Central Michigan University

Shop Safety Policy

1/1/2014

Central Michigan University Shop Safety Program and Practices

PURPOSE

This program establishes safe work practices for students, staff, and visitors working in any academic, Facilities Management or Residence Life shop. It defines safety guidelines, training requirements, and response procedures for emergency incidents to minimize injuries and illness when working in a shop.

SCOPE

This program covers all Central Michigan University shops irrespective of their location or department.

INTRODUCTION:

Shops are present in many departments and academic laboratories and are used by faculty, staff, students, alumni, and visitors. Shop equipment and tools are routinely used to complete various projects that, if not handled properly, may result in serious injury or death. The purpose of this program is to provide a basic overview of the common hazards associated with the use of hand/power tools and equipment found in shops, laboratories or otherwise; to establish fundamental shop safety rules; outline the use of safe work practices, and use of proper personal protective equipment.

It is the responsibility of the shop supervisor, faculty member, or their designee to provide hand and power tool, machine and equipment-specific safety training with a copy of the documentation forwarded to the Environmental Health & Safety department in Smith Hall 103. Documentation of this training is to be maintained by the respective department, also. A training template example is at the end of this document. Employee awareness of potential hazards combined with proper safety procedures can reduce accidents and injuries significantly. It is of vital importance that supervisors, faculty, or their designee become familiar with the components of this program that pertain to the operations under their control. Safety is a shared responsibility that involves the cooperation and support of the University, the users, and staff. It should be understood that these are minimum standards that apply to all University shops on campus. More detailed shop specific rules may also be developed by shop supervisors and departments based on their particular activities within the shop.

It is not possible to detail all the risks involved with shop work; however, it is possible to foresee many hazards by carefully planning each job. To prevent accidents and injury, shop users must utilize their knowledge, training, and common sense.

RESPONSIBILITIES

Department

1. Must inform all shop users to follow Central Michigan University's Shop Safety Program.
2. Must provide adequate resources for maintenance, repairs, and safe guarding equipment.
3. Enforces all safety rules.

Environmental Health & Safety

1. Responsible for reviewing and updating this program.
2. Collaborate with shops personnel on training requirements where necessary.
3. Responsible for conducting periodic audits and inspections of various shops.

Supervisors, Faculty or Designee

1. Responsible for being familiar with all procedures for safe use and guarding of machines, hand and powered tools, equipment, personal protective equipment required, and must ensure that all users of a machine shop are familiar with the components of this program.
2. Must provide tool/equipment specific training to all persons who will use the shop prior to working with shop tools/equipment. Must maintain documentation of tool/equipment specific training.

Users

Persons working in a shop should avoid doing so alone. Working alone in a shop with potentially hazardous equipment is never a good idea. If the supervisor, faculty member, or other designated employee determines that work must be done under these conditions, the hazards should be assessed, contingencies thought out and discussed, and the work approved only if the chances of injury are minimal.

1. If possible, use the "buddy system" when working in the shop.
2. Must complete all required safety training.
3. Must observe all shop safety rules when working in the shop.
4. Must wear all required PPE when working in the shop.
5. Must observe all shop-specific rules/regulations beyond the scope of this program.
6. Must report all injuries to a shop supervisor promptly, regardless of severity.
7. Must promptly report unsafe conditions, damaged or defective equipment to shop supervisor.
8. Seek further guidance on any machine/equipment and or safety related issues that are unclear.
9. Work with the shop supervisor, faculty, or designee if there are specific needs for your work.

PROCEDURE

Emergency Contacts

CMU Police:	911 from campus phone or 774-3081
Shop Supervisor	xxx-xxxx
Facilities Management:	774-6547
Risk Management/Environmental Health & Safety:	774-7398

Shop Access (after hours)

Only authorized persons who have been trained in all aspects of this shop program will be allowed access to the shop after regular business/classroom hours. All safety guidelines must be adhered to while using the shop. Misuse of equipment/tools and or disregard for the shop safety guidelines should be reported to the person in charge of the shop as soon as possible. Report as soon as possible if tools or equipment are in need of repair. Never use a defective tool or piece of equipment. Make all adjustments to equipment while power is off and while blades, bits, etc. are NOT moving. If an accident occurs, immediately summon help for an injured person by dialing 911 from any campus phone or 774-3081 if using a cell phone, and then call the person in charge of the shop regardless of the time of day.

When finished working in the shop, users must clean up the equipment that was used and the surrounding area, return tools to their proper place, and make certain the door to the shop is closed and locked upon leaving.

SHOP HAZARDS

Hazardous Mechanical Motions and Actions

A wide variety of mechanical motions and actions may present hazards to persons working in the shop. These can include the movement of rotating members, reciprocating arms, moving belts, meshing gears, cutting teeth, and any parts that impact or shear. These different types of hazardous mechanical motions and actions are basic to nearly all machines and recognizing them is an important first step in protecting an individual from the dangers. The basic types of hazardous mechanical motions and actions are:

Motions:

1. **Rotating** (including in-running nip points): Even smooth, slowly rotating shafts can grip clothing, and through mere skin contact, force an arm or hand into a dangerous position. Injuries due to contact with rotating parts can be severe. Collars, couplings, cams, clutches, flywheels, shaft ends, spindles, and horizontal or vertical shafting are some examples of common rotating mechanisms which may be hazardous. The danger increases when bolts, nicks, abrasions, and projecting keys or set screws are exposed on rotating parts. In-running nip point hazards are caused by rotating parts on machinery. There are three main types of in-running nips:
    I. Parts can rotate in opposite directions while their axes are parallel to each other. These parts may be in contact (producing a nip point) or in close proximity to each other. In the latter case the *stock* fed between the rolls produces the nip points. This danger is common on machinery with intermeshing gears, rolling mills, and calendars.
    II. Another nip point is created between rotating and tangentially moving parts. Some examples include: the point of contact between a power transmission belt and its pulley, a chain and a sprocket, or a rack and pinion.
    III. Nip points can occur between rotating and fixed parts which create a shearing, crushing, or abrading action. Examples include: spoked hand wheels or flywheels, screw conveyers, or the periphery of an abrasive wheel and an incorrectly adjusted work rest.

Figure 1.

Examples of Typical Rotating Mechanisms

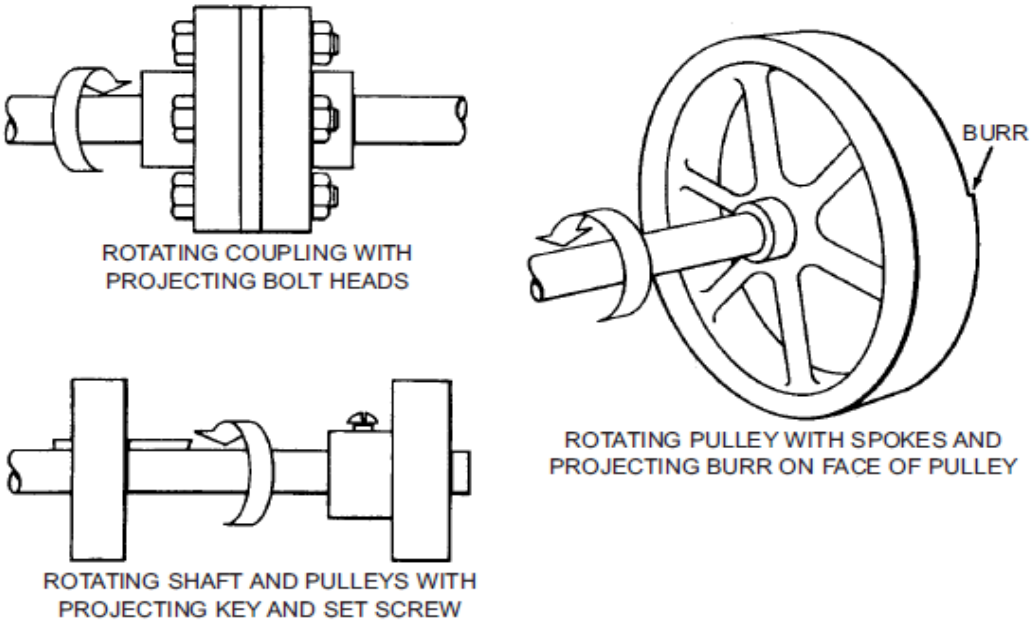


Figure 2.

