

6 August 2009

Safety

Arts-and-Crafts Facility Safety

For the Director:

JOANN CHAMBERS
Chief of Staff

Official:



DWAYNE J. VIERGUTZ
Chief, Army in Europe
Document Management

Summary. This regulation—

- Prescribes policy for ensuring the safe operation of Army in Europe arts-and-crafts facilities.
- Provides guidelines for supervising and training users of arts-and-crafts facilities.
- Describes how to design arts-and-crafts facilities.
- Explains how to operate and safeguard powered equipment used in arts-and-crafts facilities.

Applicability. This regulation applies to U.S. Forces personnel in the Army in Europe and their Family members.

Supplementation. Organizations will not supplement this regulation without IMCOM-Europe (IMEU-SO) approval.

Forms. AE and higher level forms are available through the Army in Europe Publishing System (AEPUBS).

Records Management. Records created as a result of processes prescribed by this regulation must be identified, maintained, and disposed of according to AR 25-400-2. Record titles and descriptions are available on the Army Records Information Management System website at <https://www.arims.army.mil>.

Suggested Improvements. The proponent of this regulation is the Safety Office, IMCOM-Europe, (IMEU-SO, DSN 370-6284). Users may suggest improvements to this regulation by sending DA Form 2028 to IMCOM-Europe (IMEU-SO), Unit 29353, Box 200, APO AE 09014-9353.

Distribution. C (AEPUBS).

CONTENTS

SECTION I INTRODUCTION

1. Purpose
2. References
3. Explanation of Abbreviations
4. Responsibilities

SECTION II SAFETY GUIDELINES

5. Restrictions
6. Fire Protection
7. Personal Protective Equipment
8. First-Aid Equipment
9. Accident and Mishap Reporting

SECTION III ARTS-AND-CRAFTS FACILITIES

10. Design and Layout
11. Lighting
12. Ventilation
13. Storage
14. Housekeeping

SECTION IV POWERED EQUIPMENT

15. Equipment Guards and Safety Devices
16. Marking Powered Equipment
17. Operating Powered Equipment
18. Portable Power Tools
19. Electrical Precautions
20. Cleaning Powered Equipment

SECTION V AUTO-SKILLS FACILITIES

21. General
22. Lifting Devices
23. Welding

SECTION VI STRIP YARDS

- 24. General
- 25. Facility Inspection and Certification

SECTION VII SPECIALIZED AREAS AND SHOPS

- 26. Kiln Areas
- 27. Carpentry and Framing
- 28. Photography Shops
- 29. Jewelry-Making

Appendixes

- A. References
- B. Specific Instructions and Requirements for Powered Equipment
- C. Sample Hazard Analysis Worksheet for Industrial Equipment - Table Saw
- D. Sample German Instructions for Milling Machines

Table

- 1. Welding Operations

Glossary

SECTION I INTRODUCTION

1. PURPOSE

This regulation prescribes policy and procedures for maintaining safety in arts-and-crafts facilities, which includes auto-skills facilities and auto strip-yard facilities.

2. REFERENCES

Appendix A lists references.

3. EXPLANATION OF ABBREVIATIONS

The glossary defines abbreviations.

4. RESPONSIBILITIES

- a. United States Army garrison (USAG) commanders will—

- (1) Provide physical locations for arts-and-crafts facilities that are free from hazards likely to cause serious physical harm or death to employees and users.

- (2) Establish local policy for managing arts-and-crafts facilities.

b. USAG directorates of public works (DPWs) will maintain arts-and-crafts facilities. This will include, but not be limited to, the following:

(1) Ensuring that building structures are in good repair.

(2) Ensuring that enough electrical outlets and power are provided to support operational equipment in facilities. DPWs will ensure that electrical outlets are in good repair and will test the resistance of grounding circuits before they are first used after being installed or repaired. DPWs will label all circuit-breaker panels throughout facilities and all wall outlets to show voltage.

(3) Ensuring facilities meet the ventilation requirements specified in paragraph 12.

(4) Approving and providing additions, changes, or other alterations to installed electrical wiring, fixtures, and equipment.

(5) Ensuring all appropriated-fund (APF) and nonappropriated-fund (NAF) equipment is inspected twice a year and all stationary devices are inspected once a year. DPWs will document test results and keep them on file for inspection or attach a label to equipment to show when the next inspection is required.

(6) Installing plumbed emergency eyewash and shower equipment in accordance with the American National Standards Institute (ANSI) Z358.1-2004 and comparable host nation/European Union (HN/EU) standards, as required by hazard analyses.

(7) Ensuring that arts-and-crafts facilities are provided with adequate numbers and types of fire extinguishers in accordance with National Fire Protection Association (NFPA) standards and as determined by the USAG fire department.

c. USAG safety managers will determine and document the required frequency of safety inspections based on hazard evaluations performed for each operation in each facility.

d. Local United States Army Center for Health Promotion and Preventive Medicine - Europe industrial hygienists (IHs) will perform an industrial hygiene survey (IHS) at least once a year. Additional IHSs may be required when adding new operations or equipment, or based on hazard evaluations performed for each operation in each facility.

e. USAG Family and morale, welfare, and recreation (FMWR) directors will—

(1) Ensure standing operating procedures (SOPs) for arts-and-crafts facilities in their area of responsibility exist and are used. These SOPs must be available in each arts-and-crafts facility and will include, but not be limited to, the following:

(a) Establishing shop policy and safety procedures.

(b) Ensuring that a safety-reference library is made available and maintained.

(c) Ensuring that users are issued a “qualification pass” to use arts-and-crafts facility power equipment from the pass module in FMWR’s RecTrac.

1. A pass will be created in the RecTrac pass module called “A&C Qualification Pass.”

2. A comment stating which equipment the customer is authorized to use will be printed on a “qualification receipt” and given to the customer.

3. The customer will register for the pass, and the receipt will serve as proof of qualification for reciprocating services from other arts-and-crafts facilities in the theater.

4. Managers will use the pass-module reporting features to track user qualifications, reprint qualification receipts, and provide reports to higher level managers.

(2) Appoint a building fire manager and evacuation coordinator for each arts-and-crafts facility (generally referred to as “building manager”). The shop supervisor may be the building manager. The building manager or appointee (delegated in writing by the building manager) will—

(a) Be trained by the fire and emergency services (F&ES) fire-prevention division.

(b) Execute fire-prevention measures in the assigned building or facility.

(c) Provide written reports to the fire chief, including self-inspections, emergency-evacuation plans, fire-safety briefings, and occupant training.

(3) Ensure that arts-and-crafts directors and shop supervisors implement all requirements in this regulation.

f. USAG arts-and-crafts directors will—

(1) Implement and monitor arts-and-crafts safety and training programs.

(2) Ensure shop supervisors implement all requirements in this regulation.

g. USAG arts-and-crafts shop supervisors will—

(1) Ensure that arts-and-crafts facilities are operated in a safe manner by making sure that all shop policy and procedures address specific safety procedures. These safety procedures include, but are not limited to, the following:

(a) Recognizing safety hazards.

(b) Using engineering controls (for example, machine guards, ventilation).

(c) Substituting more hazardous products with less hazardous ones if possible.

(d) Training on specific pieces of equipment.

(e) Using personal protective equipment (PPE).

(f) Following administrative (labeling) requirements.

(2) Develop an SOP as described in e(1) above for their arts-and-crafts facilities.

(3) Make available and maintain a reference library of safety regulations in each arts-and-crafts facility. The safety-reference library will include a printed copy or electronic access to this regulation, AR 385-10, AE Regulation 385-40, IHSs and inspection reports, local fire and safety directives, and policy letters (command and local) concerning safety. The safety-reference library should also include copies of all safety- and fire-inspection reports.

(4) Develop an instructional program that includes shop safety policy and procedures established in the SOP (e(1) above) for users of arts-and-crafts facilities. Instructional programs should also include the following:

(a) The location of hazard analysis worksheets and operating or instruction manuals for each piece of powered equipment (for example, electrical, pneumatic).

