managers should develop requirements and/or procedures to ensure the safety of personnel and students when working alone. The information in the Working Alone Safely focus sheet applies to work or study occurring when no other person is in direct line of sight or within hearing range of the person working. A person may work alone in a lab, office, shop, other University location, or in the field. Working alone can take place during normal working hours, as well as on evenings and weekends. Units are strongly encouraged to have established hours of operation and an authorization process for personnel requesting to work outside of those hours and wh at activities can be performed while working alone. The authorization processes ensure safety measures are in place such as a buddy system to check -in and emergency procedures in case of injury are reviewed and confirmed.

Pre-planning to identify and asses s the risks and safety measures needed for a task is an important element of accident prevention. Consider personal safety, emergency response procedures, and reduced building occupancy when planning and approving the conditions in which personnel and stud ents may alone:

1. Authorization/notification to work alone. Manager or supervisors should authorize and approve personnel and students to work alone. They should know when work will be done, what activities will be performed, and issue approval to work alone .
2. Implement a buddy system and ask your buddy to check in on you periodically and to confirm you have left the shop safely.
3. Ensure you have a way to contact emergency services in your workspace.
4. Assess the risks of the activity with your supervisor before hand.
5. Do not perform tasks that are not appropriate for working alone as defined by your supervisor (e.g., operating a lathe, high voltage or high current equipment, cryogens, hot work .
6. Minimize the amount(s) of hazardous materials used.
7. Document your work plan and include emergency contacts.

8. Be alert and aware of your surroundings. For example, avoid wearing ear buds or headphones as it reduces situational awareness.
9. Wear the required personal protective equipment (PPE) in the workplace, even after hours.
10. Know the location of and maintain clear access to emergency equipment (e.g., first aid kit, safety shower, eyewash, fire extinguisher, spill kits).

*Instructions: List shop-specific activities that are **not** allowed when working alone:*

List equipment or processes not permitted when working alone.

Safety training

1. The shop safety coordinator(s) and/or the unit/department administrator or principal investigator/supervisor are responsible for ensuring that all personnel receive adequate training to understand the hazards present in their work area.
2. Authorized personnel must receive training on shop-specific equipment and processes. Use standard operating procedures, owner equipment manuals, instructor-led equipment-specific training, PPE assessments, and/or a job hazard analysis to fulfill this training requirement.
3. Refer to the RMS Course Guide to determine additional required and recommended courses.
4. Training must occur prior to beginning a work assignment involving a new hazard(s).
5. Conduct refresher training or retraining when any of the following occur:
    a. There is a change in job assignment; or
    b. Authorized personnel did not follow required procedures; or
    c. A change in machinery or equipment; or
    d. Addition of a new chemical, process, or process change that presents a new hazard.
6. Each shop must have a method for tracking all training that authorized personnel receive prior to working with hazardous equipment or other hazards. Refer to Appendix A and Appendix C to document training on the shop safety plan and other required training. RMS maintains training records for all courses provided by RMS; individuals, supervisors and managers can access training records on the RMS website.
7. All contractors, vendors, and visitors must receive sufficient training on the hazards and on adequately protecting themselves while in the shop. Refer to the Contractors and Hazard Communication Focus Sheet on the RMS website for more information.

Instructions: List all required and recommended shop safety training.

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Personal protective equipment (PPE)

Instructions: Document the PPE required for each hazard in the shop by completing a PPE hazard assessment. Use the Shop PPE Hazard Assessment Guide on the RMS website

Shops and maker spaces have two options for training personnel:

1. Train all authorized per sonnel on PPE requirements and document the training; or
2. Train authorized personnel on the PPE required for specific tasks, activities, or hazards they may encounter in the shop and document the training. This training can occur using standard operating p rocedures or job hazard analysis, as addressed in the following section. Training authorized personnel by task or activity may be more beneficial when PPE requirements vary greatly by task or have nuances specific to hazards in the task.

Instructions: List all required PPE, and where it is stored.

