

User Shop Orientation

August 17, 2005

This orientation is intended for experienced machine-tool operators. By itself, this orientation will not provide the knowledge and experience required to use machine tools properly.

By reading, signing, and returning the attached signature page to the Shop Coordinator, you will have completed the User Shop Orientation. You will need additional machine-specific certification to become authorized to use the various machine tools in the User Shop.

No one is allowed to use a User Shop until they have been authorized to do so according to the requirements of this policy.

DEFINITIONS

- **User Shop:** Any location where machine tools are available to CAT/XSD personnel, including the shared, central pentagon LOM shops and CAT/XSD managed areas.
- **Shop User:** Any person who uses machine tools in a user shop.
- **Machine Tools:** Stationary, as opposed to hand-held, material forming tools.
- **Shop Coordinator:** Appointed by CAT/XSD management to represent/oversee its interest in user shop operations
- **Machine Shop Certifier:** An independent party appointed by the APS, to determine, via hands-on demonstration and/or written tests, if a shop user candidate has sufficient ability to use the machines in a proper, safe manner.

RESPONSIBILITIES

- Shop Users shall obtain the required authorization before they are permitted to use portable power tools or machine tools in a User Shop. Shop User shall report to their Shop Coordinator any unsafe usage of hand tools, portable power tools, or machine tools as soon as it comes to their attention.
- Hand tools and portable power tools shall be inspected before each use to check that the condition of the tool is safe for use. Defective tools must not be used. A Shop User shall inspect machine tools before each use of the tool to verify that the tool has the required guarding and is operating properly. Machine tools having deficiencies will be locked out by the Shop Coordinator or by an APS Floor Coordinator and will not be returned to service until the problems have been corrected.
- Injuries incurred from machine tools are most often caused by unsafe work practices or improper procedures. Poor training and inadequate supervision are often contributing causes. Using proper safeguarding on machines, good housekeeping in the work area, and good work habits help to reduce injuries and accidents.

AUTHORIZATION OF PERSONNEL

Only authorized Shop Users are allowed access to the User Shop for use of the machine tools located within the Shop.

List of Authorized Operators

The Shop Coordinator maintains a User Shop Access List of the names of personnel who have received the general orientation to the User Shop and of the machine tools in the shop that each person has been authorized to use. *A copy of this list is posted on the outside of the door to the User Shop and on the bulletin board inside the shop. For shops with APS supplied card readers, badge numbers are added by the User Office to the electronic lock database.*

Earning Authorization

It is not possible to provide in-depth training for every person who might want to use a User Shop. Consequently, most persons wishing to use these shops should already have the appropriate skills before coming to the CAT/XSD facilities. Individuals who lack the appropriate shop skills will need to have their machining done for them by others. The Shop Coordinator will provide experienced machine tool operators with a User Shop Orientation and with a copy of the User Shop Rules. Completion of the shop orientation enables access to the shop for the use of clamping devices and hand tools only.

To earn authorization to use specific machine tools in the User Shop, you must complete this orientation, and you must pass machine-specific examination(s) to demonstrate that you can use the specified machine tools properly and safely. These examinations are administered by the Machine Shop Certifier (or designee) and can be arranged through the Floor Coordinator. Obviously, some of the machine tools (e.g., lathe, milling machine) in the LOM Shop will require the operator to have more experience and greater in-depth knowledge than will others (e.g., pedestal grinder, sander). The judgment regarding whether or not you possess the experience to operate a particular machine tool properly will be made by the Shop Coordinator (or designee), who will then refer you to the Machine Shop Certifier (or designee) for machine-specific examination(s).

After you have completed the User Shop Orientation and have demonstrated to the Machine Shop Certifier (or designee) that you can use specified machine tools properly, the Shop Coordinator will add your name to the User Shop Access List in the User Shop, and you will be considered to be an authorized operator of the specified machine tools. Your APS User badge will allow you access to the LOM Shop.

The Shop Coordinator (or designee) for each of the CATs/XSD assigned to the LOM Shop is responsible for authorizing members of his/her CAT/XSD to use specified machine tools in the User Shop, following the procedure described above.