(b) A demonstration of how to properly and safely use powered equipment (for example, electrical, pneumatic) (sec IV and app B) before issuing appropriate equipment-qualification receipts to users.

(c) A brief description of materials used for particular crafts and any associated material safety datasheets (MSDSs).

(d) Identification of any required PPE. This will include—

1. When PPE is necessary.

2. Which type of PPE is necessary.

3. The limitations of PPE.

4. A demonstration on how to properly put on, take off, adjust, and wear PPE.

5. The proper care, maintenance, useful life, and disposal of PPE.

(5) Include hazard analysis worksheets for all equipment and power tools (for example, electrical, pneumatic). See appendixes C and D for examples in English and German, respectively.

(6) Perform job hazard analyses (JHAs) for all their employees.

(7) Monitor user activities, workareas, and the use of all equipment.

(8) Inspect the building and fire extinguishers once a month (para 6b(1)) if appointed as building fire manager.

(9) Set up a regular schedule for inspecting and maintaining all equipment (for example, cleaning, oiling, sharpening, tightening, replacing fuses) and discard defective equipment immediately.

(10) Implement a formal hazard-communication program in accordance with the Occupational Safety and Health Administration (OSHA) and Section 1200, Part 1910, Title 29, Code of Federal Regulations (29 CFR 1910.1200). The program will include, but not be limited to, the following:

(a) Preparing a written hazard-communication plan that addresses responsibilities during emergency situations.

(b) Identifying and evaluating chemical hazards in the workplace and updating the inventory of all hazardous materials used and stored.

(c) Developing procedures for spills, leaks, and accidents.

(d) Training for all employees who will potentially be exposed to hazardous chemicals.

(e) Ensuring that at least one first-aid trained employee is available during workhours.

(f) Developing an MSDS file that corresponds to the inventory list and all chemicals.

(g) Ensuring incoming products are properly labeled and, when necessary, developing a system in the facility for labeling. This system must address disposable containers and containers for temporary use.

(h) Requiring program evaluation, improvements, and updates.

h. USAG arts-and-crafts shop employees will—

(1) Comply with and ensure that users comply with shop policy and safety procedures in g(1) above.

(2) Comply with and ensure that users comply with the shop SOP described in e(1) above.

(3) Comply with JHAs conducted by shop supervisors (g(6) above).

(4) Wear and ensure that users wear required PPE.

(5) Adhere to schedules for maintaining equipment that are set up by shop supervisors (g(9) above).

(6) Comply with and ensure that users comply with fire regulations.

(7) Obtain and ensure that users obtain equipment-qualification receipts (e(1)(c) above) and ensure that users do not use any equipment that has not been approved on their qualification receipts (if required).

i. Users of arts-and-crafts facilities will follow shop employees' instructions and will—

(1) Comply with the shop SOP and fire regulations.

(2) Learn and practice safety procedures that apply to their crafts.

(3) Obtain equipment-qualification receipts as described in e(1)(c) above. Users will not use any equipment that has not been approved on their qualification receipts.

(4) Wear required PPE.

SECTION II SAFETY GUIDELINES

5. RESTRICTIONS

a. Prohibited items in arts-and-crafts facilities include the following:

(1) Weapons, explosives, and ammunition parts or devices, live or fired.

(2) All foods and beverages in workareas, including auto-skills facilities.

(3) Loose clothing, jewelry, or hair that may be caught in equipment or tools.

(4) MP3 players, iPods, or other devices with headsets. These devices will not be used in craft shops where any pneumatic or electrical powered equipment is used, because persons wearing headsets may not be able to hear warnings from others.

b. Rough or reckless behavior is prohibited in arts-and-crafts facilities.

c. Shop supervisors may deny facility access and may cancel equipment-qualification receipts for users who do any of the following:

(1) Disregard safe-operating procedures.

(2) Operate any equipment or power tools without permission or proper qualification receipts.

(3) Are under the influence of alcohol or drugs.

(4) Create a risk to other users or employees of the facility.

6. FIRE PROTECTION

a. The USAG fire department will—

(1) Identify operations requiring fire inspections, determine the required frequency, and provide fire inspections for these operations.

(2) Provide training and an SOP with checklists for building managers for each arts-and-crafts facility.

(3) Delineate areas in facilities where welding and other operations posing fire risks may occur, and issue “hot-work permits” for these areas, as required.

(4) Identify primary and secondary exit routes to the building manager and determine the location and number of required evacuation routes.

b. The building manager will—

(1) Inspect the building and fire extinguishers once a month. Building managers must complete the appropriate inspection checklists from the SOP provided by fire inspectors during training (a(2) above). They will maintain completed checklists in a “fire file.” This file will also include the SOP and fire-safety training certificate.

(2) Develop, in coordination with the USAG fire department, emergency plans for evacuating the building, reporting and controlling fires, and salvaging property. Building managers will submit these plans to the USAG fire department for approval. Emergency plans must identify primary and secondary evacuation routes (provided by the fire inspector) at each exit for each room and area of the shop. Building managers will ensure all exit signs are posted.

(3) Conduct evacuation drills in coordination with the USAG fire department, and according to AR 420-1, paragraph 3-47.

(4) Obtain a hot-work permit from the USAG fire department for all areas where welding, cutting, or open sparks may occur. The permit will document that fire-prevention and protection requirements in 29 CFR 1910.252(a) have been implemented before beginning the hot-work operations. The permit will also list the dates authorized for hot work and identify the objects or types of objects on which hot work is to be performed, and the required safety precautions. The permit must be kept on file, and copies must be posted in authorized locations.

(5) Ensure operations meet all other requirements of the local USAG fire-protection and fire-prevention SOP.

(6) Coordinate with DPW and the fire department for authorization to temporarily use or discontinue using space heaters and other electronic devices.

(7) Dispose of oily and paint-soaked items in clearly marked, covered metal containers approved by the USAG fire department.

c. Arts-and-crafts shop supervisors and employees will inspect assigned areas daily during normal operation and at the close of business to—

(1) Detect and eliminate fire hazards.

(2) Ensure electrical appliances and equipment are turned off or disconnected when not in use. This excludes appliances that are required to run continuously, such as clocks, refrigerators, and water coolers.

(3) Ensure trash is disposed of daily at the close of business.

d. Smoking is strictly prohibited in all U.S. facilities and areas immediately outside them.

e. Highly flammable liquids will not be used for cleaning purposes in arts-and-crafts facilities.

7. PERSONAL PROTECTIVE EQUIPMENT

a. Shop supervisors will—

(1) Require appropriate PPE be used with equipment as prescribed by 29 CFR 1910.132.

(2) Provide training to each person (employee and user) required to use PPE, as described in paragraph 4g(4)(d). Shop supervisors must verify that each person has received and understood the required training. The shop supervisor will provide written certification that has the name of each trainee, dates of certification, and the subject of the certification.

(3) Ensure that defective or damaged PPE is not used.

(4) Ensure that PPE is stored in a sanitary condition (for example, in plastic bags, in other containers) to reduce the potential for contamination or degradation of materials.

(5) Ensure that their facilities provide appropriate hearing-protection devices where powered equipment (for example, electrical, pneumatic) creates hazardous noise. Appropriate hearing protection may consist of hand-formed foam earplugs that do not require a medical fitting (referred to as earplugs) or circumaural muffs (referred to as muffs). To support hearing protection, shop supervisors will—

(a) Request an IHS as described in paragraph 4d to identify areas where hearing protection is required. For more information on hearing conservation, refer to DA Pamphlet 40-501.

(b) Designate areas where hearing protection is required on entry (for example, woodworking areas) by posting appropriate signs and posters.

(c) Designate specific equipment that requires the use of hearing protection. Equipment must be designated by placing OSHA or HN/EU signs nearby or by marking the equipment itself.

(d) Give users the opportunity to select from at least two types of appropriate hearing-protection devices provided by the facility.