Personal Protective Equipment	Task	Storage Location
Example: Safety glasses	All tasks in shop	Cabinet by sink
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Personal Protective Equipment	Task	Storage Location
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Minimum Shop Attire

- Shoes should fully cover the feet to protect against spills; no open-toed shoes or sandals are permitted, and shoes constructed of mesh (such as athletic shoes) are not recommended. Neck ties, necklaces, bracelets, jewelry, and watches must be removed before operating machinery.
- Clothing should fully cover your legs.
- Do not wear loose-fitting clothing. roll up and secure long-sleeved shirt above the elbow before operating machinery.
- Long hair must be tied back to avoid entanglement in machinery.
- Gloves are *not* allowed to be worn when working within the hazard zone of machinery with rotating parts or where exposure to potential hazards can result in entanglement.

Specific activity and process hazard assessments

Instructions: Shops must supplement their shop safety plan with additional safety requirements specific to the equipment, activities and processes performed in the shop. Hazards common to shops and shop equipment can include noise, cranes, hoists, and rigging, electrical, portable tools, 3D printers, hot work (welding, torching, cutting, and soldering), lasers, and work with specific hazardous materials. Information on these recognized hazards and requirements that can be found in Appendix A of the Supplemental Accident Prevention Plan Template on the RMS website. Supplemental Accident Prevention Plan Template on the RMS website.

Develop and maintain hazard assessments for specific activities or processes with hazardous equipment or substances. The shop safety coordinator or designee observes workplace operations, identifies hazards and develops written procedures to prevent injury. Conduct a new hazard assessment when procedures or equipment changes and train authorized personnel on new and updated procedures.

1. JOB HAZARD ANALYSIS (JHA)

   A JHA is a method for identifying and evaluating hazards associated with tasks (steps) with a specific activity (job) or process and eliminating or mitigating them prior to conducting work.

   Instructions: Reference example JHAs. Use the Job Hazard Analysis Template and Instructions, or other resources to develop JHAs for your shop. More information is available on the Job Hazard Analysis page on the RMS website.

2. STANDARD OPERATING PROCEDURES (SOP)

An SOP is a set of step-by-step instructions used to standardize procedures and communicate hazards for a specific procedure, process, or piece of equipment.

Instructions: Download SOP templates on the Shop and Maker Space Safety page on the RMS website and customize them for your shop.

Instructions: List all shop equipment/machines and specific standard operating procedures (SOPs) and/or job hazard analyses (JHAs) required by authorized personnel who will performing a specific activity/task to read and understand prior to commencing work.

Shop Equipment/Machines	SOP or JHA Title	Version#

Incident response

Units are responsible for ensuring that authorized personnel have:

1. Reviewed and are familiar with the Fire safety and evacuation plan for their specific building, specifically the procedures for evacuation and emergency response, including the location of fire extinguishers and fire pull stations in the shop.
2. Effective first aid and first-aid supplies are readily accessible in work areas.

Instructions: Refer to the First Aid Plan Guidelines on the RMS website for instructions on documenting your shop's plan to provide quick and effective first aid to personnel in an emergency.

3. Emergency washing equipment, eyewash and/or showers are required to be located in shops and areas where personnel are working with shop equipment or performing activities where chemicals are used, stored, or transferred and where there is a potential for the generation of particulates (wood, metal, plastic, etc.), fumes, and mists. Emergency washing equipment must be installed in accordance with the UW Facilities Design Standards – RMS Emergency Washing Equipment. Contact RMS at ehsshop@uw.edu for emergency washing equipment need assessments.

Eye wash equipment must be flushed weekly to ensure they are operating correctly, and the flushing must be documented, in accordance with Washington Administrative Code (WAC) 296- 800-15035. Weekly flushing checks that eyewashes work and provide a strong enough stream of water to reach the eyes of someone bending over it and help keep the water clean. During the weekly check, the eyewash should be operated long enough (30-60 seconds), so that there is no visible rust or contaminant in the water. If the eye wash equipment is in a shared area, an individual should be appointed to perform the weekly test. All groups using the shared area should have access to the flushing records and know where they are stored.

Safety showers are tested annually by Facilities Services. A tag indicating the most recent test date should be found on the equipment. Contact the building facilities and engineering service department if a test or maintenance is needed.

Reporting incidents

Instructions: Ensure all authorized personnel report incidents immediately to their supervisor or shop safety coordinator.

UW personnel are required to submit an incident repo rt to RMS for any work -related event that results in an injury, illness, exposure, fire, or near -miss event.

Call RMS at (206) 543 -7262 immediately, if the incident involves any of the following:

- In-patient hospitalization
- Amputation
- Loss of an eye
- Fatality

To report other safety concerns, refer to the RMS Reporting website for information.

