NMSU Academic Shop Safety Policies and Practices

New Mexico State University's Academic Shop Safety Policies and Practices cover all aspects of physical plant and operations that contribute to safety, including supervision and monitoring, training pre-requisites, protective equipment, hours of operation, ingress and egress, tool guarding, warnings and advisories, facilities infrastructure, and safety inspections. The program is designed to ensure that NMSU academic shops meet industry-level safety practices, tailored for a university environment.

Promoting and maintaining a culture of safety depends on the individual behavior of everyone: students, staff, monitors, supervisors and faculty. We must look out for each other, teach each other, and when appropriate, caution each other. This policy was developed by as part of a larger, system-wide effort to promote a practical culture of safety at NMSU.

Guiding Principles

Shop and fabrication activities play an important role in the education and research activities in the arts, sciences and engineering. Safety is a shared responsibility that involves the institution, the user, and staff. Comprehensive safety emerges only when all aspects are considered: the tools, shop environment, individuals and the materials being used and fabricated. Collectively and individually, our focus is on establishing, supporting and maintaining a university-wide culture of safety. This program is oriented towards work performed in student shops but the principles apply as well to fabrication work that occurs outside of formal shops (e.g., construction of parade floats or building sets for dramatic productions).

Shop Safety Audits

The NMSU Environmental Health Safety and Risk Management (EHSRM) department conducts periodic detailed safety audits of each of the many shops on campus and follows up audits to ensure that any necessary remediation work is accomplished. A typical audit consists of a physical review of the shop infrastructure, required signage and postings, availability of safety supplies, engineering controls, personal protective equipment, shop housekeeping administrative controls and hazardous waste management. The safety training histories of staff and are also reviewed, as are the room and tool access policies. The audit also includes verification of tool condition and safeguarding. The reference document, ***NMSU Practices for Tool Guarding and Controls***, is used to assist in this evaluation. A written audit report is provided to the shop supervisor which includes any deficiencies or problems observed and suggestions for ways to correct the problems.

Shop and Tool Hazard Categories and Classifications

Appendix I presents a ***Tool / Shop Classification System Matrix*** designed on a scale of 1 to 4, with 4 being the highest hazard level or most specialized / complex level tools. The classification system also prescribes the tool use oversight, user training and supervisor training and experience requirements required for each hazard level.

The hazard category of a shop is defined to be the highest hazard category of any tool in the shop that is not disabled by a secure lock-out. Obviously, no hazards matrix can capture all the safety nuances of every possible situation, and common sense must be applied. Individual shop supervisors therefore are authorized to apply rules and make decisions that are *more* restrictive than those indicated in the tool classification matrix. The shop supervisor community is encouraged to communicate with each other and with EHSRM on the best practices, implementation strategies and difficulties encountered so that NMSU shop policies and rules can be updated as needed.

Key aspects of the tools and equipment classification matrix as they pertain to student access are summarized below:

All categories require users to obtain the permission of the shop supervisor or shop monitors before using any tools. As the categories increase the level of user training and tool use oversight increases. All categories of tools, except category 1 tools, require that users have some level training and demonstrate proficiency before using a tool. The tools a user is training and authorized to use is documented on their individual Shop Safety / Tool Use Agreement. Trained Shop Monitors can serve as supervisors and trainers for category 2 and 3 tools. Category 4 tools require a shop supervisor to be present and require users have the most extensive training.

Shop Monitors and Shop Supervisor must provide users the introductory Basic Shop / Tool Safety Orientation training which covers the basic shop rules (see ***Shop Rule Poster***) described in the ***Tool / Shop Classification System Matrix***. Shop supervisors and shop monitors, with the appropriate training and tool experience, also train, qualify and authorize users to use specific tools as outlined in the matrix using the ***Shop Safety Agreement / Tool Use Agreement***.

In general, nobody should be allowed to work alone in shops. Either a buddy system should be used or the activities overseen by either a trained Shop Monitor or Shop Supervisor. Both buddies and monitors / supervisors must have the appropriate shop training and the required qualifications for the tools being used and type of work being performed. All buddies and monitors / supervisors must be familiar with emergency notification protocols and equipment emergency shut-off procedures.