(e) Prohibit the use of foam earplugs in areas (such as auto-skills facilities) where grease or hazardous materials can be transferred to the ears through the earplugs. Shop supervisors may provide only muffs in these areas.

(6) Ensure that their facilities provide appropriate eye protection in accordance with OSHA and host nation (HN) standards, based on the specific hazards users will encounter.

(7) Ensure that their facilities provide appropriate hand and body protection.

(8) Manage respiratory protection for each facility by ensuring that—

(a) No employee is issued a respirator unless determined necessary by an IHS.

(b) All users who bring their own respirators are allowed to use them.

b. Shop employees will—

(1) Comply with shop supervisor PPE requirements.

(2) Ensure that users receive instruction and written certification (a(2) above) on properly using PPE required for their activities and ensure that they wear required protective equipment and clothing.

(3) Wear PPE and ensure that users wear PPE, as required.

c. Shop users will receive instruction and written certification from shop supervisors on how to properly use PPE required for their activities and will wear required protective equipment and clothing.

8. FIRST-AID EQUIPMENT

a. In accordance with ANSI Z308.1-2003 and comparable HN/EU standards, arts-and-crafts facility supervisors will provide first-aid kits for emergency use in each arts-and-crafts facility.

b. First-aid kits must be easily accessible and marked. For example, when crafts and photography shops are next to one another in the same building, one first-aid kit will be sufficient for both facilities. One first-aid kit should have seals intact to ensure a complete kit is available in case of an accident. Where local national (LN) employees are present, one first-aid kit compliant with HN requirements must be readily accessible to LNs with instructions in the HN language.

c. Shop supervisors will assess the specific needs of their worksites and augment their first-aid kits appropriately.

d. Tourniquets will not be used when an accident occurs.

e. In accordance with ANSI Z358.1-2004 and comparable HN/EU standards, fixed- and plumbed-eyewash equipment must be available in operations employing acids and caustics, such as battery-charging areas and photography laboratories. Eyewash equipment must be flushed at least once a week and each flushing must be documented. Portable eyewashes will be replaced with fixed and plumbed equipment.

9. ACCIDENT AND MISHAP REPORTING

a. In accordance with AR 385-10, all accidents and mishaps must be immediately reported to the shop supervisor.

b. Accidents and mishaps should be reported using DA Form 285-AB.

c. Shop supervisors will—

(1) Immediately report all accidents and mishaps to the respective USAG safety office. The USAG safety office can provide specific forms. Depending on the severity of the accident, the USAG safety office may require additional reporting.

(2) Maintain an accident log onsite, which will consist of a binder or electronic folder with copies of DA Form 285-AB for all accidents that have occurred at the facility.

d. LN employees will use the *BALU* system for accident reporting, available at http://www.per.hqsareur.army.mil/services/safetydivision/balu_download.htm.

SECTION III ARTS-AND-CRAFTS FACILITIES

10. DESIGN AND LAYOUT

a. There must be at least 1 meter of free space on all sides of powered equipment, except those sides where a wall or other barrier prevents access to the equipment and protects shop users from moving parts or flying particles. Machines used with long or wide materials (for example, planers, table saws) must have enough free space to permit materials to feed in and out of the machines without creating a hazard.

b. The facility must have separate designated areas for activities that create safety or fire hazards (for example, spray painting, welding, woodworking). These areas will be located away from fire and emergency exits, but must have unobstructed access to fire and emergency exits. Emergency exits must not be obstructed or blocked.

c. Safety lanes must be clearly marked by yellow or yellow-and-black striped lines around work areas with powered and other potentially hazardous equipment. The edges of stairways, aisles, and passageways must also be clearly marked with yellow-and-black striped lines.

d. The design must meet all requirements of the current edition of the Unified Facilities Criteria 3-600-01. Changes in occupancy, operation, or major equipment must be coordinated with the USAG fire department before implementation to ensure they are code-compliant.

e. Floors must be covered with nonskid surfaces for users to stand on while operating hazardous equipment. If used, rubber mats must have beveled edges and be securely fastened to the floor. Floors must be free of gaps, clutter, and cords.

f. Baffles and acoustical tiles must be installed to reduce noise levels in areas where noise hazards occur such as around woodworking and other powered equipment.

g. Clamps or other devices must be used to secure equipment while it is in use. Benches, tables, and stands must be strong enough to prevent equipment from moving.

h. A place must be designated to store tools in a way that ensures the orderly issue and inventory of tools is possible and that prevents theft and unauthorized use. Tool-storage racks must be designed to prevent tools from falling and to protect their cutting edges from damage.

i. The shop supervisor will—

(1) Post danger and caution signs, including warnings for hazardous-noise levels and requirements for appropriate PPE, as required.

(2) Ensure that equipment instructions and safety precautions are available for each piece of equipment.

11. LIGHTING

a. Sufficient natural or artificial lighting is required in each workarea. For the types of facilities addressed in this regulation, the value considered “sufficient” by the Illumination Engineering Society of North America is illuminance category E, with an illuminance range on tasks from 50 to 100 footcandles.

b. Illumination must be measured each year during the IHS described in paragraph 4d.

12. VENTILATION

a. In favorable weather, bay windows and doors in most shops can provide adequate fresh air for many operations. For days of cold and inclement weather and at all times for some operations, forced mechanical ventilation may be required.

b. Each facility’s general ventilation system must provide fresh air for the facility. As required by industrial hygiene sampling data, potentially hazardous areas (for example, photography darkrooms, printing areas, woodworking rooms, auto-skills facilities) must have exhaust-ventilation systems. An exhaust-ventilation system is a negative-pressure system for removing contaminated air from a space. The system must have two or more of the following elements:

- (1) Discharge stack.
- (2) Duct work.
- (3) Dust-collecting equipment.
- (4) Enclosure or hood.
- (5) Exhauster.

c. The construction, installation, inspection, and maintenance of exhaust systems must conform to the principles and requirements in 29 CFR 1910.94 or the American Conference of Governmental Industrial Hygienists, *Industrial Ventilation, A Manual of Recommended Practice for Design*. Shop supervisors will ensure that hoses and ductwork are checked periodically for damage, obstructions, and leaks, and that required repairs are completed as soon as possible. Ventilation must be evaluated each year during the IHS described in paragraph 4d.

d. Specific ventilation-control requirements are in the sections for each respective process or piece of equipment addressed in this regulation.

13. STORAGE

a. Adequate space is required in each facility to safely store cleaning, maintenance, and crafts materials.

b. Storage areas must not block aisles, exits, or workspaces.

c. Shelves used for storage must be sturdy (for example, through secure fastening to walls).

d. An inventory list and MSDSs for all hazardous substances must be available in the immediate area of hazardous substances (for example, on a clipboard near storage cabinets). Shop supervisors will contact the USAG DPW environmental office to determine if a flammable storage cabinet or special hazardous-chemical storage is required.

e. All hazardous materials must be stored in locked areas or cabinets to prevent unauthorized access.

f. Paints and solvents must be stored separately from other kinds of supplies and not exposed to high temperatures. Paint and solvent containers must be kept closed except when the paint or solvent is in use.

g. Flammable and combustible liquids must be stored in compliance with the current edition of NFPA, code 30.

(1) Highly flammable liquids with flash points 100 degrees Fahrenheit (°F) or less (such as paint thinners and removers) must be stored in safety cans equipped with tight-fitting, spring-loaded, self-closing pouring spouts. A maximum of a 1-day supply will be stored in sheet-iron cabinets with tight-fitting joints and a door sill raised at least 2 inches above the bottom of the cabinet. Larger amounts of these materials will be stored in separate, noncombustible safety lockers.