Safety self -inspections

At least once annually, the shop safety coordinator performs an inspection of the shop to identify hazards and determine corrective actions for any deficiencies identified.

Self-inspections involve:

1. Ensuring the proper function of all shop equipment;
2. Reviewing SOPs/JHAs for accuracy and completeness;
3. Identifying personnel who require additional safety training or retraining; and
4. Checking on the continued adherence of personnel to all safe work practices and procedures.

Instructions: RMS provides the shop safety coordinator or their designee access to the online shop safety inspection application to assist with performing the safety self-inspection. Alternatively, there is a Shop Safety Self-Inspection Checklist available for download from the Shop and Maker Space page on the RMS website.

4. Definitions

Guards – A barrier that does at least one of the following:

(a) Prevents the hands or other body parts from reaching through, over, under, or around the guard into the hazard area.

(b) Prevents objects or debris from falling onto or being ejected towards an employee.

Types of guards include: fixed, interlocked, adjustable and self-adjusting.

Listed - equipment is listed if it 1) is listed in a publication by a nationally recognized laboratory (such as UL, underwriters laboratory) that inspects the production of that type of equipment; and 2) states the equipment meets nationally recognized standards or has been tested and found safe to use in a specific manner.

Point of Operation - Area where machine performs work on material.

Power Transmission Apparatus - Belts, gears, flywheels, chains, pulleys, spindles, couplings, cams, machine components that transmit energy.

Other Moving Parts - Reciprocating, rotating, traversing motions, auxiliary machine parts.

Maker space – Maker spaces, also known as fabrication labs and hacker spaces, are places to gather, exchange ideas, invent, and create. These spaces are found in libraries, dormitories, academic and other workshops, both on and off-campus. The tools and equipment often include hand tools, computers, and software, and may include three dimensional (3D) printers, laser cutters, and milling machines. Maker Spaces are covered under the shop safety program and subject to all program requirements. It is the responsibility of the sponsoring organization and the users to ensure that the spaces and equipment are used and maintained in a safe manner.

Safeguarding (Safeguards) – This is an umbrella term for the application of protective measures to reduce the risk of injury from contact with hazardous energy or other unsafe conditions. Safeguards can include guards, safety devices (e.g., interlocks, alarms), shields, awareness barriers, warning signs, safe work procedures, personal protective equipment (PPE) and a combination of all the above.

Shop - A shop is a designated room or area (single room, a group of rooms, or a part of a room) where fabrication and/or repair activities occur, using tools and machinery that present physical hazards to occupants. Shops at the university include a broad range of uses that support teaching, research and facility maintenance and repair where physical hazards from tools and machinery are more prominent and considered hazardous to an untrained person.

5. References

Washington Administrative Code (WAC) 296-800 Safety and Health Core Rules

Washington Administrative Code (WAC) 296-806 Machine Safety

Washington Administrative Code (WAC) 296-807 Portable Power Tools

UW Accident Prevention Plan

Metallic Lead Safety Focus Sheet

ANSI B11.0 – 2020 Safety of machinery

ANSI B1.19 -2019 Performance Requirements for Risk Reduction Measures: Safeguarding and other Means of Reducing Risk

APPENDIX A: SAMPLE DOCUMENTATION FORM

Unit or Site -Specific Shop Safety Plan Review

Workplace Name:

Name	Training Date	Signature
Click here to enter name.	Click here to enter date.	
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By signing this log, you confirm that you have been provided with site specific shop safety information, that the content of the information is understood, and that you have had an opportunity to ask questions.

APPENDIX B: SHOP SAFETY SELF-INSPECTION CHECKLIST

Download the most recent version of the Shop Safety Self-Inspection Checklist from the RMS website.

ENVIRONMENTAL HEALTH & SAFETY
UNIVERSITY of WASHINGTON

Enter information electronically in shaded areas, name Word document file, and save to device. Or print document to enter information manually.