Examples of In-running Nip Points—Parallel Axes, Rotation in Opposite Directions

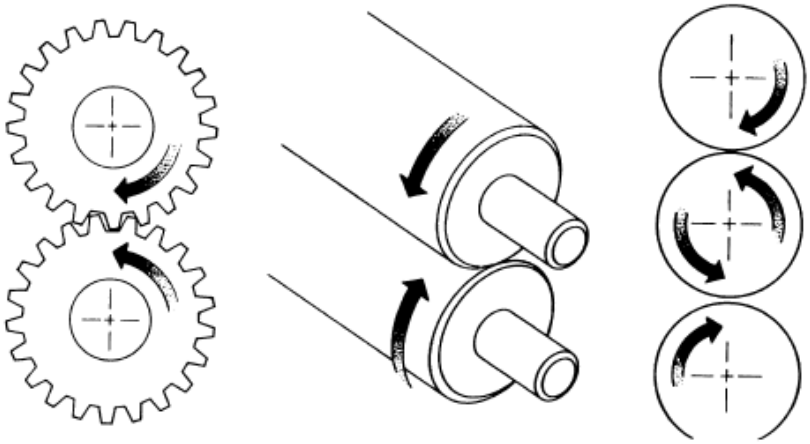


Figure 3.

Examples of In-running Nip Points—Rotating and Tangentially Moving Parts

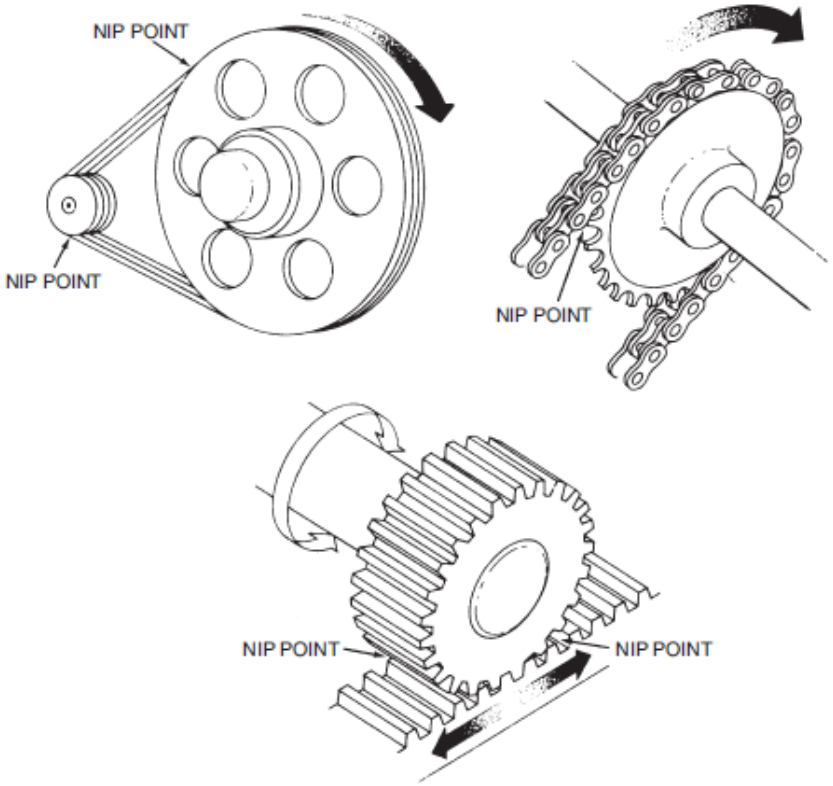
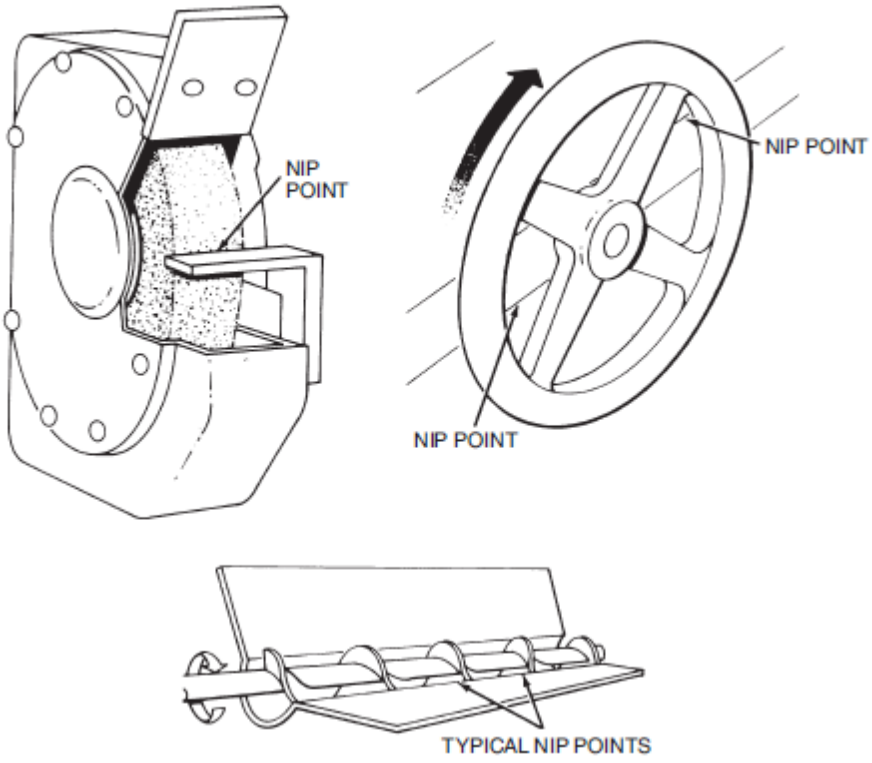


Figure 4.