(2) Flammable liquids with flash points more than 100 °F must be stored in 5-gallon or smaller containers. Up to 50 gallons of these liquids may be stored in a noncombustible safety locker.

h. Cylinders containing acetylene, propane, and other gases must be used and stored in an upright position away from highly combustible materials. Cylinders must not be exposed to sudden increases in temperature. They must be secured in place with chains and kept in an area where they will not be knocked, hit, mutilated, or allowed to fall.

i. Wood must be stored in clean, properly ventilated, and lighted areas in stable stacks or large racks designed for storage. Shop supervisors or safety managers must closely examine salvage or second-hand wood to ensure that defective material, nails, and metals have been removed before the wood is stored.

j. Scrap materials, unused or unserviceable equipment and materials, and remnants of discarded projects must be removed from the facility. Accountable items must be turned in to property-disposal authorities.

k. Special crafts materials that are highly flammable (for example, celluloids, films, pyroxylin) must be stored in accordance with applicable NFPA and HN codes, installation fire department SOPs and guidance, and manufacturer specifications. The shop supervisor must ensure that photography chemicals and jewelry-making acids and solutions are properly stored and controlled. All containers must be labeled.

l. Portable power tools must be stored separately to avoid accidental tangling with other tools. Cords must be coiled. To prevent deterioration of the cord and insulation, the motors of power tools must not be excessively oiled.

m. Storage racks with cushioned surfaces must be used to store glass. When necessary, glass must be properly secured.

14. HOUSEKEEPING

- a. Stairways, aisles, and passageways must be kept clear.
- b. Machine and tool tables must be kept clear.
- c. Floors must be kept clean, dry, and uncluttered. Floors should not be slippery or highly waxed. Stone floors and floors in power-tool rooms should not be waxed.
- d. Waste, wood shavings, paper, rubbish, and packing materials must be collected from floors, work surfaces, and equipment cabinets, and disposed of immediately. Wood dust and debris must be collected with a wet mop or industrial vacuum to minimize airborne dust. Rags containing oil, solvents, or paint must be disposed of in approved metal containers with tight-fitting lids. Broken glass must be stored in rigid bins with covers. Containers must be marked clearly. Accumulated waste or rubbish materials must not be left in the facility overnight.
- e. Only USAG-approved degreasing solvents will be used in arts-and-crafts facilities. When possible, more hazardous chemicals should be substituted with less hazardous ones for cleaning operations.
- f. Spilled oil, grease, or other liquids must be wiped up immediately. Oil and water leaks must be stopped at the source and contained as soon as possible. A noncombustible absorbent compound should be used to soak up oil. The USAG DPW environmental office will be consulted for approved absorbents.
- g. Shop users will clean the floors and workbenches in their workareas and the equipment they have used immediately after finishing their work.
- h. Shop supervisors will develop procedures to keep chemical containers (cleaning solvents, spray cans, varnish) under control and properly stored after use.

SECTION IV POWERED EQUIPMENT

NOTE: This section provides general requirements for powered equipment (electrical, pneumatic, spring-loaded). Appendix B has specific instructions and requirements for various pieces of powered equipment.

15. EQUIPMENT GUARDS AND SAFETY DEVICES

- a. Power-transmission parts (for example, belts, gears, pulleys, shafts) and other moving parts of powered equipment must be equipped with guards. Employees and users will not remove or disable these guards.
- b. On- and off-switches on powered equipment must be installed in a way that enables the operator to turn off the power immediately without having to leave the equipment unattended to do so. On- and off-switches will be the automatic, push-button type with the switch button protruding at least ¼ inch.

16. MARKING POWERED EQUIPMENT

If PPE is required, machinery and equipment must be marked according to OSHA and comparable HN/EU standards.

17. OPERATING POWERED EQUIPMENT

a. Powered equipment will not be used unless the appropriate guards are in place and operable. Point-of-operation guards must be used for machine cutting, drilling, forming, shaping, and similar operations involving moving parts that may cut, crush, or otherwise injure the operator. Guards must not be removed or adjusted without the permission of the shop supervisor. If an operation requires an adjustment or removal of a guard, the guard must be replaced in its normal position immediately after completing that operation.

b. The shop supervisor will provide push sticks or push blocks in several sizes and types to use while operating jointer or table saws.

c. Improvised jigs, fixtures, or parts that are not sturdy and not in accordance with accepted shop practices must not be used.

d. Powered equipment must be disconnected from the power source when not in use, and when removing safeguards or devices to make repairs or adjustments.

e. The shop supervisor will place “out-of-order” signs on equipment that is unsafe to operate when the equipment does not work properly, is missing guards, or requires repair. The shop supervisor will ensure that equipment that is out-of-order cannot be operated by mistake before the equipment is repaired. Lockout and tagout procedures on plugs and fuse boxes may be used to prevent the operation of defective equipment. Shop supervisors will create a record and file a repair request.

f. Shop supervisors will immediately remove dull, badly set, improperly filed, cracked, or improperly tensioned saw blades from service and immediately clean adhered gum from saw blades.

g. One-page SOPs for all machinery must be written in the language of users and posted at respective fixed-machine sites (app C and app D). SOPs should identify the location of users manuals for equipment.

18. PORTABLE POWER TOOLS

a. The shop supervisor will instruct shop users to examine portable power tools carefully before use to ensure that the cord, plug, switch, and other parts are in safe operating condition. Tools with defective cords, plugs, switches, or other parts must not be used.

b. Cords for portable power tools must be handled safely. Cords will not—

(1) Be hung over nails or sharp edges.

(2) Be strung along surfaces that shop users or vehicles may cross.

(3) Have contact with oil, hot surfaces, or chemicals. Cords must be kept moisture free.

- c. Portable power tools will not be used near flammable gases or vapors.
- d. Portable power tools that are normally equipped with safety guards (for example, grinders, power saws) will be used only with the guards in place.
- e. The casing of a portable electrical tool must be grounded while the tool is in use.
- f. Portable tools and appliances protected by an approved system of double insulation or its equivalent do not require grounding. These systems will be specially marked.
- g. The power source must be shut off before changing accessories on a portable powered tool.

19. ELECTRICAL PRECAUTIONS

- a. Shop supervisors will ensure that only properly grounded (three prongs) or double-insulated (appliance will either state “double insulated” or be marked with a square within a square) electrical equipment is used in arts-and-crafts facilities.
- b. Worn or broken electrical fixtures and cords must be replaced as soon as possible, and defective equipment must not be used. Unqualified persons should not make any attempts to repair equipment. Temporary wiring or makeshift repairs must not be used. All wires must be secured to electrical equipment.
- c. Electrical equipment not permanently connected to power sources must be disconnected while not in use.
- d. Shop supervisors will ensure that all circuit-breaker panels throughout the facility are labeled and that all electrical cords and wall outlets display voltage. Shop supervisors will ensure that shop users do not connect plugs to wall outlets with the wrong voltage.
- e. Electrical equipment should always be directly connected to fixed outlets. Extension cords are for temporary use only. Only one electrical cord should be used at a time. Electrical cords should not be used in series (“daisy chains”). Electrical cords must be labeled to show voltage and be of the correct rating for each piece of equipment or circuit to which they are connected.
- f. Grounded transformers are permissible when proper voltage is not available from wall outlets. The shop supervisor will ensure that equipment used with a transformer is properly grounded. Transformers must be placed in secure locations where heat accumulation will not occur. Transformers must be rated in watts to take the load of equipment to which they are connected.
- g. Electrical connections must be covered to prevent shop users or materials from making accidental contact. Plugs should only be connected to wall outlets with correct voltage.
- h. Only fuses rated for a particular circuit should be used. If a fuse burns out continuously, it should not be replaced with a higher rated fuse or with an alternative device unless the DPW provides approval.
- i. Only properly grounded adaptors (three prongs) should be used.

20. CLEANING POWERED EQUIPMENT

- a. All powered equipment must be disconnected from live circuits before cleaning the equipment.
- b. Powered equipment must not be cleaned with chemicals.
- c. If cleaning with compressed air, the pressure must be below 30 pounds per square inch. Work gloves made of leather or cotton, impact-resistant eye protection with a face shield, and single-hearing protection (earplugs or muffs) must be worn during compressed air cleaning.
- d. Shop supervisors must ensure that high-pressure steam cleaners are inspected at least once a year by a qualified person and will maintain inspection certificates on file. Waterproof gloves, impact-resistant eye protection with indirect venting (chemical goggles), a face shield, and single-hearing protection (earplugs or muffs) must be worn during steam cleaning.