Shop Safety Self-Inspection Checklist

Campus: Unit/department:
Facility: Room(s):
Shop coordinator: Email address:
Inspection conducted by: Date:

Instructions: *Complete the entire checklist when performing an annual self-inspection of each shop area/location. Note the item number and deficiencies at the bottom of the checklist. Document the corrective action(s), mitigation owner and timeline for implementation for each item.*

	Administrative		Yes	No	N/A
1		Is the location required to have a shop safety plan? If yes, answer the sub-questions below	☐	☐	☐
	1a	Does the shop have a shop safety plan?	☐	☐	☐
	1b	Is the shop safety plan up to date?	☐	☐	☐
	1c	Is the shop safety plan accessible to all shop personnel?	☐	☐	☐
2		Is the location required to report near misses and accidents? If yes, answer the sub-questions below.	☐	☐	☐
	2a	Were all shop near-misses or accidents since previous Shop Safety Inspection reported?	☐	☐	☐
	2b	Are all shop near-misses and accidents reported using the Online Accident Reporting System (OARS)?	☐	☐	☐
3		Was a safety self-audit performed within the last 12 months?	☐	☐	☐
4		Is the shop kept secure when unoccupied and effectively managed to prevent access by unauthorized personnel?	☐	☐	☐
5		While work is being completed in the shop, is food and drink prohibited in shop areas?	☐	☐	☐
6		Does the shop require safety training? If yes, answer the sub-questions below.	☐	☐	☐
	6a	Has an EH&S safety training assessment been completed and address hazards of shop staff and users?	☐	☐	☐
	6b	Has safety training (EH&S or equivalent) been completed and documented for shop staff and users?	☐	☐	☐
7		Is PPE required in the shop?	☐	☐	☐
	7a	Has a PPE hazard assessment been completed and documented? If yes, answer the sub-questions below	☐	☐	☐
	7b	Have all shop users been trained on the PPE hazard assessment and how to select, use, inspect, and maintain PPE?	☐	☐	☐
	7c	How many shop users have not been trained on the PPE hazard assessment and how to select, use, inspect, and maintain PPE?			
	7d	Is PPE in good condition, properly stored, and easily accessible?	☐	☐	☐
8		Other issues:	☐	☐	☐
	Housekeeping		**Yes**	**No**	**N/A**
9		Is the shop adequately organized, orderly, and clean to provide sufficient workspace and are hazard zones clearly marked?	☐	☐	☐
10		Are the shop floors free of slip/trip/fall hazards, clutter, or obstructions to safe movement?	☐	☐	☐
11		Are dust collection systems present where needed and regularly emptied and maintained? [	☐	☐	☐
12		Are processes that emit vapors, gases, or fumes adequately captured at the source by local ventilation (hoods, snorkel)?	☐	☐	☐
13		Is soldering conducted in a well-ventilated area or with portable exhaust ventilation (i.e., a fume extractor)?	☐	☐	☐
14		Are high noise areas clearly labeled?	☐	☐	☐
15		Other issues:	☐	☐	☐

Enter information electronically in shaded areas, name Word document file, and save to device. Or print document to enter information manually.