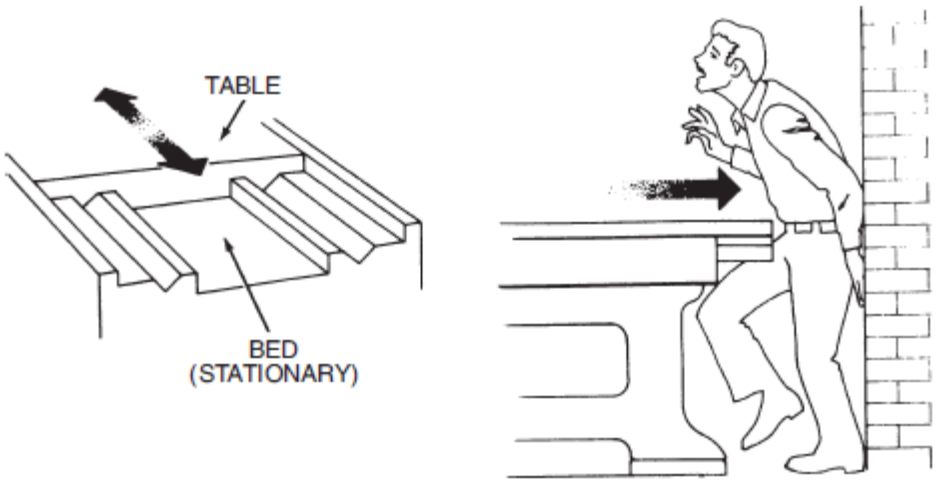
Examples of In-Running Nip Points—Shearing, Crushing, Abrading Actions



2. **Reciprocating** motions are hazardous because during the back-and-forth or up-and-down motion, a worker may be struck by or caught between a moving and a stationary part.

Figure 5.

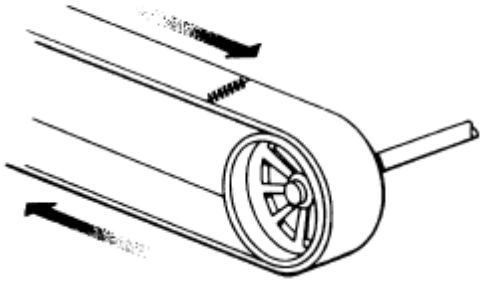
Example of a Reciprocating Motion



3. **Transverse** motions (movement in a straight, continuous line) creates a hazard because a worker may be struck or caught in a pinch or shear point by the moving part.

Figure 6.

Example of a Transverse Motion

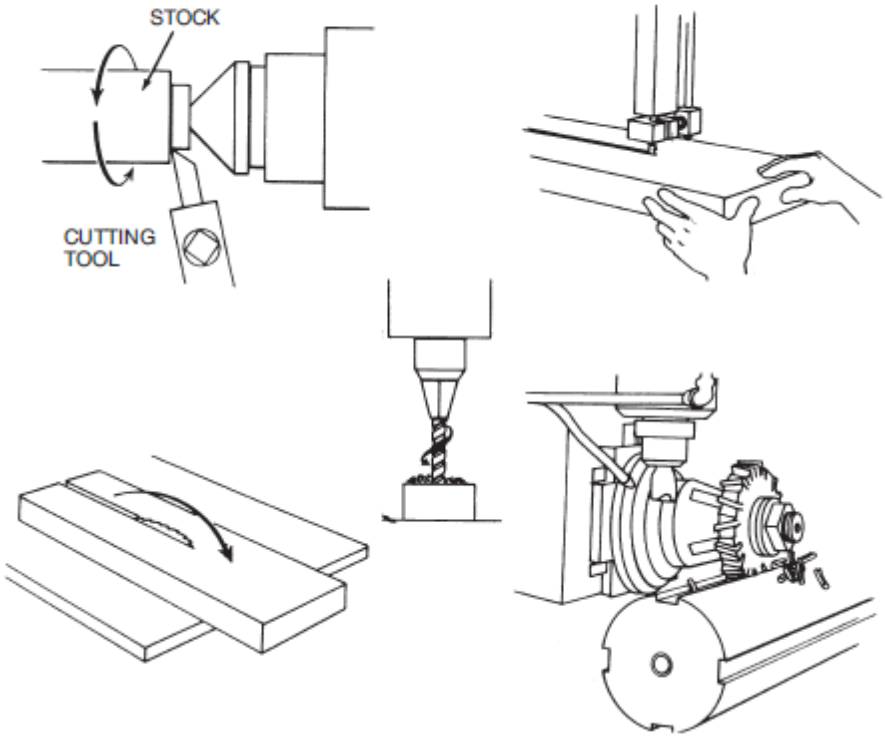


Actions:

1. **Cutting** actions involve rotating, reciprocating, or transverse motions. The danger of cutting actions exist at the point of operation where finger, head, and arm injuries can occur and where flying chips or scrap material can strike the eyes or face. Such hazards are present at the point of operation in cutting wood, metal, or other materials. Typical examples of mechanisms involving cutting hazards include band saws, circular saws, boring or drilling machines, turning machines (lathes), or milling machines.

Figure 7.

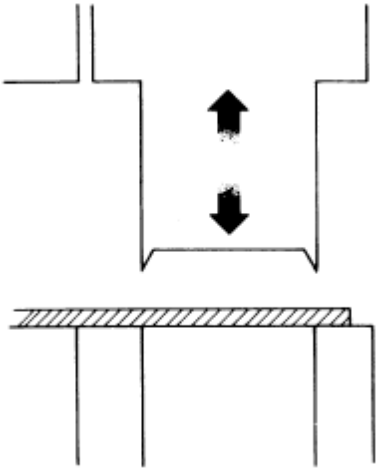
Examples of Cutting Actions That Can Present Hazards



2. **Punching** actions result when power is applied to a slide (ram) for the purpose of blanking, drawing, or stamping metal or other materials. The hazard from this type of action occurs at the point of operation where stock is inserted, held, and withdrawn by hand. Examples of machinery used for punching operations are power presses and ironworker machines.

Figure 8.

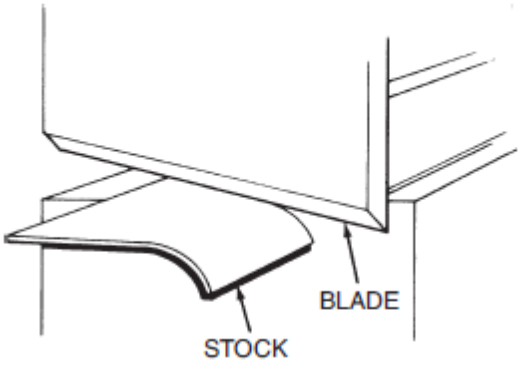
Example of a Punching Operation



3. **Shearing** action involves applying power to a slide or knife in order to trim or shear metal or other materials. The hazard occurs at the point of operation where stock is actually inserted, held, and withdrawn. Examples of machinery used for shearing operations are mechanically, hydraulically, or pneumatically powered shears.

Figure 9.

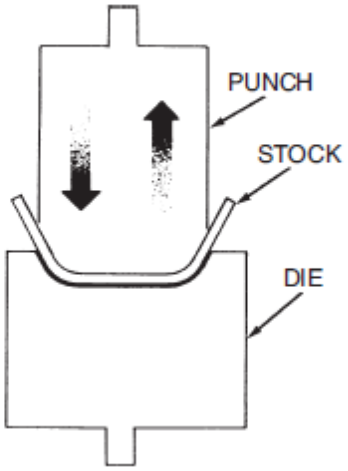
Example of a Shearing Action



4. **Bending** actions result when power is applied to a slide in order to draw or stamp metal or other materials, and a hazard occurs at the point of operation where stock is inserted, held, and withdrawn. Equipment that uses bending actions include power presses, press brakes, and tubing benders.

Figure 10.

Example of a Bending Operation



Spray Paint Booths

When working with paint or painting equipment, it is important to have adequate ventilation and to avoid flames or other sources of ignition. Because most paints, varnishes, and thinners are flammable, spray paint jobs should be conducted in a well-ventilated enclosure such as a spray paint booth. Spray paint booths minimize toxic vapors and flammable fumes while providing adequate ventilation. Always wear personal protective equipment when working with paint and varnishes. Read the Safety Data Sheet (SDS) provided by the product manufacturer. In addition, change filters, clean the booths and ventilation ducts frequently to avoid heavy accumulations of paint, dust, and pigment.