Loss of Authorization

Any APS Floor Coordinator or any CAT/XSD Director, CAT on-site manager, Safety Officer, or Shop Coordinator of the sectors assigned to the User Shop may suspend or revoke for cause a person's authorization to use that User Shop or the machine tools located therein. Defeating or circumventing installed guarding is, by itself, sufficient cause for revocation of a person's authorization to use a User Shop. Other causes for revocation include, but are not limited to, repeatedly failing to use appropriate personal protective equipment, repeatedly using unsafe shop practices, continuing to use tools improperly after being shown the proper usage, repeatedly failing to clean up work area before leaving the shop, and repeatedly failing to use proper machine-shop etiquette. Allowing an unauthorized person access to the machine tools in the User Shop is also a cause for revocation of privileges.

If a person's authorization to use the User Shop is revoked, that person's name will be removed from all User Shop Access Lists. Persons who continue to use a User Shop after losing their Authorization may lose their site access privileges to the APS.

USER SHOP RULES

The User Shop Rules are posted on the wall in the User Shop. You must adhere to these rules to maintain your authorization.

The safety standards set in the following should be also be observed:

- The safe use of tools is discussed in Chapter 7-12 in the ANL-E ES&H Manual,
- OSHA regulations that pertain to the safe use of hand tools, portable power tools, and other hand-held equipment can be found in 29 CFR 1910, Subpart P, and
- the safe use of machine tools/machine guarding is discussed in Chapter 7-15 in the ANL-E ES&H Manual.

Appendix A contains a copy of the LOM shop rules.

HOUSEKEEPING

As an authorized Shop User, you are responsible for maintaining your work area in a safe and reasonable condition. Plan and conduct your work in a manner that does not create tripping hazards, and complete the cleanup of your work area before you leave the shop.

DEMARCATED AREAS

Keep demarcated aisles free of equipment and materials. Maintain routes of egress clear at all times.

MACHINE GUARDING

Only specifically authorized personnel (e.g., machine-maintenance personnel, APS Floor Coordinators, and Shop Coordinators) may remove machine guards. The casual operator of the machine tool is not authorized to remove machine guards. *Machine guards shall not be removed unless necessary for repair, adjustment, oiling, or other maintenance, and must be replaced before the unit is put back in service.*

Before each use of a machine tool, the authorized Shop User will ensure that the machine guarding is in place. If a machine guard interferes with your work, report the problem to your Shop Coordinator or to an APS Floor Coordinator. *The use of machine guards does not mitigate the requirement for proper eye protection.*

MACHINE MAINTENANCE

All maintenance of APS-provided machine tools (i.e. pedestal grinder, sander, drill press, and lathe) in a LOM Shop must be arranged through the APS Floor Coordinator.

LOCKOUT/TAGOUT

Lockout/tagout procedures must be coordinated through an APS Floor Coordinator. Notify your Shop Coordinator if you feel you need to engage in User Shop activities that require lockout and tagout. Be sure to notify your Shop Coordinator immediately after any equipment that has been locked out.

WASTE

Dispose of wastes such as metal chips, oily rags, and other dirty rags in the containers provided. Use brushes to brush off chips and shavings from machines; do not use your bare hands or an air hose.

EMERGENCY POWER CUTOFF

You must know the location of the emergency power cutoff prior to operating any power equipment, and you must have ready access to this switch during operation of the equipment. *Learning about the locations of the emergency power cutoff will be included in the operator-authorization process for each machine tool in the User Shop.*

SPILL CONTROL

Shields or splash guards will be used on machines where cutting oils or coolants are used. To minimize the danger of slipping, floors around machinery should be kept dry and clear of refuse. In the event of leakage or a spill, use a spill-control absorbent immediately to control the leakage or spill, and then be sure to clean it up. You should also notify your Shop Coordinator or an APS Floor Coordinator in a timely fashion about the leakage or the spill – especially if you have been unsuccessful in conducting a thorough clean-up.

MACHINE CONTROLS

You must be aware of the various machine controls (start button, stop button, speed-change control) for each machine you are authorized to operate. These controls must be accessible and unobstructed at all times during operation of the equipment. *Learning about the locations and functions of the various machine controls will be included in the operator-authorization process for each machine tool in the User Shop.*

USING HAND TOOLS AND PORTABLE POWER TOOLS SAFELY

The misuse and improper maintenance of hand tools and portable power tools cause injuries to even "experienced" workers. Consequently, the following policies and procedures have been adopted to minimize the hazards associated with the use of such equipment at the APS. These guidelines apply to all use of hand tools and portable power tools by Shop Users while performing maintenance or installation activities at the APS.