		Shop Equipment Activities	Yes	No	N/A
16		Does all machinery, equipment, power tools, and/or hazardous activities have shop specific standard operating procedures (SOPs) or job hazard analysis (JHAs) completed?	☐	☐	☐
17		How many pieces of machinery, equipment, power tools, and/or hazardous activities are missing shop specific standard operating procedures (SOPs) or job hazard analysis (JHAs)?			
18		Have all users that operate shop machinery or equipment had hands on training with shop specific equipment and been trained on the SOPs or JHAs?	☐	☐	☐
19		Are all hand-operated tools free of defects (such as cracked handles, frayed or damaged cords, missing parts, missing guards, etc.) that make them unsafe?	☐	☐	☐
		Corrected on-site:	☐	☐	☐
20		Do all machines have proper engineering controls (manufacturer-supplied, fixed, or self-adjusting) machine guards on all pinch points, crush points, rotating parts, blades, tooling, and chucks?	☐	☐	☐
		Corrected on-site:	☐	☐	☐
21		Does the shop have a process to change out and / or sharpen tooling and drill bits when they become dull or damaged?	☐	☐	☐
22		Are there pressure systems, tanks, or vessels? If yes, answer the sub-questions below	☐	☐	☐
	22a	Have ASME vessels been registered?	☐	☐	☐
	22b	Do they have a pressure relief device?	☐	☐	☐
	22c	Does it discharge to a safe place?	☐	☐	☐
	22d	Are compressor air nozzles outfitted with pressure reducing devices?	☐	☐	☐
23		Is all machinery seismically restrained where required?	☐	☐	☐
24		Other:	☐	☐	☐
		Hazardous Energy	**Yes**	**No**	**N/A**
25		Do employees engage in service, repair or maintenance operations on machines that are capable of being locked out (cord & plug exempt) and that expose them to hazardous energy from unexpected energization, startup, or release of stored energy? If yes, answer sub-questions below.	☐	☐	☐
	25a	Do all employees that conduct repairs, service, or maintenance on equipment and machines have lockout/tagout equipment? (locks, tags, group lockbox, lockout devices, etc.)	☐	☐	☐
	25b	Does all equipment and machines requiring repair, service or maintenance have equipment specific lockout/tagout (LOTO) procedures in place, if applicable?	☐	☐	☐
	25c	How many pieces of equipment and machines are missing repair, service or maintenance have equipment specific lockout/tagout (LOTO) procedures in place, if applicable?			
	25d	Has the equipment specific lockout/tagout procedure and authorized person been reviewed in last 1 year?	☐	☐	☐
26		Do all batteries have safe storage, charging and handling guidelines in place?	☐	☐	☐
27		Are electrical panels and breakers, and equipment shut off switches accessible and labeled? [	☐	☐	☐
28		Are extension cords used only as temporary wiring, with no daisy chaining involved, and not running under carpets, doors, or through walls and ceilings?	☐	☐	☐
29		Is equipment with motors, heaters, and other high amperage needs plugged directly into wall receptacles?	☐	☐	☐
30		Are controls in place for work on or near exposed energized parts of 50 volts or more AC or DC?	☐	☐	☐
31		Other issues:	☐	☐	☐
		Cranes, Hoists, Powered Industrial Trucks & Other Heavy Equipment	**Yes**	**No**	**N/A**
32		Is there specialized equipment in the shop that requires skilled and trained operators (i.e., cranes and hoists, forklifts)? If yes, answer the sub-questions below.	☐	☐	☐
	32a	Are all heavy equipment operators trained on the task and the specific equipment?	☐	☐	☐
	32b	Does all heavy equipment have specific standard operating procedures or job hazard analysis completed?	☐	☐	☐
	32c	Are powered industrial trucks (e.g., forklifts) used and stored appropriately?	☐	☐	☐
	32d	Are cranes inspected frequently and periodically, and documented?	☐	☐	☐
	32e	How many cranes are not inspected frequently and periodically, and documented?			
	32f	Is rigging equipment in good condition and routinely inspected, and documented?	☐	☐	☐
	32g	How many pieces of rigging equipment are in poor condition and haven't been routinely inspected and documented?			

Enter information electronically in shaded areas, name Word document file, and save to device. Or print document to enter information manually.

33		Other issues:	☐	☐	☐

		Hazardous Materials/Chemicals	Yes	No	N/A
34		Are there chemicals present in the shop? If yes, answer the sub-questions below.	☐	☐	☐
	34a	Are chemicals inventoried in MyChem?	☐	☐	☐
	34b	Is the chemical inventory up to date in MyChem and reviewed annually?	☐	☐	☐
	34c	Do all shop users have access to chemical SDS information?	☐	☐	☐
	34d	Are flammable chemicals properly stored?	☐	☐	☐
	34e	Is hazardous waste (such as oily rags/contaminated shop towels) properly stored and disposed of?	☐	☐	☐
	34f	Are all chemical waste containers, including batteries for recycling, properly tagged/dated/labeled with an original label or a UW Hazardous Waste Label?	☐	☐	☐
	34g	How many chemical waste containers, including batteries for recycling, are not properly tagged/dated/labeled with an original label or a UW Hazardous Waste Label			
	34h	Does the shop have a chemical spill kit?	☐	☐	☐
35		Does the shop use and store compressed gas cylinders? If yes, answer the sub-questions below.	☐	☐	☐
	35a	Are incompatible compressed gas cylinders segregated when they are in storage and stored properly?	☐	☐	☐
	35b	Are gas cylinders labeled, secured, and have valve protection caps in place for gas cylinders not in active use?	☐	☐	☐
36		Other issues:	☐	☐	☐
		Hot Work/Welding	**Yes**	**No**	**N/A**
37		Is hot work performed in the shop? If yes, answer the sub-questions below.	☐	☐	☐
	37a	Is there a current fire permit for Hot Work, if required, and kept on file?	☐	☐	☐
	37b	If required, is a fire watch present during and after hot work?	☐	☐	☐
	37c	Since the last inspection, has the facility, room use, and hot work designated area remained the same and meets the conditions that impact the hot work permit?	☐	☐	☐
	37d	Are all combustibles (including paper, wood, textiles, etc.) and dust/debris on floors kept at least a 35-foot radius away from the hot work permissible area?	☐	☐	☐
38		Other issues:	☐	☐	☐
		Building, Fire Life, Safety	**Yes**	**No**	**N/A**
39		Does the shop have a properly stocked first aid kit?	☐	☐	☐
40		Are safety signs (MyChem, PPE, Shop Rules, etc.) posted and conspicuous?	☐	☐	☐
41		Is an emergency washing device required? If yes, answer the sub-questions below.	☐	☐	☐
	41a	Are emergency washing devices accessible within 10 seconds travel (approximately 50 feet) from work areas that present exposure hazards?	☐	☐	☐
	41b	Are eyewashes and showers maintained and routinely tested?	☐	☐	☐
42		Are fire extinguishers available, easily accessible, and free of obstructions?	☐	☐	☐
43		Have fire extinguishers been inspected in the last year and been fully charged?	☐	☐	☐
44		Are the fire sprinklers unobstructed?	☐	☐	☐
		Corrected on-site:	☐	☐	☐
45		Other issues:	☐	☐	☐