Welding and Cutting

Welding and cutting are two forms of hot work that require special safety considerations. Common hazards associated with welding and cutting include the following:

1. Electrocution
2. Burns
3. UV radiation exposure
4. Oxygen depletion
5. Sparking
6. Metal fume inhalation

Before conducting welding or cutting operations, inspect the equipment for the following:

1. Welding power and ground cables are sized properly for the current required
2. Welding cable and electrode holder are in good condition (i.e. electrical connections are not frayed, cables and insulation are not damaged, cut, nicked, etc.)
3. Torches are leak-free and equipped with proper fittings, gauges, regulators, and flashback devices.
4. All compressed gas cylinders are secured with non-combustible restraints to keep the cylinders from falling if bumped. All compressed gas cylinders are capped when not in use.

In addition, follow these guidelines for welding and cutting operations (various departments, for example, Art & Design, may also have Standard Operating Procedures (SOP's) specific to the type of welding or cutting activity):

1. Wear proper PPE; it is important that the welding helmet visor is dark enough to provide adequate protection. Wear flame resistant jacket, head/hair protection, and protective hand and footwear appropriate for the welding task.
2. Conduct welding and cutting operations in an area designated for the task. There should be signage that designates a welding area.
3. Keep suitable fire extinguishing equipment nearby and know how to operate it.
4. Take precautions to protect other people from the hazards of welding. If possible, use a welding curtain.
5. Do not use electric welders and cutting tools in a wet area.

Foundry Work

The methods and materials involved in metal casting operations are highly hazardous. It is important to understand proper safety precautions before attempting any metal casting. Not following these precautions could cause injury or death, either to you or someone else. Common hazards and precautions include, but are not limited to the following:

1. Moisture and molten metal DO NOT mix. Even trace amounts of moisture in contact with molten metal can cause an explosion, which can lead to serious injury or death.
2. NEVER put water on a metal fire.
3. Have a DRY pile of sand and a shovel ready to put out fires or to control metal spills.
4. Have a sand layer at least 1 inch thick under all areas. This will help contain metal spills and protect flooring.
5. Never pour molten metal over wet ground. Again, even trace amounts of moisture can cause explosions.
6. Molten metal spilled on concrete will cause the concrete to explode. Use a thick sand layer over concrete.
7. Always use clean metal as feedstock. Combustion residues from some lubricants and paints can be toxic.
8. Always operate in a well-ventilated area. Fumes and dusts from combustion and other foundry chemicals, processes, and metals can be toxic.

9. Never use a crucible that has been damaged or dropped.
10. Adding cold metal to a hot crucible is dangerous. Hot crucibles can be safety charged as long as metal charges are preheated. If there is any moisture on the metal, even just a haze, the metal can cause the entire contents of the crucible to explode. Refer to the specific process SOP for further instructions.
11. Spilled molten metal can travel for a great distance. Operate in a clear work area.
12. Think about what you are doing at all times. Focus on the job at hand and the next step. Have all moves planned and rehearsed prior to any operation.
13. Clothes and shoes should be made from cotton or natural fibers. Synthetics melt and stick to the skin. Wear appropriate PPE. This includes, but is not limited to:
    a. Leather shoes
    b. Fireproof foundry jacket (leather or aluminized fabric) with apron over top.
    c. Proper foot and leg protection
    d. Proper hand protection
    e. Helmet with mesh face shield
    f. Safety glasses
    g. Cotton or nomex foundry hat
    h. Long sleeved cotton shirt
14. During a pour, observers must stand at a safe distance from the pit. Based on the type of pour, this distance will be determined by the supervisor, faculty, or designee.
15. Do not distract anyone during a pour.
16. Do not look into the furnace or kilns without a wire mesh shield or appropriate eye protection for splattering and infrared radiation.

Applicable MIOSHA Regulations

MIOSHA Part 1 A: Abrasive Wheels

MIOSHA Part 7: Guards for Power Transmission

MIOSHA Part 12: Welding and Cutting

MIOSHA Part 23: Hydraulic Power Presses

MIOSHA Part 24: Mechanical Power Presses

MIOSHA Part 26: Metal Working Machinery

MIOSHA Part 27: Woodworking Machinery

MIOSHA Part 33: Personal Protective Equipment

MIOSHA Part 38: Hand and Portable Power Tools

MIOSHA Part 44: Foundries

MIOSHA Part 76: Spray Finishing Using Flammable and Combustible Materials

SHOP SAFETY GUIDELINES/RULES

1. Do not use any machine until you have been trained and are knowledgeable on its safe use.
2. Approval to operate shop tools/power equipment must be obtained prior to use.
3. When possible, use the buddy system when working in the shop.
4. After hours use must first be approved by the supervisor, faculty, or their designee.
5. Never work when you are impaired, tired, stressed or otherwise unable to work carefully.
6. Always wear eye protection with side shields around equipment or in a shop, even if you are not using the equipment.
7. Always wear closed-toed shoes appropriate for the task at hand. Sandals, clogs, crocks, and high heels should not be worn.
8. Always tie back long hair, including long beards so that hair does not hang in front of the neck/face.
9. Never wear loose-fitting clothing, jewelry (including rings, necklaces, bracelets, wristwatches, etc.) or anything else that could get caught in the machinery.
10. Cell phone use and portable music players with headphones are prohibited while working in the shop.
11. Never place hands in the area of any cutting head, drill, or other rotating or cutting device/tool.
12. All guards/shields must be secured and in place prior to operating equipment. Never remove guarding/shielding.
13. Never leave a machine while it is running.
14. Always remove wrench or tightening devices prior to starting the machine.
15. Never walk directly behind a person who is operating machinery. Wait until the operator is finished or seek an alternate route.
16. Never interrupt or distract a person while they are operating equipment. Wait until the operator is finished.
17. Always check wood for screws or other embedded metal objects before cutting or machining.
18. Always alert others to malfunctioning equipment by turning it off, placing an “Out of Order” sign on the equipment, and informing the supervisor, faculty, or designee responsible for the equipment.
19. Never use damaged or defective tools/equipment.
20. Keep work area clean. Remove chips and waste pieces from floor, but do not handle chips with bare hands/fingers. Clean spills from floor immediately.
21. Compressed air must not be used to clean skin or clothing.
22. Aisles, exits, and access to emergency equipment must be kept clear at all times.
23. Food and drinks are permitted in designated areas only.
24. Report all injuries or near misses to the supervisor, faculty, or designee immediately or as soon as possible if after hours.
25. Supervisor, faculty, or designee has full authority over the shop and its safe use, including the responsibility, authority, and obligation to prohibit shop or tool access for the safety of those in the shop.

Emergency Contact(s)

CMU Police:	911 from campus phones – or 774-3081
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Facilities Management:	774-6547
Risk Management/Environmental Health & Safety:	774-7398

SHOP SAFETY GUIDELINES/RULES-Signature Page

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I have read and understand the above shop safety guidelines/rules.

Signature:_____

Date:_____

Central Michigan University

Machine Specific Training Record Form

The individual listed below has satisfactorily been trained on the safe use and operation of the specified shop equipment.