Definition, Roles and Authority of Monitors, Supervisors and EHS&RM

Shop Monitors

A *shop monitor* is an experienced student, postdoctoral associate, staff member or designated volunteer who has appropriate tool experience and has been certified by EHS&RM after completing the EHS&RM Shop Monitor / Supervisor training course. Monitors have full authority over shop operations and must be recommended to EHS&RM by shop supervisors. Monitors are expected to exercise their authority to halt unsafe operations at any time and to restrict shop access to anyone who violates the rules. Any problems should be reported to the Shop Supervisor, Department Head, EHS&RM and/or other administrative unit, as appropriate.

Shop Supervisors

A *shop supervisor* is a staff faculty member or approved designated volunteer who has documented professional-level experience and who has been certified by EHSRM after completing the EHSRM Shop Monitor / Supervisor training course. Professional staff members who are the primary shop supervisor have full authority over all shop operations and use, including use by faculty members. Supervisors are expected to exercise their authority to halt unsafe operations at any time and to restrict shop access to anyone who violates the rules.

Both shop monitors and supervisors must enforce the rules described in this plan, including the rules on shop hours, tool practices, worker pre-training / experience requirements, personal protective equipment requirements, tool and equipment guarding requirements, appropriate clothing, and rules about working alone in their shop. They should also model best practices and educate students to promote a general culture of safety in all shop and fabrication work. Any enforcement problems or problems with equipment needing repair, not working properly, or having broken or missing guards are to be reported to the appropriate administrative unit.

Designated Volunteers

Occasionally volunteers may be asked to serve in the role of a shop supervisor or shop monitor. The process for designating someone (including student volunteers) as an Affiliated Volunteer is described in the NMSU Administrative Rules and Procedure (ARP) 2.55, Part 3 Volunteer Affiliates.

NMSU Environmental Health Safety & Risk Management

EHS&RM has final authority over all safety issues and may halt operations or practices it considers unsafe any time at its discretion. EHS&RM performs periodic inspections in shops and works with shop supervisors, departments and colleges to resolve any safety issues identified.

Shop Access

All shops must have means for restricting access to tools. This can be accomplished many different ways depending on the shop configuration and type of tool. For example,

- Restricting room-level access using keys or an electronic access control system
- Lockable tool cabinets or tool boxes
- Electronic or mechanical locks on individual tools such as computer passcodes or keys.
- Locks on switches or power supplies

All users must sign a ***Shop Safety Agreement / Tool Use Agreement*** accepting the shop basic code of conduct. The agreement also defines the tools which the user has been authorized to use. This agreement must be completed and reviewed by the shop monitors or shop supervisor before access is granted to the shop and specific tools within the shop.

Project Safety Plans and Reviews

Student projects involving the use of tools in Category 2 and above should include a step where a formal safety plan is developed by the students prior to the start of the project. The review should identify potential hazards and the specific actions or controls used to mitigate each hazard. The plan should be reviewed by the shop supervisor, and where applicable, the faculty advisor. The development of a written safety plan, prior to beginning a project is an important educational opportunity for the student and should be treated as such. A Safety Plan template is available on the EHS&RM website.

Incident Reporting

The type of equipment and nature of activities typically performed in shops means there are frequently many hazards present. Incidents in shops range from high probability, low consequence events to low-probability events with potentially severe consequences. Shop monitors and supervisors are responsible for reporting all safety issues, incidents, and accidents that occur in their shop. The process for reporting an incident depends on the type of incident that occurred. Procedures for reporting incidents, of all types, can be found on the EHS&RM website at https://safety.nmsu.edu/campus-safety/loss-prevention-and-loss-ctrl/.

Any shop user who wishes to report unsafe conditions anonymously may do so using the NMSU EthicsPoint Hotline by calling:

1-866-ETHICSP (1-866-384-4277)

Continuous Improvement

The NMSU Academic Shop Safety Program is constantly evolving. Feedback, advice and suggestions from the user community is welcome and encouraged, Further, this document, its appendices and references do not represent the entirety of NMSU Shop Safety Program. For additional information and topics browse the EHS&RM website or call EHS&RM at 575-646-3327 to speak with a safety professional.