Item #	Comments/Action Items

APPENDIX C: TRAINING RECORDS LOGS

Instructions: Document formal and informal safety discussions, including meetings when the agenda includes any safety topics using one or more of the safety training record logs below. Document all safety discussions that may cover personal protective equipment, ventilation systems, specific chemical hazards, SDS access, chemical storage plans, machine guarding, fire safety, housekeeping, hot work, and other safety topics. Attach a training outline and other reference materials useful for training new personnel.

The Example Chemical Safety Training Log shows an example of a form that can be used to document a safety training session for a group. After being filled out, this form can be filed with the Shop Safety Plan. If filed separately from the Shop Safety Plan, the filing location should be noted in the Shop Safety Plan and the location made available to all shop personnel.

Example Shop Safety Training Log

Shop Safety Coordinator/Supervisor: Click or tap here to enter text.

Unit/Department: Click or tap here to enter text.

Date	Trainer	Trainees	Description of Safety Training
8/16/2023	Denise Bender	AP # 1, AP #2, AP 3#	LOTO for Authorized Personnel
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
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Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

Equipment -Specific Safety Training Log

The Equipment -Specific Safety Training Log is a form that can be used to document training for an individual employee on shop equipment. Alternatively, the shop may choose to document training on a log within the equipment -specific SOP.

Is training for the use of specific equipment completed and documented in shop SOPs?

☐Yes ☐ No

List equipment -specific training below that is *not* documented in an SOP.

Shop Safety Coordinator/Supervisor: Click or tap here to enter text.

Trainee name: Click or tap here to enter text.

Name of Equipment	Policies and Practices Reviewed	Date
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.

Shop-Specific Safety Training Log

The Shop-Specific Safety Training Log is a form that can be used to document training for an individual employee on shop -specific policies, procedure s, and/or job hazard analyses. Alternatively, the shop may choose to document training on a log within an SOP or JHA.

Is training for specific procedures completed and documented in shop SOPs? ☐ Yes ☐ No

List specific procedure trainings below that are *not* documented on SOPs and/or JHAs.

Shop Safety Coordinator/Supervisor: Click or tap here to enter text.

Trainee name: Click or tap here to enter text.

Name of SOP/JHA	Policies and Practices Reviewed	Date
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.

Name of SOP/JHA	Policies and Practices Reviewed	Date
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.

Additional Shop -Specific Safety Training Log

The Additional Shop-Specific Safety Training Log is a form that can be used to document training for an individual employee on shop-specific hazards or practices not documented elsewhere, such as confined spaces, lockout/tag-out, cranes and hoists, heavy operating equipment, etc.

Is additional training for hazards or practices not listed in the previous sections completed and documented for shop SOPs? ☐Yes ☐ No

List specific procedure trainings below t hat are *not* documented on SOPs.

Shop Safety Coordinator/Supervisor: Click or tap here to enter text.

Trainee name: Click or tap here to enter text.