EMPLOYEE/STUDENT NAME	CMU EMPLOYEE/STUDENT ID NUMBER	Shop Equipment Trained On (Make separate entry for each piece of equipment	DATE	EMPLOYEE/STUDENT SIGNATURE	SHOP SUPERVISOR SIGNATURE

Tool Safeguarding and Controls

Tool Type	Size/Style	Power	Potential Hazards	Power Controls	Emergency Stopping	Shields and Guards	Other Protective Measures
Band Saw / Small	Bench	Electric	Cutting blade-minor lacerations Rotating blade pulleys-pinch points, minor -entanglement Flying objects-eye, face, skin injuries	Anti-restart for wood	E-Stop, accessible single action hand switch, or foot switch	Blade Covered pulleys	Push sticks Fence
Band Saw / Large	Standing	Electric	Cutting blade-minor lacerations Rotating blade pulleys-pinch points, minor entanglement Flying objects-eye, face, skin injuries	Anti-restart for wood	E-Stop, accessible single action hand switch, or foot switch	Blade plus extension if needed Fully encased bandsaw wheels	Smallest opening in work surface possible
Buffer, Wheel	Bench or Standing	Electric	Rotating parts-entanglement Flying objects-eye, face, skin injuries Parts pulled/thrown from hand – flying objects		E-stop, accessible single action hand switch, or foot switch	Rotating shaft and nut guards as feasible	Clamps for holding small parts
Drill/Grinder Sharpener	Bench or Standing	Electric	Rotating shaft and wheel-pinch points, abrasions Flying objects-eye, face, skin injuries Heat/Sparks –burns, fire		E-stop, accessible single action hand switch, or foot switch	Wheel Chip shield as feasible	Bit vise/Clamp Faceshield if excessive flying objects expected
Drill Press/Small	Bench	Electric	Sharp cutting bit-minor lacerations, punctures Rotating chuck and bit-minor entanglement Flying objects-from parts working or from thrown chuck key part-eye face, skin injuries Torque exerted on work piece-impact injuries	Anti-restart for wood	E-stop, accessible single action hand switch, or foot switch	Covered pulley head Portable chuck/chip Rear shielding as needed	Vise-secured Spring-loaded chuck key Work/tool rest
Drill Press/Large	Standing	Electric	Sharp cutting bit-minor lacerations, punctures Rotating chuck and bit-minor entanglement Flying objects-from parts working or from thrown chuck key, part-eye face, skin injuries Torque exerted on work piece-impact injuries	Anti-restart for wood	E-stop, accessible single action hand switch, or foot switch	Covered pulley head Affixed multi-plane chuck/chip Rear shielding as needed	Vise-secured Spring-loaded chuck key Hearing protection for high pitch metal cutting
Grinder(hard wheels)	Bench or Standing	Electric	Rotating shaft and wheel-pinch points, abrasions Flying objects-parts or wheel shatter-eye, face, skin injuries Heat/sparks-burns, fire		E-stop, accessible single action hand switch, or foot switch	Wheel enclosure Upper tongue Chip shield Rear shielding as needed	Work/tool rest Warning label with gap tolerances Depth/feeler gauges at all grinder stations

Tool Type	Size/Style	Power	Potential Hazards	Power Controls	Emergency Stopping	Shields and Guards	Other Protective Measures
Jointer	Bench or Standing	Electric	Sharp cutting heads-serious lacerations, amputation Rotating (horizontal) parts-minor entanglement Flying objects-eye, face, skin injuries	Anti-restart for wood	E-stop, accessible single action hand switch, or foot switch	Cutter shield	Push sticks and blocks
Wood Lathe	Bench or Standing	Electric	Rotating parts-serious entanglement Flying objects-from parts working or thrown chuck key, part-eye face, skin injuries Sharp cutting tools-lacerations Pinch points-crushing, bruising	Anti-restart	E-stop, accessible single action hand switch, or foot switch	Chuck Workpiece/point of operation	Tool rest Faceshield if point of operation shield not possible
Metal Lathe	Mini Bench	Electric	Rotating parts-minor entanglement Flying objects-eye, face, skin injuries Sharp cutting tools-lacerations Pinch points-minor crushing, bruising		E-stop, accessible single action hand switch, or foot switch	Portable shield	
Metal Lathe	Bench or Standing	Electric	Rotating parts-serious entanglement Flying objects-from parts working or thrown chuck key,part-eye, face, skin injuries Sharp cutting tool-lacerations Pinch points-crushing, bruising Heat-burns	Anti-restart	E-stop, accessible single action hand switch, or foot switch Emergency foot brake/power stop	Chuck (interlock preferred) Cross-slide shield Lead screw as feasible Drive shaft(s) (as feasible) Bar feeder cover (if present) Rear shielding as needed	Spring-loaded chuck wrenches
Planer	Bench or Standing	Electric	Sharp cutting heads-serious lacerations, minor amputations Rotating horizontal parts-minor entanglement Flying objects-eye, face, skin injuries	Anti-restart for wood	E-stop, accessible single action hand switch, or foot switch	Adjustable entry/feed Cutting head	Push sticks Outfeed support Hearing protection for high noise planning
Radial Arm Saw	Bench	Electric	Sharp cutting blade-serious lacerations and amputations Flying objects-eye, face, skin injuries Rotating shaft/blade-minor entanglement	Anti-restart	E-stop, accessible single action hand switch, or foot switch	Top enclosed blade cover Blade (self-adjusting)	Auto retraction Fence Clamps Faceshield if excessive flying objects expected
Sander,Belt (vertical or horizontal)	Bench or Standing	Electric	Flying objects-eye, face, skin injuries Rotating pulleys, belts-entanglement Pinch points-crushing, bruising	Anti-restart	E-stop, accessible single action hand switch, or foot switch	Pulleys Rollers (both sides) Area below tool rest	Tool rest
Sander, Wheel	Bench or Standing	Electric	Flying objects-eye, face, skin injuries Rotating pulleys, belts entanglement Pinch points-crushing, bruising	Anti-restart for wood	E-stop, accessible single action hand switch, or foot switch	Pulleys Side	Tool rest

Tool Type	Size/Style	Power	Potential Hazards	Power Controls	Emergency Stopping	Shields and Guards	Other Protective Measures
Saw, Miter/Compound Miter Chop-Style Saw	Bench	Electric	Sharp cutting blade-lacerations, amputations Rotating blade-minor entanglement Flying objects-eye, face, skin injuries Heat/sparks-burns, fire	Finger/constant pressure switch		Blade (self-adjusting)	Auto return Fence Clamps
Shaper/Inverted Router (Table)	Bench or Standing	Electric	Sharp cutting tool-lacerations, minor amputation Rotating tool-minor entanglement Flying objects-eye, face, skin injuries	Anti-restart for wood	E-stop, accessible single action hand switch, or foot switch	Cutting tool guard	Fence Pushsticks
Shear/Cutter	Bench or Standing	Manual	Sharp cutting blade-serious lacerations, amputations Caught between-crushing			Blade	Warning label
Table Saw	Contractor or Full/Panel	Electric	Sharp cutting blade-serious lacerations or amputation Rotating blade-minor entanglement Flying objects-eye, face, skin injuries	Anti-restart for wood	E-stop, accessible single action hand switch, or foot switch	E-stop	

Shop Inspection Checklist		Environmental Health & Safety Smith 103 774-7398
Location:	**Date:**	
Shop Supervisor:	**Inspector:**	
Department:		