References

- ***NMSU Practices for Tool Guarding and Controls***
- ***NMSU Shop / Tool Use Safety Agreement***
- ***Shop Rules Poster***

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Appendix I

Shop Tool Classification Matrix

Classification Matrix for Student-Accessible Shops and Tools

Device Class	Class 1 General Hand Tools	Class 2 Small Powered Hand Tools	Class 3 Mounted and Free Standing Tools	Class 4 Large Industrial Tools and Specialized or High Risk Equipment
Tool Examples	• Screwdrivers • Pliers / Wire cutters • Wrenches • Sockets • Hammers • Hand Saws • Hand Files / Rasps • Awls / Punches/ Chisels • Hand Planes	• Drill guns / Drivers • Jig Saws / Sabre Saws • Circular Saws • Sanders / Grinders • Dremel-style Rotary Tools • Routers • Small Pneumatic Tools • Soldering irons and guns • Heat guns	• Table Saws • Drill Presses • Horizontal Band Saws • Bench Sanders / Grinders • Miter Saws • Sheet Metal Brakes • Sheet Metal Notchers • Sheet Metal Shears (manual) • Tubing Benders • Tubing Notchers • Planers / Jointers • Enclosed Laser Cutters • 3-D Printers • Fully enclosed Water Jet Cutters • Fully Enclosed CNC Machines	• Large Lathes • Milling Machines • Plasma Cutters • Welding Equipment • Large Vertical Band Saws • Radial Arm Saws • Open head CNC Machines • Iron Workers • Power Shears • Large Jointers / Planers • Open Water Jet Cutters
User Training / Use Requirements	• Basic Shop Safety Orientation by Shop Supervisor / Shop Monitor • Signed Shop / Tool Safety Agreement	• Basic Shop Safety Orientation by Shop Supervisor / Monitors • Signed Shop / Tool Safety Agreement • Individual Tool Instruction by Shop Monitor / Shop Supervisor • Demonstrate Proficiency • Tool Card showing list of tools approved for use.	• Basic Shop Safety Orientation by Shop Supervisor / Monitors • Signed Shop / Tool Safety Agreement • Individual Tool Instruction by Shop Monitor / Shop Supervisor • Demonstrate Proficiency • Tool Card showing list of tools approved for use.	• Basic Shop Safety Orientation by Shop Supervisor / Monitors • Extensive Individual Tool Instruction by Shop Supervisor • Demonstrate Proficiency • Tool Card showing list of tools approved for use. • Signed Shop / Tool Safety Agreement

Classification Matrix for Student-Accessible Shops and Tools continued

Device Class	Class 1 General Hand Tools	Class 2 Small Powered Hand Tools	Class 3 Mounted and Free Standing Tools	Class 4 Large Industrial Tools and Specialized or High Risk Equipment
Tool Use Oversight Requirements	• Permission of Shop Supervisor or Monitor	• Permission of Shop Supervisor or Monitor • Shop Supervisor or Shop Monitor will verify tool proficiency prior to allowing unmonitored use.	• Shop monitor or Shop Supervisor supervision required	• Shop Supervisor supervision required.
Shop Monitor / Supervisor Training & Experience	• Completion of EHS&RM Shop Safety Training Class for Shop Monitors & Shop Supervisors	• Shop supervisor / shop monitors must have specific tool experience to instruct and approve others and sign Tool Authorization forms. • Completion of EHS&RM Shop Safety Training Class for Shop Monitors & Shop Supervisors	• Shop supervisor / shop monitors must have specific tool experience to instruct and approve others and sign Tool Authorization forms. • Completion of EHS&RM Shop Safety Training Class for Shop Monitors & Shop Supervisors	• Shop supervisors must have documented professional-level experience using the tool and sign Tool Authorization forms. • Completion of EHS&RM Shop Safety Training Class for Shop Monitors & Shop Supervisors

1. Shop Monitors are experienced students or staff with full authority over shop use and control who have been recommended by the Shop Supervisor and completed required safety training.
2. Shop Supervisors are staff or faculty with professional-level training and experience in applicable tool set-up, use, and maintenance