SECTION V AUTO-SKILLS FACILITIES

21. GENERAL

- a. The shop supervisor or a person designated by the shop supervisor will supervise work in auto-skills facilities.
- b. Protection from carbon-monoxide poisoning must be provided in auto-skills facilities through adequate ventilation and exhaust controls. During testing, tuning, and other operations where vehicle engines are running, all bay doors will be opened. During winter months and inclement weather, hoses ducted outside of bay doors will be attached to vehicle exhausts. (Paragraph 12 provides general ventilation requirements.) Shop supervisors will ask their respective garrison IHs to evaluate emissions and recommend control requirements, as applicable, for automotive equipment and operations. This will be done as part of the annual IHS described in paragraph 4d.
- c. Maintenance pits must be kept clean, dry, and orderly. Maintenance pits must be illuminated in the 50 to 100 footcandle range (para 11).
- d. Maintenance pits must have exhaust ventilation at a rate of not less than 0.3 cubic meters per minute per square meter (1 cubic foot/min/square foot) of floor area at all times when the building is occupied or when vehicles are parked in or over those areas. Exhaust air will be taken from a point within 0.3 meters (12 inches) above the floor.
- e. Steps into maintenance pits must be noncombustible and slip-proof. When not in use, open maintenance pits must either be covered or protected on all sides by removable standard railings to prevent accidents. Gasoline or other substances used as cleaning solvents must not be used in maintenance pits.
- f. Paintspray guns may be used only in paintspray booths. These booths must be approved by the garrison fire department, safety office, and IH. Paintspray guns and spray-gun parts cleaners must be located at least 5 meters from possible sources of ignition (for example, electric air compressors).

g. Parts-cleaning equipment (for example, degreasers) will not use liquids with a flash point of less than 100 °F. If possible, more hazardous liquids should be substituted with less hazardous ones. MSDSs must be consulted to determine appropriate gloves. If MSDSs do not have specific information, the shop supervisor will consult the USAG safety office.

h. If cleaning with compressed air, the pressure must be below 30 pounds per square inch. Work gloves made of leather or cotton, impact-resistant eye protection with a face shield, and single-hearing protection (earplugs or muffs) must be worn during compressed air cleaning.

i. Shop supervisors will ensure that high-pressure steam cleaners are inspected at least once each year by a qualified person and will maintain inspection certificates on file. Waterproof gloves, impact-resistant eye protection with indirect venting (chemical goggles), a face shield, and single-hearing protection (earplugs or muffs) must be worn during steam cleaning.

j. Vehicle modifications prohibited by regulations (for example, AE Regulation 190-1 for Germany, AE Regulation 550-35 for the Netherlands, USASETAF Regulation 190-2 for Italy) or host-nation laws are unauthorized.

k. Automotive shop floors will be scraped, wire-brushed, or otherwise cleaned to prevent the buildup of grease.

l. In accordance with ANSI Z358.1-2004 and comparable HN/EU standards, a fixed- and plumbed-eyewash station must be available in automotive shop areas. Eyewash stations must be maintained in good working order and visibly marked and readily accessible to facility users. Portable eyewash stations may not be used.

22. LIFTING DEVICES

a. Jacks will be used for raising and lowering vehicles. Vehicles must not be left resting on jacks. Jacks must be replaced with car stands after raising the vehicle. No one will be allowed under a vehicle until regular car stands are in place.

b. There must be adequate space to safely move heavy items (for example, an engine removed for overhaul). Hoists should be securely mounted on supports that support the lifting weight. They should be placed in a way to not endanger shop users during operation. Objects must not be left hanging on hoists. Heavy items on stands or worktables must be blocked and secured to prevent slipping or falling.

c. Shop supervisors will—

(1) Have vehicle lifts and other lifting devices (for example, jacks, jack stands, pallet jacks, mobile cranes) load tested and inspected each year.

(2) Record results on a preventive-maintenance schedule and DD Form 314.

(3) Perform daily visual inspections on lifting equipment before use.

(4) Ensure that load capacity is visibly stenciled on each lifting device.

23. WELDING

a. An open flame must not be used in battery-recharging areas, because of highly flammable hydrogen gas that forms in the tops of battery cells during charging.

b. Welding or soldering must not occur on or near gas tanks or fuel lines. Welding or soldering should occur only in isolated safety areas under the direct supervision of the shop supervisor or a person designated by the shop supervisor. Welding privately owned vehicle (POV) frames is prohibited. A POV inspection station must inspect welding work done on crucial parts (for example, exhaust systems).

c. Shop supervisors will—

(1) Coordinate with the building manager to obtain a hot-work permit for welding operations in accordance with paragraph 6b(4).

(2) Provide leather aprons and full-arm leather gloves to those performing welding operations.

(3) Provide protective-face shields and eye protection to employees and users performing welding operations. In accordance with 29 CFR 1910.133, eye protection will have filter lenses to protect against radiant energy, based on the type of welding operation being performed (table 1).

Operation	Electrode Size 1/32 inch	Arc Current	Minimum Protective Shade (note 1)
Shielded metal arc welding	Less than 3	Less than 60	7
	3 - 5	60 - 160	8
	5 - 8	160 - 250	10
	More than 8	250 - 550	11
Gas metal arc welding and flux-cored arc welding		Less than 60	7
		60 - 160	10
		160 - 250	10
		250 - 550	10
Gas tungsten arc welding		Less than 50	8
		50 - 150	8
		150 - 500	10
Air carbon	(Light)	Less than 500	10
Arc cutting	(Heavy)	500 - 1,000	11
Plasma arc welding		Less than 20	6
		20 - 100	8
		100 - 400	10
		400 - 800	11
Plasma arc cutting	(Light) (note 2)	Less than 300	8
	(Medium) (note 2)	300 - 400	9
	(Heavy) (note 2)	400 - 800	10
Torch brazing			3

Table 1 Welding Operations			
Torch soldering			12
Carbon arc welding			14
<p>NOTES: 1. As a rule, start with a shade that is too dark to see the weld zone. Then go to a lighter shade that shows enough of the weld zone without going below the minimum. In oxyfuel gas welding or cutting where the torch produces a high yellow light, it is desirable to use a filter lens that absorbs the yellow or sodium line in the visible light of the (spectrum) operation.</p> <p>2. These values apply where the actual arc is clearly seen. Lighter filters may be used when the arc is hidden by the workpiece.</p>			

d. Spray paint should be sprayed only in approved painting areas away from welding or other operations involving heat or sparking.

e. Propane cylinders must be handled and stored as flammable material.

f. Cylinders must be stored with the valve-end up. Dropping or excessive jarring of cylinders should be prevented. Cylinders must be firmly anchored to tables, walls, or permanent structural supports to prevent tipping.

g. When lighting an acetylene torch, the acetylene valve must be at its minimum opening and the oxygen valve must be completely closed. A lighted torch should not be laid down or left unattended. All valves should be closed and the torch hose should be bled when finished. The torch valve must be kept closed when the cylinder is not in use.

h. Valves of empty cylinders for storage or shipping must be closed. The protective cylinder cap should be firmly affixed over the valve when a cylinder will be shipped.