				STATUS			
ADMINISTRATIVE	**YES**	**NO**	**N/A**	**IN PROGRESS**	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
1. Are training records maintained to indicate which employees are trained and qualified to use each power tool, piece of equipment, or machine?							
CORRECTIVE ACTION: Establish a training file. Prohibit personnel from using power tools and equipment that they have not been trained on. **Completion Date:** _____							
2. Is an operator's manual, Job Safety Analysis, or other written safe operating procedure(s) available for each power tool, piece of equipment, and machine?							
CORRECTIVE ACTION: Obtain operator's manuals from the manufacturer, or write safe operating procedures for each power tool, piece of equipment, and machine. Contact Environmental Health & Safety at 774-3313 for assistance. **Completion Date:** _____							
3. Is the Central Michigan University Emergency Guideline Quick Chart posted?							
CORRECTIVE ACTION: Post Emergency Guideline Quick Chart in the shop(s) in a visible location, preferably by a telephone if available. Obtain quick charts from Environmental Health & Safety, 774-7398. **Completion Date:** _____							
4. Are building evacuation routes clearly posted, and are all exits marked with exit signs?							
CORRECTIVE ACTION: Contact Environmental Health & Safety, 774-7398 for assistance. **Completion Date:** _____							

				STATUS			
HOUSEKEEPING	**YES**	**NO**	**N/A**	**IN PROGRESS**	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
1. Are work areas (including equipment and machinery) kept clean and orderly, so as to prevent trip and fire hazards?							
CORRECTIVE ACTION: Include housekeeping as part of regular shop activities (i.e. work is not finished until all tools and materials are put away, the work area swept and waste is properly disposed of). **Completion Date:** _____							
COMMENTS:							

Shop Inspection Checklist		Environmental Health & Safety Smith 103 774-7398
Location:	**Date:**	
Shop Supervisor:	**Inspector:**	
Department:		

				STATUS			
HOUSEKEEPING	**YES**	**NO**	**N/A**	**IN PROGRESS**	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
2. Have employees been advised that they are not to consume food or drinks in shop areas unless there is a designated clean area?							
CORRECTIVE ACTION: Prohibit consuming food or beverages in shop areas; post signs if necessary. **Completion Date:** _____							
3. Are floors and work surfaces clean and dry and/or made slip-resistant?							
CORRECTIVE ACTION: Keep surfaces dry or install slip-resistant material on surfaces that cannot be kept dry. Contact Facilities Management 774-6547 for assistance. **Completion Date:** _____							
4. Are there written procedures for immediate clean-up of all spilled materials?							
CORRECTIVE ACTION: Establish and enforce procedures for immediate clean-up of all spilled materials. Contact Environmental Health & Safety, 774-7398 for assistance. **Completion Date:** _____							
5. Dust collection system is installed and operable for all dust generating tools and machinery.							
CORRECTIVE ACTION: Install/repair system if possible. If dust collection system is not employed, all horizontal surfaces must be kept free of dust accumulation to less than 1/16 of an inch (1.6mm) **Completion Date:** _____							
6. Do all work areas have adequate ventilation, particularly for hazardous operations (i.e. welding, soldering, spray coating, using solvents)?							
CORRECTIVE ACTION: Contact EHS 774-7398 to have ventilation evaluated if there is a concern. Provide additional exhaust ventilation for operations that create dust, fumes, mists, or vapors. **Completion Date:** _____							
COMMENTS:							

Shop Inspection Checklist		Environmental Health & Safety Smith 103 774-7398
Location:	**Date:**	
Shop Supervisor:	**Inspector:**	
Department:		

				STATUS			
HOUSEKEEPING	**YES**	**NO**	**N/A**	**IN PROGRESS**	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
7. Do all work areas have adequate illumination?							
CORRECTIVE ACTION: Contact Environmental Health & Safety, 774-7398 to have lighting evaluated if there is a concern. Contact Facilities Management, 774-6547, to repair broken lighting. **Completion Date:** _____							
8. Is there a procedure for removing damaged, broken, unguarded tools, or equipment from service?							
CORRECTIVE ACTION: Establish procedures such as using "out of service" tags to identify and prevent the use of dangerous items. **Completion Date:** _____							
9. Storage areas are easily accessible and organized with no protruding items/clutter.							
CORRECTIVE ACTION: Establish and enforce procedures for keeping storage areas neat and organized. **Completion Date:** _____							
10. Trash recepticles are not overflowing.							
CORRECTIVE ACTION: Establish and enforce procedure for ensuring trash is emptied regularly. **Completion Date:** _____							
11. All exits and passageways are unobstructed.							
CORRECTIVE ACTION: Establish and enforce procedures for keeping exits and passageways unobstructed. **Completion Date:** _____							

COMMENTS:

Shop Inspection Checklist				Environmental Health & Safety Smith 103 774-7398			
Location:	**Date:**						
Shop Supervisor:	**Inspector:**						
Department:							
				STATUS			
HOUSEKEEPING	**YES**	**NO**	**N/A**	**IN PROGRESS**	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
12. Ladders are maintained in safe operating condition and properly stored.							
CORRECTIVE ACTION: Ensure that ladders are inspected prior to each use and damaged ladders are removed from service immediately. **Completion Date:** _____							
				STATUS			
FIRE/EMERGENCY SAFETY	**YES**	**NO**	**N/A**	**IN PROGRESS**	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
1. Are fire alarm pull boxes clearly identified and unobstructed?							
CORRECTIVE ACTION: Ensure that all fire alarm pull boxes are clearly labeled. Clear any obstructions in front of fire alarm pull boxes. **Completion Date:** _____							
2. Fire extinguishers are present, unobstructed, and readily identifiable.							
CORRECTIVE ACTION: Ensure that all fire extinguishers are clearly identifiable. Clear any obstructions in front of fire extinguishers. **Completion Date:** _____							
3. Portable fire extinguishers are tagged with inspection tags and punch-dated.							
CORRECTIVE ACTION: Contact Environmental Health & Safety, 774-7398 if they have not been inspected within the last 12 months and/or if the gauge indicates less than fully charged. **Completion Date:** _____							
COMMENTS:							

Shop Inspection Checklist		Environmental Health & Safety Smith 103 774-7398
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Shop Supervisor:	**Inspector:**	
Department:		

				STATUS			
FIRE/EMERGENCY SAFETY	**YES**	**NO**	**N/A**	**IN PROGRESS**	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
4. Emergency eyewashes/showers for the shops are tested/flushed monthly, with the tests documented.							
CORRECTIVE ACTION: Contact Environmental Health & Safety, 774-7398 for assistance. **Completion Date:** _____							
5. Eyewash and shower station(s) are free of obstructions that would prevent quick access by someone temporarily blinded.							
CORRECTIVE ACTION: Remove all obstructions from emergency eyewashes and showers. **Completion Date:** _____							
6. Flammable materials are stored in approved safety containers or safety cabinets.							
CORRECTIVE ACTION: Ensure that all flammable materials are stored in approved safety containers or cabinets. Prohibit storage of flammable materials outside safety containers or cabinets. **Completion Date:** _____							
7. Flammable gas cylinders and oxygen cylinders are separated by a fire-rated wall or at least 20 ft.							
CORRECTIVE ACTION: Separate flammable gases from oxygen by a fire wall or a distance greater than 20 ft. Temporary storage of welding carts with oxygen and acetylene is permitted. **Completion Date:** _____							
8. Are covered metal containers used for oily and paint soaked waste?							
CORRECTIVE ACTION: Ensure that covered metal containers are provided and used for the disposal of oily and paint soaked rags. **Completion Date:** _____							
COMMENTS:							

