

Title: Machine Guarding Procedure
Effective Date: November 2005
Revision Date: January 13, 2017
Issuing Authority: VP, Facilities and Construction Management
Responsible Officer: Director Environmental Health and Safety

PURPOSE OF THE PROCEDURE

To minimize the incidence of employee injuries from machines and equipment as per OSHA 1910.212.

SCOPE OF THIS PROCEDURE

This procedure covers the safe use and proper guarding of powered machines utilized in all NYU facilities.

WHO NEEDS TO KNOW THIS PROCEDURE

All New York University academic, commercial and residential facilities that use powered machines in shops or other maintenance areas.

PROCEDURES FOR IMPLEMENTATION

Responsibilities:

Department of Environmental Health and Safety

Environmental Health & Safety will be responsible for conducting annual inspections of Machine Shops in the areas of safety and training. Environmental Health & Safety will also ensure that the Supervisors are trained annually as well as all machine users.

Facilities Manager, Department Manager, Construction Manager and Supervisors

The Supervisor will be responsible for implementing the Machine Guarding Safety Procedure in their respective areas. This will include assuring that their Machine Operators follow all policies and procedures related to the safe operation of all shop machines, and will take corrective action in the event that an operator violates the established safe operating procedures.

The Supervisor will ensure that only those operators who have been trained to operate the shop machines will be allowed to do so. Employees will receive training prior to operating any shop machines. The Supervisor will maintain all required training documentation within their department.

Following the initial training, all operators will be required to take an Annual Training Refresher from their supervisor. The Operator will also conduct a Self-Audit Safety Checklist detailing the items to be reviewed prior to operation, also provided by their supervisor.

UNIVERSITY PROCEDURE

Machinery with Moving Parts:

1. Whenever there is a possibility that operators may come in contact with moving mechanical parts, they shall be safely enclosed in affixed machine guards or placed behind barricades as to prevent operators from gaining access to the area of moving parts.
2. Machines requiring a guard shall not be used if the guard is missing or defective. The missing or defective guard should be reported to the supervisor immediately and replaced before the machine is operated. Only guards specified by the machine's manufacturer shall be used.
3. Machine guards should be removed only for the purposes of servicing the machine. No guard, barrier, or enclosure shall be adjusted or removed from the machinery by an operator for any reason unless permission has been given by the supervisor to do so.
4. Procedures for Servicing Machinery with Moving Parts
 - a. Prior to guards or other guarding devices being removed for servicing, a zero mechanical state (ZMS) for the machine shall be achieved. All power sources to the machine (electrical, pressurized fluids and pressurized gases) shall be isolated from the machine. All electrical sources shall be turned off at the main breaker. The breaker shall be locked out and tagged with a warning sign by the person performing the servicing. Only one key shall be available and should be kept by the servicing person. As a check to test if ZMS has been achieved, the servicing person should press the "start" button(s). No moving part should be activated.
 - b. Following the servicing, the guarding shall be replaced. Once it is securely affixed, the lock and tag on the main breaker may be removed

Proper Personal Protection Equipment (PPE):

Proper PPE including eye protection, hand protection and foot protection must be worn in accordance with NYU Procedures for the Use and Selection of Personal Protective Equipment and OSHA 1910.132 dealing with the use and selection of PPE.

Inadequate Clothing

Operators should not wear loose clothing, watches, rings or other jewelry while operating or being in close proximity to mechanical equipment with moving parts. For persons with long hair, it should be bound and kept as to eliminate the potential of getting it caught in moving parts.

Training

1. Initial Training
 - a. Supervisors will train machine operators in the operation of machinery used in their respective job assignment(s). Manuals explaining a machine's operation and maintenance should be provided by the manufacturer and shall be accessible to all operators and supervisors.
2. Annual Refresher Training

- a. Annual Refresher Training is provided by the supervisor. The supervisor will keep a copy of those who are trained as well as send a copy of the completed training to Environmental Health & Safety. Please contact Environmental Health & Safety for any questions on training at 81450.

Records

An inventory spreadsheet list is kept at Environmental Health & Safety of all machines per department requiring safeguarding. Please notify Environmental Health & Safety of any changes in department inventory of machines. Environmental Health & Safety will perform an annual safety inspection of the shop practices of all machines and this will also be filed at Environmental Health & Safety.