Hand-Tool and Portable-Power-Tool Safety Training

If you have not had formal training in the use of common hand tools and portable power tools, attend ANL ESH Course #141 Portable Hand- & Power-Tool Safety.

Requirements for Portable Cord-Connected Electrically Powered Tools

All portable cord-connected electrically powered tools must be either double-insulated or grounded through a polarized grounding plug (3-wire, in most cases) **and** must be listed by Underwriters' Laboratories or another recognized listing agency. These electrically powered tools -- even if double insulated -- should be powered through GFCI-protected receptacles. However, **all cord-connected electrically powered hand-held tools must be powered through GFCI-protected receptacles** (see Chapter 9-2 in the ANL-E ES&H Manual).

- The ANL-E ES&H Manual requires only cord-connected electrically powered *hand-held* tools to be powered through GFCI-protected receptacles, but it is prudent to power all portable cord-connected electrically powered tools through GFCI-protected receptacles.
- *Portable* cord-connected electrically powered tools used in the vicinity of sinks and wet environments must comply with the grounding requirements of Title 29 CFR Part 1910, Subpart S. In addition, ***all portable cord-connected electrically powered tools used in the vicinity of sinks and wet locations must be powered through GFCI-protected receptacles*** (see Chapter 9-2 in the ANL-E ES&H Manual).

General Guidelines for the Safe Use of Hand Tools and Portable Power Tools

- Be sure to read, understand, and follow the instructions the manufacturer has provided for each tool you use.
- Use proper personal protective equipment.
- When tools are not in use, they should be stored in appropriate storage facilities.
- Electrically powered tools should be disconnected from the source of power before accessories are changed.

Routine Inspections of Portable Cord-Connected Electrically Powered Tools

All portable cord-connected electrically powered tools belonging to the CAT/XSD will be inspected upon receipt and at least annually thereafter. The ANL-E ES&H Manual requires annual inspections only for cord-connected electrically powered hand-held tools, but it is prudent to include all portable cord-connected electrically powered tools in this inspection program. If a portable electrically powered tool is found to be defective, it will be removed from service immediately to be repaired or discarded. If a portable cord-connected electrically powered tool passes the inspection tests (including proper operation), it will be labeled with the inspection date and the name of the inspector. Unless they are included in the ANL/APS portable power-tool inspection program mentioned above, all portable cord-connected electrically powered tools which belong to and are brought to the CAT/XSD facilities by a CAT/XSD member, collaborator, or General User – even if for only the duration of an experiment – must be appropriately inspected and labeled by the Shop Coordinator prior to their use at the CAT/XSD facilities. The following routine inspections shall also be conducted:

- Before each use, electrically powered portable tools and ancillary equipment such as cords, plugs, and GFCIs shall each be inspected for signs of chafing, cracking, wear, or other forms of faulty insulation; for evidence of faulty grounding conductors; for cracked plugs or receptacle housings; for bent or missing plug or connector pins; for presence of dead-front plugs, receptacles, or connectors; for missing, bent, or otherwise abused switches; for improperly functioning trigger locks (i.e., dead-man switches); and for the date of the tool's last inspection, where applicable.
- Any portable power tool that has an out-of-date inspection label (or no inspection label at all) should be inspected and tested by qualified personnel before it is used. *Consult your Shop Coordinator.*
- Signs of a defect shall require the retirement of the power tool/equipment from service and the return of the power tool/equipment to your Shop Coordinator for repair.
- While in use, power tools and ancillary equipment should be observed for improper operation, including any signs of overheating or excessive sparking. Indications of improper operation should be reported to your Shop Coordinator.

Controlled Materials

When planning on machining lead, please refer to the APS lead machining procedure.

Other toxic materials which will be reviewed on a case-by-case basis include:

Arsenic, Cadmium, Ceramic Fibers, Chromates, Manganese, Selenium, Silica, crystalline (quartz, cristobalite, tridymite), Tellurium, Vanadium, other materials of similar toxicity, organic solvents unless approved by the AES ESH Coordinator.