Shop Inspection Checklist				Environmental Health & Safety Smith 103 774-7398			
Location:	**Date:**						
Shop Supervisor:	**Inspector:**						
Department:							
				STATUS			
FIRE/EMERGENCY SAFETY	**YES**	**NO**	**N/A**	**IN PROGRESS**	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
9. Combustible materials are kept at least 35 feet away from welding operations, or fireproof covering is provided.							
CORRECTIVE ACTION: Move combustible material at least 35 feet from welding operations or place fireproof covering over them. **Completion Date:** _____							
				STATUS			
ELECTRICAL SAFETY	**YES**	**NO**	**N/A**	**IN PROGRESS**	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
1. Electrical panels are accessible, covers in place on recepticles, boxes, switches, and circuit breakers are clearly labeled.							
CORRECTIVE ACTION: Ensure that there is a minimum of 36 inches of clearance in front of all electrical panels, and label each circuit breaker with its use. **Completion Date:** _____							
2. Shop equipment and power tools are properly grounded or double insulated. Grounding pins have not been removed, and 3-pin to 2-pin adapters are not being used.							
CORRECTIVE ACTION: Inspect all electrical connections for grounding plugs or wires. Check manufacturer specifications to ensure that power tools are double insulated if not grounded. **Completion Date:** _____							
3. Extension cords and power strips are in good condition (i.e., no breaks or exposed wiring), used only as temporary wiring (<30 days), and are not connected in series.							
CORRECTIVE ACTION: Remove all extension cords connected in series, permanent use power strips, and permanent use extenstion cords. Contact Facilities Management, 774-6547 to arrange for installation of permanent wiring if needed. Dispose of or repair all electrical cords that are not in good condition. **Completion Date:** _____							
COMMENTS:							

Shop Inspection Checklist				Environmental Health & Safety Smith 103 774-7398			
Location:	**Date:**						
Shop Supervisor:	**Inspector:**						
Department:							
				STATUS			
ELECTRICAL SAFETY	**YES**	**NO**	**N/A**	**IN PROGRESS**	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
4. Electrical tools and appliances used in or near wet areas (such as sinks) are protected with Ground Fault Circuit Interrupters (GFCIs).							
CORRECTIVE ACTION: Install GFCI protection in/near wet areas. Use an in-line (plug attached) GFCI for locations where permanent GFCI outlets are unavailable. These are available at local hardware stores. **Completion Date:** _____							
5. Campus lockout/tagout program is in place (where required) to prevent accidental energizing of equipment, machines, or electrical systems that are being repaired, adjusted, or undergoing maintenance.							
CORRECTIVE ACTION: Institute a lockout/tagout program. Contact Environmental Health & Safety, 774-7398 for assistance. **Completion Date:** _____							
				STATUS			
PERSONAL PROTECTIVE EQUIPMENT	**YES**	**NO**	**N/A**	**IN PROGRESS**	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
1. Employees are provided with eye and face protection such as safety glasses and face shields where needed.							
CORRECTIVE ACTION: Provide and ensure the use of approved eye protection for all shop employees and visitors upon entry to shop area(s). Ensure that face protection is used when flying materials could cause injury to the face. **Completion Date:** _____							
COMMENTS:							

Shop Inspection Checklist		Environmental Health & Safety Smith 103 774-7398
Location:	**Date:**	
Shop Supervisor:	**Inspector:**	
Department:		

				STATUS			
PERSONAL PROTECTIVE EQUIPMENT	**YES**	**NO**	**N/A**	**IN PROGRESS**	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
2. Employees who work around inhalation hazards (i.e., chemical vapors, welding fumes, or dust) have been monitored to determine whether they need to be enrolled in the Respiratory Protection Program.							
CORRECTIVE ACTION: Contact Environmental Health & Safety to provide employee hazard assessments and determine the necessity for respiratory protection, or ventilation upgrades. **Completion Date:** _____							
3. Employees who work in noisy areas have been monitored to determine whether they need to be enrolled in the Hearing Conservation Program.							
CORRECTIVE ACTION: Contact Environmental Health & Safety, 774-3313 to provide employee noise monitoring and determine the necessity for hearing protection. Provide hearing protection to employees who request it. **Completion Date:** _____							

				STATUS			
HAND AND PORTABLE POWER OPERATED TOOLS	**YES**	**NO**	**N/A**	**IN PROGRESS**	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
1. All tools are free of defects (such as cracked handles) that make them unsafe.							
CORRECTIVE ACTION: Remove defective tools from service. **Completion Date:** _____							
2. All rotating and or moving parts of equipment or tools are guarded (i.e. hand-held grinder wheel).							
CORRECTIVE ACTION: Ensure that all guards are in place and used during tool operation. **Completion Date:** _____							
COMMENTS:							

Shop Inspection Checklist		Environmental Health & Safety Smith 103 774-7398
Location:	**Date:**	
Shop Supervisor:	**Inspector:**	
Department:		

				STATUS			
SHOP EQUIPMENT AND MATERIALS	**YES**	**NO**	**N/A**	**IN PROGRESS**	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
1. Shop rules have been discussed with all employees who work with the tools/equipment, etc.: a. Long hair is tied back and or up. No long ponytails that can become entangled in rotating equipment. b. No loose clothing; long sleeves are rolled to above the elbows. No neckties or ID badges that hang from the neck. c. No loose, dangling jewelry, bracelets, etc.							
CORRECTIVE ACTION: Train employees on the shop rules/hazards. **Completion Date:** _____							
2. Abrasive wheel grinders are equipped with a work rest adjusted to within 1/8" of the wheel. The tongue is adjusted to within 1/4" of the wheel. Side guards cover the spindle end, nut, and flange projections, as well as the periphery, other than where work is to be performed. Spindle speed permanently marked on machine and legible. No cracked/broken wheels.							
CORRECTIVE ACTION: Prohibit the use of wheel grinders until work rests and proper side guards are installed and or properly adjusted. Completion Date: _____							
3. Radial arm saws are provided with a spreader and automatic return.							
CORRECTIVE ACTION: Prohibit the use of radial arm saws until spreaders and automatic returns are installed. **Completion Date:** _____							
4. Table saws have a hand guard, spreader, and anti-kickback device for use when applicable. Push sticks are available for use as needed.							
CORRECTIVE ACTION: Prohibit the use of table saws until anti-kickback devices are installed. Provide pushsticks. **Completion Date:** _____							
COMMENTS:							

Shop Inspection Checklist		Environmental Health & Safety Smith 103 774-7398
Location:	**Date:**	
Shop Supervisor:	**Inspector:**	
Department:		

				STATUS			
SHOP EQUIPMENT AND MATERIALS	**YES**	**NO**	**N/A**	**IN PROGRESS**	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
5. All pieces of equipment and machinery are provided with adequate guarding. (Rotating parts, nip points, and v-belts must be guarded).							
CORRECTIVE ACTION: Prohibit the use of equipment and machinery until adequate guards are installed. **Completion Date:** _____							
6. All portions of band saw are enclosed except working portion of blade. Sliding blade guide within 1/4" of work piece. Band saw wheel is enclosed. Blade type and speed corresponds with material being worked.							
CORRECTIVE ACTION: Adjust sliding blade guide. Enclose all portions of saw blade. Ensure wheel is enclosed with solid material, wire mesh, or perforated material. **Completion Date:** _____							
7. All pulleys on Disc/Belt Sander are enclosed including sides and periphery. Operating controls are guarded to prevent accidental actuation. Edges of unused run of the belt are guarded. Guards in place to prevent hands/fingers from contact with nip point. Belt in good condition-not ripped or torn.							
CORRECTIVE ACTION: Ensure pulleys are enclosed. Ensure operating controls are guarded. Ensure edges of unused belt are guarded. Ensure guards are in place to prevent contact with nip point. Replace belt if necessary. **Completion Date:** _____							
8. Opening between edge of rear table and cutter head of Jointer is not more than 1/8". Push blocks are used when jointing short or narrow stock. Automatic guard is covering all sections of the cutting head on the working side. Guard is effective in keeping fingers/hands from the revolving knives.							
CORRECTIVE ACTION: Ensure opening is not more than 1/8". Use push blocks for short or narrow stock. Ensure guards are in place and properly covering all sections, and is effective in preventing injuries. **Completion Date:** _____							
COMMENTS:							