Name of Training	Policies and Practices Reviewed	Date
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.
Click or tap here to enter text.	☐ Yes	Click or tap to enter a date.

APPENDIX D: MACHINE SAFEGUARDING

Machine safeguarding is a key component of operating equipment safely in a shop or lab. The purpose of machine safeguarding is to protect the machine operator, and other personnel in the work area from hazards created by pinch points, rotating parts, flying chips, and sparks. Machine safeguards should be in conformity with any appropriate standards. The applicable machine safeguarding Washington Administrative Code standards are WAC 296-806-20027 through WAC 296-806-20042, depending on the machine and its operation.

A combination of **safeguards** (rigid barriers) and **device s** (interlocks, stop buttons) must be used to protect against the hazards of:

- Power transmission devices – belts, gears, flywheels, chains, pulleys, spindles, couplings, cams, machine components that transmit energy
- Points of operation – area where machine performs work on material; cutting, shearing, punching, bending, etc.
- Moving parts – reciprocating, rotating, traversing motions, auxiliary machine parts
- Flying chips, sparks, or fluids
- Falling objects
- Moving surfaces with hazards such as sharp edges, burrs, and protruding nails and bolts.

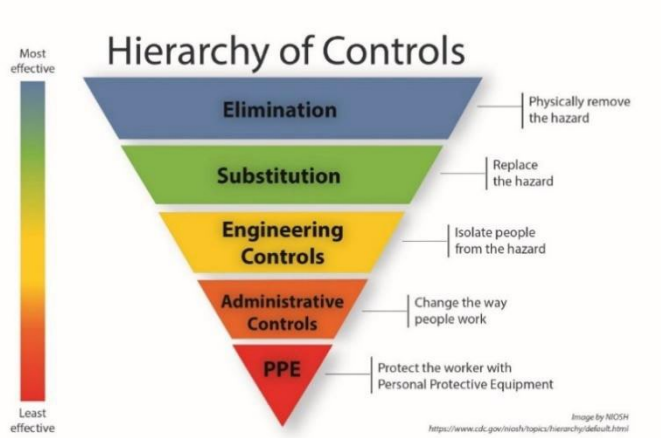
Any machine part, function, or process must be safeguarded to protect personnel from injury. Suppliers are responsible for ensuring that risk reduction measures are implemented as part of the design, construction, integration, and installation in accordance with all applicable laws, codes, and standards.

The unit/department is responsible for:

1. **Identifying hazards** and **assessing risks** associated with the machine and processes (using a job hazard analysis); and
2. Implementing **risk reduction measures/controls** (refer to the Machine Safeguarding Guide for commonly used machines and equipment); and
3. Ensuring the **appropriate machine safeguarding** is in place before use (following the Machine Guarding and Safety Assessment Self-Inspection Checklist).

Instructions: Risk reduction measures must be based on a risk assessment that is ideally performed by a team of people that operate and maintain the equipment/machines. A job hazard analysis (JHA) can be used to document the risk assessment for all tasks identified for the equipment/machine (e.g., setup, start-up, shutdown, inspection, servicing, maintenance, and repair. Based on the risk assessment, the type and number of controls may be selected based on the severity of the consequences identified. Typically, the higher the severity the more effective controls will be required, and the number of controls will likely increase.

Use the Hierarchy of Controls (shown at right) to establish the acceptable level of risk for each accident scenario considered.