SECTION VI STRIP YARDS

24. GENERAL

a. The shop supervisor or a person designated by the shop supervisor will supervise work at strip yards.

b. Customers are not authorized full access to strip-yard lots. Shop supervisors or delegated employees will maintain access control and ensure that customers do not enter the strip-yard lot from the office area while unaccompanied.

c. Accompanied customers are permitted to pull easily accessible and retrievable parts. Employees will perform more complicated part removal.

d. Fences are required around strip-yard facilities to prevent unauthorized access. Fences must be maintained in good repair. When a strip yard is closed, fences must be locked and secured.

e. The exterior of the property must be maintained in a clean and sanitary condition and must not be conducive to the breeding of insects or rodents. Toxic plants must be removed.

f. Property grading must not result in pooling or the collection of runoff on the property or on adjacent properties.

g. Strip-yard facilities must comply with the fire-protection requirements in paragraph 6.

h. Areas where flammable and combustible liquids and gas cylinders are stored must comply with the storage requirements in paragraph 13.

i. Welding operations at strip-yard facilities must conform to the requirements in paragraph 23.

j. When working on a car, employees will wear steel-toed boots and impact- and splash-resistant eye protection. Latex gloves are recommended for operations such as changing oil or draining antifreeze. Employees will wear leather work gloves when handling scrap metal or spare parts.

k. In accordance with ANSI Z358.1-2004 and comparable HN/EU standards, a fixed- and plumbed-eyewash station must be available in automotive shop areas. Eyewash stations must be maintained in good working order and visibly marked and readily accessible to facility users. Portable eyewash stations will not be used.

25. FACILITY INSPECTION AND CERTIFICATION

Each facility must be inspected and have a current certification in accordance with the German *Technischer Überwachungsverein (TÜV)* (Technical Control Association) Certification Procedure Number ZKRW 1280180.

SECTION VII SPECIALIZED AREAS AND SHOPS

26. KILN AREAS

Kiln areas must meet the requirements in 29 CFR 1910.265(f).

a. The DPW will ensure that all high-pressure steam lines located adjacent to kilns are covered with heat-resistant insulating material.

b. Shop supervisors will—

(1) Maintain kilns in a safe working condition. Shop supervisors must not allow the use of faulty kilns. Faulty kilns will be marked out-of-order and removed from service.

(2) Inspect pyrometers, electrical cords, elements, firebrick, and gas-burner heads before each kiln firing.

(3) Ensure that kilns are constructed on solid foundations and that there are adequate clearance and passageways around them.

(4) Ensure that kiln doors have a method of being held open while the kiln is being loaded.

(5) Provide aprons, tongs, and heat-resistant gloves to ceramists.

c. Users will—

(1) Operate kilns, both gas and electric, only while supervised by the shop supervisor or a person designated by the shop supervisor.

(2) Not open kiln doors during firing and for 8 hours after firing.

(3) Keep kiln areas free of flammable and combustible materials.

d. The kiln room or firing area will be off limits to users except when the shop supervisor permits users to enter. The shop supervisor will enforce this restriction to prevent injuries to shop users and damage to kilns. During firing and cooling periods, the shop supervisor will attach a sign to the door of the kiln room indicating that the kiln is in operation.

e. Kilns must meet the standards in NFPA 86. The installation of new kilns will be coordinated beforehand with the USAG fire department. The USAG fire department will determine if and which fire-protection engineering improvements are required. (Paragraph 6 provides more fire-safety precautions.)

27. CARPENTRY AND FRAMING

a. Section IV and appendix B provide standards and instructions for equipment found in carpentry and framing shops.

b. Users will not perform maintenance on carpentry and framing equipment.

c. Users must wear—

(1) Appropriate hearing protection when any equipment is in operation in carpentry and framing shops.

(2) Impact-resistant eye protection or impact-resistant eye protection with side shields when operating any piece of equipment.

28. PHOTOGRAPHY SHOPS

a. The shop supervisor will—

(1) Supervise the use of the photography shop.

(2) Control the use of acids and photographic chemicals. If possible, more hazardous chemicals should be substituted with less hazardous ones in processes.

(3) Be the only person who mixes solutions.

(4) Approve or disapprove the use of photographic materials not normally available in the shop.

(5) Provide protective aprons and gloves to users and employees in accordance with MSDSs for chemicals being used. When no MSDS recommendations are available, the shop supervisor will contact the USAG safety office for recommendations.

(6) Provide chemical splash-resistant eye protection to users and employees.

b. In accordance with ANSI Z358.1-2004 and comparable HN/EU standards, a fixed- and plumbed-eyewash station must be available in photography-shop areas. Eyewash stations must be maintained in good working order and visibly marked and readily accessible to facility users. Portable eyewash stations will not be used.

c. Paragraph 12 provides general ventilation requirements. Shop supervisors will contact their garrison IHS to evaluate specific ventilation requirements for photographic equipment. This may be done as part of the annual IHS described in paragraph 4d.

29. JEWELRY-MAKING

Chemicals used in jewelry-making are similar to those used in photography shops. Refer to paragraph 28 for requirements on managing chemicals in jewelry-making. PPE required for photography shops will also apply to jewelry-making.

APPENDIX A REFERENCES

SECTION I PUBLICATIONS

Part 1910, Title 29, Code of Federal Regulations, Occupational Safety and Health Standards

AR 25-400-2, The Army Records Information Management System (ARIMS)

AR 385-10, The Army Safety Program

AR 420-1, Army Facilities Management

DA Pamphlet 40-501, Hearing Conservation Program

AE Regulation 190-1, Driver and Vehicle Requirements and the Installation Traffic Code for the U.S. Forces in Germany

AE Regulation 385-40, Accident Reporting and Records

AE Regulation 550-35, Regulations on Personal Property, Local Currency, and Motor Vehicles for U.S. Personnel in the Netherlands

USASETAF Regulation 190-2, Traffic Supervision and Privately Owned Vehicle Operator Licenses

SECTION II STANDARDS

American Conference of Governmental Industrial Hygienists, Industrial Ventilation: A Manual of Recommended Practice for Design, 26th Edition, 2007

American National Standards Institute (ANSI) Z308.1-2003, Minimum Requirements for Workplace First Aid Kits

American National Standards Institute (ANSI) Z358.1-2004, Emergency Eyewash and Shower Equipment

National Fire Protection Association (NFPA) Fire Codes NFPA 30 and 86

Unified Facilities Criteria 3-600-01, Fire Protection Engineering for Facilities

Illuminating Engineering Society of North America Lighting Handbook, Reference and Application, 8th Edition, 1993

SECTION III FORMS

DD Form 314, Preventive Maintenance Schedule and Record

DA Form 285-AB, U.S. Army Abbreviated Ground Accident Report (AGAR)

DA Form 2028, Recommended Changes to Publications and Blank Forms

APPENDIX B

SPECIFIC INSTRUCTIONS AND REQUIREMENTS FOR POWERED EQUIPMENT

B-1. GENERAL

a. In general, equipment mentioned in this appendix generates large diameter wood and occasionally metal particulate that may require the use of dust-collection devices. Hood requirements are specified below for some pieces of equipment. For all powered carpentry equipment, shop supervisors will contact their respective garrison United States Army Center for Health Promotion and Preventive Medicine - Europe industrial hygienist to evaluate emissions and recommend control requirements. This will be done as part of the annual industrial hygiene survey described in paragraph 4d.

b. All machines designed for fixed locations must be securely anchored to prevent moving.

c. Shop supervisors will use the equipment listed in this appendix to maintain carpentry and framing equipment. They must enforce Part 1910, Title 29, Code of Federal Regulations (29 CFR 1910), standards and use the information in paragraphs B-2 through B-12 to train shop users how to operate specific equipment.

B-2. DRILL PRESS

a. Switch off the power before shifting the belt or making other adjustments.

b. Remove the chuck key immediately after using it.

c. Use the drill-press vise when possible. Clamp the vise or the work to the drill-press table.

d. Use a brush, not bare hands, to remove chips from the workarea.

e. Ensure that all drill presses have safeguards to prevent fingers or other body parts from coming in contact with the drill press.

B-3. GRINDER

a. Before starting, check the grinder wheel for cracks or looseness on the spindle.

b. Set the tool rest at least 1 inch from the wheel.

c. Adjust the safety-guard shield.

d. Do not use the grinder if both safety guards are not in place.

e. Hold large work with both hands. Ask the shop supervisor for special instructions and permission to grind small pieces. Use a small vise for grinding small pieces.

f. Use only the face of the wheel.

g. Do not use stationary electric grinders unless they have safety guards and side hoods installed.