If the CAT/XSD authorized personnel need to machine the above toxic items they must submit a plan for safety review to the Shop Coordinator. The Shop Coordinator and the Floor Coordinator will arrange for a safety review meeting to approve the operation. Machining Beryllium and Asbestos is prohibited.

REFERENCES

- 29CFR1910
- Chapter 7-12, Safe use of Tools, the *ANL-E ES&H Manual*
- Chapter 7-15, General Requirements for All Machines, the *ANL-E ES&H Manual*
- Chapter 9-2, Ground Fault Circuit Interrupters, the *ANL-E ES&H*
- Chapter 13.2, Compressed Gas Cylinders, the *ANL-E ES&H*

APPENDIX A

USER SHOP RULES

- Shop door must be propped open when working in the shop.
- Notify the Floor Coordinator before starting work in the shop after hours or during weekends/holidays.
- Machine tools and power tools shall be operated only by personnel trained and authorized to operate that equipment.
- Do not engage in horseplay.
- Plan each job well in advance and ensure that the proper tools are available; choose appropriate tools that will provide the best efficiency and maximum safety for the task at hand.
- Use the correct tool for the job. If the correct tool is not available or in proper working condition, inform your Shop Coordinator
- Tools must be kept in good working condition. Immediately report to your Shop Coordinator or to an APS Floor Coordinator all malfunctions and deficiencies in the User Shop.
- Proper Attire
 - Wear ANSI-approved safety eyewear with side shields whenever in the machine shop. Use appropriate head and face protection as required by working conditions.
 - Do not wear jewelry or loose fitting clothing while operating machines. Remove neckties, tuck in shirt tails, and roll up and secure shirt sleeves.
 - Sturdy leather shoes (safety shoes preferred) are required. Athletic shoes, sandals, etc., do not satisfy this requirement.
 - Restrain, (i.e., cover or tie back) long hair that could get caught in moving parts.
- Use only brushes, vacuum tools, or other special tools to clean debris from work pieces and machines. Do not use your bare hands to brush away chips and **DO NOT USE COMPRESSED AIR TO BLOW CHIPS AND DUST FROM WORK WHERE A BRUSH CAN BE USED FOR THIS TASK.**
- Compressed air shall not be used for cleaning clothing. The air jet tends to drive particles into the fabric where they can cause skin irritation.
- Do not tamper with or modify the "blow guns" that are commonly used in shop areas to dispense compressed air. The design of these blow guns is such that, for a specific inlet pressure, the outlet pressure is less than 30 psig so the stream of gas will not penetrate the skin.
- Use tongs or other remote-handling tools to keep hands away from pinch points and moving parts.
- As appropriate, use vises and clamps to hold work pieces.
- Do not manually adjust work pieces or use calipers to measure work pieces while the machine is running.

- Do not use the grinding wheels on the pedestal grinder in the LOM Machine Shop to grind non-ferrous materials (e.g., aluminum, brass, plastics, or wood).
- Contact the Shop Coordinator or an APS Floor Coordinator if you need to have a grinding wheel installed, dressed, or replaced.
- Proper machine guards must be in place on machine tools such as drill presses, lathes, grinders, sanders, and saws while these tools are being used. Do not remove or circumvent any machine guarding.
- Inspect tools before use.
 - Cutting tools must be kept sharp in order to operate efficiently and safely.
 - Before use, check the security of the head attachment on a hammer. Check that the handle is not loose or broken.
 - Do not use a chisel or other tool which has a mushroomed or spalled head.
 - All files shall be provided and used with proper handles.
- Tools must be used properly. Use hand tools for their intended use.
 - Do not hammer with a wrench.
 - Do not use screwdrivers or files for prying.
 - If a wrench is required, select a wrench of the proper size and type for the task at hand. If it is necessary to hit a wrench with a hammer or mallet, use a wrench designed for that purpose (i.e., a "striking wrench").
- If it is necessary to leave heated work unattended, "Hot Hazard" signs should be posted, and a barrier should be erected around the hot materials to protect passersby from accidental contact with the hot materials.
- Do not leave machines running unattended.
- Do not leave the work area without completing cleanup.
- Tools should be kept in a safe place. Tools should not be placed where they may cut or fall on someone, into a machine or where they may cause a tripping hazard. Sharp-edged or pointed tools should be sheathed or stored safely in tool boxes.