Hierarchy of Controls for machine safeguarding: Examples

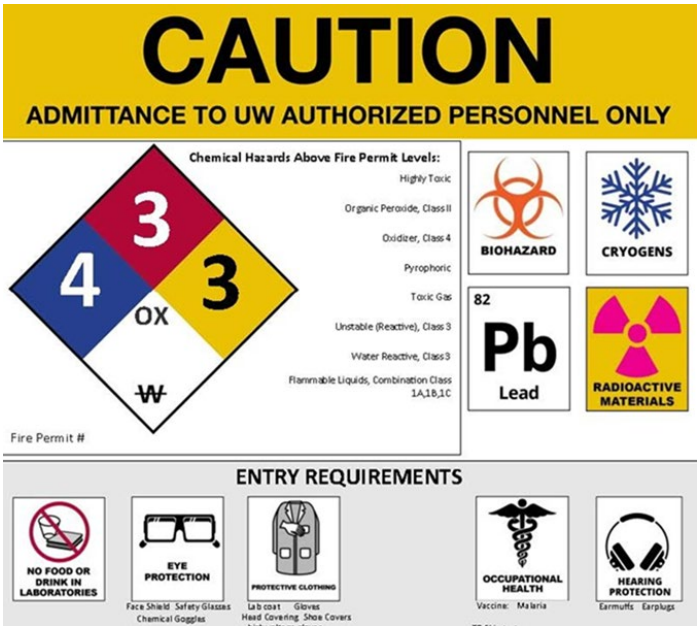
Category	Control	Effectiveness at reducing risk
Elimination	• Eliminate pinch points • Automate process • Purchase machined parts and components	Most effective – eliminates hazards/risks
Substitution	• Redesign to reduce or eliminate human interaction • Reduced energy • Substitute less hazardous chemicals	Reduces the overall risk by reducing the level of severity of harm
Engineering Controls	• Guards • Shields or barriers • Safety Interlocks devices • Pressure-sensing devices (safety curtains, safety mats) • Two handed controls • E-stops (push button/trip wire, foot-operated device)	Reduces the overall risk by reducing the likelihood or probability of harm Minimal if any impact on the severity of harm
Administrative Controls	• Warning devices (e.g., lights beacons and strobes, horns) • Signs and labels • Awareness barriers	Potential to reduce the likelihood or probability of harm; Does not impact the severity of harm
PPE	• Safety glasses • Face Shields • Gloves • Ear plugs • Protective footwear • Respirators	Potential to impact likelihood or probability of harm; Does not impact severity of harm

The Machine Guarding and Safety Assessment Self-Inspection Checklist on the RMS website can be used in conjunction with the risk assessment to evaluate if the machine and machine operations are adequately safeguarded from the potential identified hazards and risks. Deficiencies identified by the risk assessment must be corrected prior to further use of the machine or equipment.

The information presented in the Machine Safeguarding Guideprovides guidance on machine safeguarding and safe work practices when operating common shop equipment.

APPENDIX E: SIGNAGE AND LABELING

Shop safety signage is required to be placed at the shop entrance and within the shop as noted.



Required shop signage

Caution signs are required to be posted at the entrance to a space where hazardous materials are stored or used. The caution sign alerts em ergency responders and visitors of potential hazards and precautions for entry (refer to the example at right). Visit the Caution and Warning Signs page on the RMS website for more information on how to print a caution sign.

The Staying Safe In Shops poster is required to be posted at the shop entrance or within the shop space.

Recommended shop signage

Warning signs alert personnel to health and safety hazards present in the shop beyond those identified in the caution sign. Shop-specific PPE signage or signage indicating specific hazard warnings (refer to images below) are recommended to be placed adjacent to the hazard.

Contact EhsShop@uw.edu to request additional copies or PDFs of the signs.

Chemical containers

Chemical containers must be labeled in accordance with the requirements outlined in the UW Chemical Hazard Communication Program Manual.

Download chemical container labels from the RMS website and label all secondary chemical containers and chemical waste containers .

Piping systems

Piping systems must be labeled in ac cordance with the requirements outlined in the UW Chemical Hazard Communication Program Manual.

Local fire codes require that piping systems conveying hazardous mater ials are labeled in accordance with ANSI/ASME 13.1 Scheme for Identification of Piping Systems (shown below) and the UW Facility Design Standards for mechanical systems .

Instructions: Verify all piping systems in the shop are correctly labeled.

Figure 8 ANSI 13.1 Piping marking colors – updated 2007 standard

Color combinations	Hazardous material (New standard: ASME A13.1-2007, R2013)	Hazardous material (Old standard: ASME A13.1-1996, R2002)
WHITE on RED	Fire quenching fluids	Fire quenching fluids
BLACK on ORANGE	Toxic and corrosive fluids	
BLACK on YELLOW	Flammable fluids	Hazardous materials Flammable or explosive Chemically active or toxic Extreme temperatures or pressures Radioactive
WHITE on BROWN	Combustible fluids	
WHITE on GREEN	Potable, cooling, boiler feed, and other water	Low hazard materials
WHITE on BLUE	Compressed air	Low hazard gases
WHITE on PURPLE	User defined	
BLACK on WHITE	User defined	
WHITE on GRAY	User defined	
WHITE on BLACK	User defined	