B-4. BAND SAW

- a. Cut only wood that has a flat surface.
- b. Make adjustments only when the machine is at a dead stop.
- c. Set the upper saw guide $\frac{1}{4}$ inch or less above the wood to be cut.
- d. Allow the machine to come to a dead stop before backing the saw out of a long cut.
- e. Use relief cuts when sawing sharp curves.
- f. Ensure that each bandsaw machine has a tension-control device to indicate a proper tension for the standard saws used on the machine. This helps eliminate saw breakage due to improper tension.
- g. Protect feed rolls of band resaws with a suitable guard to prevent the hands of the operator from coming in contact with the in-running rolls. The guard must be constructed of heavy material, preferably metal. The edge of the guard will come to within $\frac{3}{8}$ inch of the plane formed by the inside face of the feed roll in contact with the stock being cut.
- h. Ensure that bandsaw wheels are fully encased. The outside periphery of the enclosure must be solid. The front and back of the band wheels must be enclosed by solid material, wire mesh, or finely perforated metal.

B-5. CIRCULAR SAW

- a. Ensure that wood is free from loose knots, nails, foreign items, sand, and paint.
- b. Make adjustments only when the machine is at a dead stop.
- c. Limit saw-blade extensions to $\frac{1}{4}$ inch or less above the wood-cutting surface.
- d. Before operating the saw, ensure that guards are attached and that other safety devices are in their proper places.
- e. Stand to one side of the line of the saw to avoid possible kickback.
- f. The shop supervisor will provide push sticks to use when ripping narrow pieces of wood.
- g. Use two people to cut long or large pieces of wood.
- h. Protect feed rolls and saws with a hood or guard to prevent the hands of the operator from coming in contact with the in-running rolls. The guard must be constructed of heavy material, preferably metal, and the bottom of the guard must come down to within $\frac{3}{8}$ inch of the plane formed by the bottom of the working surfaces of the feed rolls.
- i. Ensure that each self-feed circular rip saw has sectional non-kickback fingers for the full width of the feed rolls. These must be located in front of the saw and so arranged as to be in continual contact with the wood being fed.

B-6. SCROLL SAW

- a. Cut only wood that has a flat bottom surface.
- b. Make adjustments only when the machine is at a dead stop.
- c. Check the blade for correct tension.
- d. Adjust the hold-down safety device to within ½ inch of the wood.
- e. Use relief cuts when sawing sharp curves.
- f. Ensure that all portions of the saw blade are enclosed or guarded, except for the working portion of the blade. This will help prevent fingers of operators from coming in contact with the blade.

B-7. JOINTER

- a. Inspect wood for cracks, loose knots, nails, and other defects.
- b. Use only wood that is 12 inches or longer on the jointer.
- c. Before using the jointer, ensure that guards are in place and operable.
- d. Make adjustments only when the machine is at a dead stop.
- e. Limit cuts to a maximum of $\frac{1}{16}$ inch.
- f. Only shop supervisors may approve unusual setups, including those for stop cuts, beveling, rabbeting, or tapering.
- g. Ensure that each hand-fed planer and jointer with a horizontal head is equipped with a cylindrical cutting head, the knife projection of which must not exceed $\frac{1}{8}$ inch beyond the cylindrical body of the head.
- h. Ensure that the opening in the table is kept as small as possible. The clearance between the edge of the rear table and the cutter head must be no more than $\frac{1}{8}$ inch. The table-throat opening must be no more than 2½ inches when tables are set or aligned with each other for zero cut.
- i. Ensure that each hand-fed jointer with a horizontal cutting head has an automatic guard that covers the entire section of the head on the working side of the fence or gage. The guard must effectively keep the operator's hand from coming in contact with the revolving knives. The guard must automatically adjust itself to cover the unused portion of the head and must remain in contact with the material at all times.
- j. Ensure that each hand-fed jointer with a cutting head has a guard that covers the section behind the gage or fence.
- k. Ensure that each wood jointer with a vertical head has an exhaust hood or other guard. The exhaust hood or other guard must be arranged to completely enclose the revolving head, except for a slot of such width as may be necessary and convenient for the application of the material to be joined.

B-8. WOOD PLANER

- a. Use only clean wood that is free of knots, nails, and other defects.
- b. Make sure that the length of the wood is twice as long as the distance between the centers of the feed rolls.
- c. Limit cuts on wood to $\frac{1}{16}$ inch or less.
- d. Allow the wood to travel completely through the planer before making an additional depth-of-cut adjustment. Make adjustments only when the machine is at a dead stop.
- e. Stand to one side when feeding the planer to avoid possible kickback.
- f. Ensure that each planer has all cutting heads and saws, if used, covered by a metal guard. If the guard is constructed of sheet metal, the material used must not be less than $\frac{1}{16}$ inch in thickness. If cast iron is used, the guard must not be less than $\frac{3}{16}$ inch in thickness.
- g. Ensure that when an exhaust system is used, the guards form part of the exhaust hood.
- h. Ensure that feed rolls are guarded by a hood or suitable guard to prevent the hands of the operator from coming in contact with the in-running rolls. The guard must be fastened to the frame carrying the rolls so as to remain in adjustment for any thickness of stock.

B-9. SANDER

- a. Hold the machine securely.
- b. Check the belt or disc for breaks or tears.
- c. Make adjustments or replacements only when the machine is at a dead stop.
- d. Sand on the downward motion side of the disc sander.
- e. Protect feed rolls of self-feed sanding machines with a semicylindrical guard to prevent the hands of the operator from coming in contact with the in-running rolls. The guard must be constructed of heavy material, preferably metal, and firmly secured to the frame carrying the rolls in order to remain adjusted for any thickness of stock. The bottom of the guard should come down to within $\frac{3}{8}$ inch of a plane formed by the bottom or contact face of the feed roll where it touches the stock.
- f. Ensure that each drum-sanding machine has an exhaust hood or other guard if an exhaust system is not required. The exhaust hood or other guard must be arranged to enclose the revolving drum, except for that portion of the drum above the table, if a table is used, that may be necessary and convenient for the application of the material to be finished.
- g. Ensure that each disk-sanding machine has an exhaust hood or other guard if an exhaust system is not required. The exhaust hood or other guard must be arranged to enclose the revolving disk, except for that portion of the disk above the table, if a table is used, that may be necessary and convenient for the application of the material to be finished.

h. Ensure that belt-sanding machines have guards at each nip point where the sanding belt runs onto a pulley. These guards must effectively prevent the hands and fingers of the operator from coming in contact with the nip points. The unused run of the sanding belt must be guarded against accidental contact.

B-10. WOOD-TURNING LATHE

- a. Roll long shirtsleeves up above the elbows and remove or fasten loose clothing.
- b. Ensure the wood is free of cracks, knots, and other defects.
- c. Ensure wood is correctly mounted in the lathe.
- d. Use oil or beeswax on the dead center.
- e. Clamp the tool-rest holder firmly.
- f. After inserting a piece of wood, stand aside and start the lathe at its lowest speed. Let the lathe run for approximately 1 minute, then stop the lathe and tighten the wood before beginning.
- g. Keep the tool rest as close as possible to the wood by making frequent adjustments.
- h. Remove the tool rest while sanding and finishing.
- i. Use only a small rag folded into a pad for polishing work.
- j. Ensure that each lathe has all cutting heads covered by a metal guard. If the guard is constructed of sheet metal, the material used must not be less than $\frac{1}{16}$ inch in thickness. If cast iron is used, it must not be less than $\frac{3}{16}$ inch in thickness.
- k. Ensure that when an exhaust system is used, the guards form part or all of the exhaust hood.
- l. Ensure that feed rolls are guarded by a hood or suitable guard to prevent the hands of the operator from coming in contact with the in-running rolls. The guard must be fastened to the frame carrying the rolls in order to remain adjusted for any thickness of stock.