Shop Inspection Checklist		Environmental Health & Safety Smith 103 774-7398
Location:	**Date:**	
Shop Supervisor:	**Inspector:**	
Department:		

				STATUS			
SHOP EQUIPMENT AND MATERIALS	**YES**	**NO**	**N/A**	**IN PROGRESS**	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
9. Brush(es) are available to remove stock shavings and chips. Compressed air is not used to clean person or clothing.							
CORRECTIVE ACTION: Provide brush(es) for removing stock shavings and chips. Prohibit use of compressed air for cleaning. **Completion Date:** _____							
10. The chuck key for a metal lathe shall be either of the following: Counterweighted to return it to storage position, or interlocked to prevent the chuck from being power driven when the key is in the chuck, or is spring loaded to eject it from the chuck.							
CORRECTIVE ACTION: Ensure that the metal lathe has a MIOSHA approved chuck key before further operation is allowed. **Completion Date:** _____							
11. Pieces of equipment or machinery are securely anchored to the floor or a bench.							
CORRECTIVE ACTION: Ensure equipment or machinery that can move from its operation due to vibration, or the vibration of nearby equipment or machinery is securely anchored. **Completion Date:** _____							
12. The blades of the shear are guarded. The hold down devices of the shear are guarded with an adjustable barrier guard.							
CORRECTIVE ACTION: Prohibit use of shear until all guarding is installed. **Completion Date:** _____							
13. Hand/foot controls should be enclosed or shrouded to prevent accidental recycling of the shear.							
CORRECTIVE ACTION: Enclose hand/foot controls to eliminate accidental recycling. **Completion Date:** _____							
COMMENTS:							

Shop Inspection Checklist		Environmental Health & Safety Smith 103 774-7398
Location:	**Date:**	
Shop Supervisor:	**Inspector:**	
Department:		

				STATUS			
SHOP EQUIPMENT AND MATERIALS	**YES**	**NO**	**N/A**	**IN PROGRESS**	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
14. Area behind the shear where sheared debris drops is barricaded or restricted.							
CORRECTIVE ACTION: Barricade or restrict the area behind the shear to prevent sheared debris from injuring a passerby. **Completion Date:** _____							
15. Chuck key is removed from the chuck of the drill press before operation. A jig, vice, clamps, or other fixture is used to secure stock to the bed.							
CORRECTIVE ACTION: Train employees to remove chuck key before operation to prevent injuries from a projected key. Ensure that stock is secured/stabilized, and not being held down by the operator's hand. **Completion Date:** _____							
16. Drill Press is securely anchored to the bench or floor. Pulleys and belts are guarded. Drill press table is free of tools and other materials.							
CORRECTIVE ACTION: Ensure that drill press is securely anchored, pulleys and belts are guarded, and drill press table is clear. **Completion Date:** _____							
17. Paint spray booth has up-to-date ventilation testing and demonstrates that the average air velocity over the open face of the booth is not less than 100 linear feet/min.							
CORRECTIVE ACTION: Contact EH&S, 774-3313 for assistance with testing or ventilation upgrades. Ensure that filters are changed regularly. **Completion Date:** _____							
18. There is at least 3 feet of clear space between storage and combustible construction. There is no open flame or spark producing equipment in the spraying area, nor within 20 feet thereof unless separated by a partition.							
CORRECTIVE ACTION: Separate storage, open flame or spark producing equipment according to the minimum stated distances from the spraying area. **Completion Date:** _____							
COMMENTS:							

Shop Inspection Checklist		Environmental Health & Safety Smith 103 774-7398
Location:	**Date:**	
Shop Supervisor:	**Inspector:**	
Department:		

WELDING	**YES**	**NO**	**N/A**	**STATUS**			
				IN PROGRESS	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
1. Welding area is isolated from other areas of the shop with signs posted designating welding areas. Welding power and ground cables are sized properly for the current required. Welding cable and electrode holder are in good condition (i.e. electrical connections are not frayed, cables and insulation are not damaged, cut, nicked, etc.).							
CORRECTIVE ACTION: Locate welding equipment, machines, cables, and other apparatus so that they do not present a hazard to personnel. Post signage. Have an electrician wire the equipment properly. Repair or replace damaged parts before further use. **Completion Date:** _____							
2. Welders are provided with appropriate personal protective equipment (i.e., eye protection, dry insulating gloves, flame resistant clothing or leathers, dry rubber mat for standing on while welding).							
CORRECTIVE ACTION: Ensure that welders are provided with and use the proper personal protective equipment. **Completion Date:** _____							
3. Welders are provided with a fire extinguisher within ten feet of their working area.							
CORRECTIVE ACTION: Ensure that there is an ABC fire extinguisher with a current inspection tag within ten feet of welding areas. **Completion Date:** _____							
4. All compressed gas cylinders are adequately secured with non-combustible restraints to keep the cylinder(s) from falling if bumped. All compressed gas cylinders are capped when not in use.							
CORRECTIVE ACTION: Contact EHS, 774-7398 for advice on how to properly secure cylinders. Train shop employees to cap compressed gas cylinders when not in use. **Completion Date:** _____							
COMMENTS:							

Shop Inspection Checklist		Environmental Health & Safety Smith 103 774-7398
Location:	**Date:**	
Shop Supervisor:	**Inspector:**	
Department:		

HAZARDOUS MATERIALS	**YES**	**NO**	**N/A**	**STATUS**			
				IN PROGRESS	**DISAGREE WILL NOT COMPLETE**	**SEEKING FUNDING**	**OTHER (EXPLAIN)**
1. Employees have been trained in Hazard Communication and are familiar with the contents of the Safety Data Sheets (SDS) for the chemicals in their shop and know where to locate them.							
CORRECTIVE ACTION: Contact EHS 774-3313 for assistance and training if necessary to ensure that all employees are trained on the chemicals and their use in the shop(s). **Completion Date:** _____							
2. All containers of chemicals are labeled with the contents and primary physical & health hazards.							
CORRECTIVE ACTION: Properly label all chemical containers, including stored and temporary containers. Contact EHS, 774-3313 for assistance, if necessary. **Completion Date:** _____							
3. Chemicals are stored according to compatibility (i.e., oxidizers separate from flammables).							
CORRECTIVE ACTION: Contact EHS 774-3313 for assistance with chemical storage and segregation. Completion Date: _____							
4. EHS has an updated chemical inventory (within last 12 months) for the shop(s).							
CORRECTIVE ACTION: Contact EHS, 774-3313 for assistance and forms. Date Completed: _____							
COMMENTS:							

Please review the report and take appropriate actions.

Place an X in the appropriate status column and return a signed copy of the report to Environmental Health & Safety: Caren Blanzy - Smith 103 by:

Signature: _____

Date: _____