B-11. RADIAL ARM SAW

- a. Check with the shop supervisor before making special setup cuts.
- b. Make adjustments only when the machine is at a dead stop.
- c. Hold the wood firmly against the table-guide strip.
- d. Keep hands away from the path of the blade.
- e. When ripping wood, use the anti-kickback guard.
- f. Support the handle with the heel of the hand when pulling the blade through the wood.

g. Do not use the radial-arm saw unless the saw has a stop to prevent it from swinging out beyond the front edge of the table. An extension may be added to the table. The radial-arm saw must be equipped with a spring-loaded or gravitational device that will return the saw assembly automatically to the rear of the table when released at any point of its operation.

h. Ensure that all portions of the saw blade are enclosed or guarded, except for the working portion of the blade between the bottom of the guide rolls and its table.

B-12. CUTOFF SWITCHES

a. Turn a machine off immediately if difficulty arises with the machine or with the material. A mechanical or electrical power control must be provided on each machine to make it possible for operators to cut off the power from each machine without leaving their position at the point of operation. On applications where injury to the operator might result if motors were to restart after power failures, provisions must be made to prevent machines from automatically restarting when power is restored.

b. Do not make adjustments or corrections around cutting or moving parts of a machine while the machine is in operation. Power controls and operating controls should be located within easy reach of operators while they are at their regular work locations, making it unnecessary for them to reach over the cutter to make adjustments.

APPENDIX C

SAMPLE HAZARD ANALYSIS WORKSHEET FOR INDUSTRIAL EQUIPMENT - TABLE SAW

Task	Hazard	Cause	Prevention
	Inhalation	Dust and particles generated during machine operation	Appropriate natural ventilation, respirators (when needed), automatic vacuum dust collector
	Eye injury	Projectiles	Safety glasses with side shields or appropriate safety goggles
	Trauma	Projectiles, rotating parts, points of operation, in-going nip points, flying chips and sparks, loose clothing	Situational awareness, personal protective clothing and equipment (PPC&E), machine guards, rolled up sleeves, appropriate clothing, jewelry removed
	Foot injury	Drop object on foot	Safety shoes
	Hand injury	Points of operation, in-going nip points, rotating parts, flying chips and sparks, rings	Gloves, machine guards, situational awareness, jewelry removed
	Face protection	Projectiles	Face shield (when needed)
	Fire	Sparks	Appropriately placed fire extinguisher, remove all combustibles and fire hazards from machine area
	Noise	Machine operation	Hearing protection (earplugs or muffs)
	Electrical shock	Improper grounding, improper operations and maintenance	Lockout/tag out, proper grounding of frame, manufacturer instructions strictly followed

PPC&E

PPC&E should be worn when needed and includes the following:

- Disposable respirators.
- Face shields.
- Goggles.
- Hearing protection.
- Safety glasses with side shields.
- Safety shoes.

Equipment Procedures, Job Requirements, and Awareness Information

1. Equipment must be operated in accordance with manufacturer instructions and 29 CFR 1910.212 and 1910.213.
2. Only trained and authorized users may operate equipment.
3. A mechanical or electrical power control must be provided to make it possible for the operator to cut off power without leaving his or her position at the point of operation.
4. All belts, gears, pulleys, and shafts must be guarded in accordance with 29 CFR 1910.219.
5. Machines designed for a fixed location must be securely anchored to prevent moving.

6. One or more methods of machine guarding must be provided to protect the operator and other employees in the area from hazards such as those created by points of operation, in-going nip points, rotating parts, and flying chips and sparks.
7. All portions of the saw blade must be enclosed or guarded, except for the working portion of the blade between the bottom of the guide rolls and the table.
8. Jewelry or loose-fitting clothing must not be worn.
9. Push sticks must be used when required as for “non-thru” cuts and when ripping narrow work.
10. Operators may never reach in front of or over the saw blade.
11. Jammed or cut-off pieces must not be removed until the blade has stopped.
12. Any observed defect or safety hazard must be reported to the supervisor immediately.
13. Safety shoes must be worn where any object handled would possibly cause injury to feet if dropped.
14. Appropriate gloves must be worn where any object handled could possibly cause cuts, punctures, or abrasions to hands. (Exception: where rotating machinery presents a greater hazard of entangling gloves, they are optional with written justification.)
15. Hands, hair, and loose clothing must be kept clear of all moving parts.



USAG Schinnen Installation Safety Office
Mission Possible – Mission Safe



APPENDIX D
 SAMPLE GERMAN INSTRUCTIONS FOR MILLING MACHINES

Westfälische
 Wilhelms-Universität
 Münster

Betriebsanweisung

für Arbeiten an
Fräsmaschinen

[Institut/Einrichtung Z.1]
 [Institut/Einrichtung Z.2]
 [Raum/Bereich]
 [Arbeitsplatz]

Gefahren für Mensch und Umwelt



- Erfassen von Kleidung und Haaren durch offenen Antrieb, Frässpindel.
- Fräser oder herumschleuderndes Werkstück bzw. Werkzeugteil.
- Verletzungen durch wegfliegende Teile oder Späne.
- Schnittverletzungen durch Späne.
- Mögliche Hautschäden u. Allergien beim Umgang mit Kühlschmierstoffen.
- Gehörschäden durch hohe Lärmpegel möglich.

Schutzmaßnahmen und Verhaltensregeln



- Nur eingewiesene Mitarbeiter dürfen die Fräsmaschinen benutzen.
- Auf festen Sitz des Maschinenschraubstocks achten.
- Werkstück fest einspannen.
- Werkzeug- und Werkstückwechsel nur bei Stillstand der Maschine.
- Maschinenschraubstock vor Verdrehen sichern.



- Späne nur mit Spänehooken, Besen, Pinsel oder Industriesauger entfernen.
- Zur Reinigung keine Pressluft verwenden.
- Lange Haare durch Haarnetz oder Mütze verdecken.
- Schutzbrille, Schutzschuhe und Gehörschutz tragen.



- Eng anliegende Kleidung tragen.
- Das Tragen von Schmuck ist verboten.
- Das Tragen von Handschuhen ist verboten.
- Hautschutzcreme vor der Arbeit / Hautpflegecreme nach der Arbeit.



Verhalten bei Störungen

- Bei Bruch oder Festsetzen des Werkzeuges sowie bei herumschleudernden Teilen ist die Maschine sofort stillzusetzen.
- Die Störung darf nur im Stillstand beseitigt werden.
- Der Vorgesetzte ist umgehend über Mängel / Störungen zu informieren.

Erste Hilfe



Notruf: 112

- Ersthelfer informieren (siehe Alarmplan).
- Kleinere Verletzungen sofort versorgen.
- Eintragung in das Verbandbuch vornehmen.
- Bei größeren Verletzungen ist ein Durchgangsarzt aufzusuchen (siehe Info „Erste Hilfe“) bzw. über Tel. 112 der Notarzt zu benachrichtigen.
- Vorgesetzten informieren.

Instandhaltung, Entsorgung

- Instandsetzung / Reparaturen nur durch beauftragte und befähigte Personen durchführen lassen.
- Späne in Spänebehälter separat sammeln.
- Kühlschmierstoffe regelmäßig nach Plan kontrollieren und gegebenenfalls auswechseln.

GLOSSARY

AE	Army in Europe
ANSI	American National Standards Institute
APF	appropriated fund
AR	Army regulation
ARIMS	Army Records Information Management System
CFR	Code of Federal Regulations
DA	Department of the Army
DD	Department of Defense
DPW	directorate of public works
°F	degrees Fahrenheit
F&ES	fire and emergency services
FMWR	Family and morale, welfare, and recreation
HN	host nation
HN/EU	host nation/European Union
IH	industrial hygienist
IHS	industrial hygiene survey
IMCOM-Europe	United States Army Installation Management Command, Europe Region
JHA	job hazard analysis
LN	local national
MSDS	material safety datasheet
NAF	nonappropriated fund
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
POV	privately owned vehicle
PPC&E	personal protective clothing and equipment
PPE	personal protective equipment
SOP	standing operating procedure
TÜV	<i>Technischer Überwachungsverein</i> (Technical Control Association)
U.S.	United States
USAG	United States Army garrison
USASETAF	United States Army Southern European Task Force