Program Evaluation

An annual self-audit evaluation of the work area shall be performed by operators and supervisors and a completed copy sent to Environmental Health & Safety. Please notify Environmental Health & Safety of any discrepancies that may result from the self-audit. If there are changes in operators or equipment, the audit should be conducted more frequently and a completed self-audit sent to Environmental Health & Safety. A template Self-Audit Evaluation is located below for use by shop supervisors.

Machines and Machine Guarding Self-Audit Checklist

Operator's Name (print): _____ Supervisor _____

Building: _____

Room: _____

Date: _____

Check only if machine complies. If machine does not, mark NO next statement.

1. Guards prevent worker's hands, arms, or other body parts from making contact with moving parts.
2. Guards firmly secured and not easily removable.
3. Guards permit safe, comfortable, and relatively easy operation of the machine.
4. Machine controls within easy reach of the operator.
5. Procedures established to ensure machine is shut down before guard is removed.
6. Point-of-operation guards provided and in place.
7. Gears, sprockets, pulleys, and flywheels guarded.
8. Belts and chain drives guarded.
9. Exposed set screws, key ways, collars, and the like guarded.
10. Guards provide for any other hazardous moving part of the machine.
11. Noise measurements taken, where necessary.
12. Substances used in machine operation evaluated.
13. Electrical cords or connectors in good repair.
14. Personal protective equipment available, where necessary.
15. Operator dressed safely for the job.
16. Workers trained in the recognition of machine hazards and the importance of using safeguards.
17. Lockout/tagout training provided, where necessary.
18. Personal protective equipment training provided, where necessary.

Overall Condition (Circle One): **Satisfactory** **Unsatisfactory**

Comments _____

Supervisor: _____
(Print name) (Sign name & date)

Key to Machine Guarding Checklist

The Supervisor is responsible for covering required topics for successful training. Below is a key that should accompany the Self-Audit Checklist. Keep in mind that the test and key may need to be tailored to fit your work area.

Key to Machines and Machine Guarding Self-Audit Checklist

1. Guards should be designed to prevent contact with any machine part, function, or process that could cause an injury.
2. Guards should be made of durable material that will withstand the conditions of normal use and should not be able to be easily removed or tampered with.
3. Machine guard design should allow normal operations to occur without creating any additional hazards.
4. If possible, machine design should allow for routine lubrication and adjustment without removal of safeguards. When safeguards must be removed, safe procedures must be developed to insure that the machine has been shut down. A lockout/tagout program may be necessary.
5. Point-of-operation is the point where work is performed on the material, such as cutting, shaping, boring, or forming of stock. Point-of-operation guarding is complicated by the number and complexity of machines and by the different uses of individual machines.
6. Rotating parts (even smooth, slowly rotating shafts) can grip clothing or, through mere skin contact, force a hand or arm into a dangerous position. Guard should be designed to allow no contact with rotating parts. Operator should avoid wearing loose fitting clothing.
7. Belts and chain drives create in-running nip point hazards where the belt or chain contacts the pulley or sprocket. Guards should be designed to allow no contact.
8. The normal hazards associated with rotating parts increase with projections such as set screws, key ways, etc., and must be guarded to prevent contact.
9. Reciprocating and transverse motions of machine parts are examples of other hazards which require guarding.
10. Some machines are capable of producing noise levels, which require hearing protection. Contact Environmental Health & Safety for information or assistance in measuring machine noise levels.
11. Cutting fluids, coolants, and any other substance used in machine operations should be evaluated before use. The substance's SDS, container label, or other product information can be helpful in determining if additional precautions will be necessary. Dispose of such chemical items as hazardous waste.

12. Replace frayed, exposed, or deteriorated wiring.
13. A hazard evaluation of the tasks that machine operators perform will help in determining if personal protective equipment is necessary. Please contact Environmental Health & Safety if you need assistance.
14. Loose-fitting clothing and jewelry should not be worn by machine operators. Long hair can also become entangled in rotating parts.
15. Training should be provided by the individual department supervisors. For assistance or questions on shop training please contact Environmental Health & Safety at 81450.
16. Training is required for all workers authorized to apply lockout/tagout devices. Training is also required for workers who are affected by the lockout/tagout activities of authorized workers. General Training is provided by contacting Environmental Health & Safety.
17. Workers/Operators must receive adequate training on Personal Protective Equipment selection and use.

RELATED POLICIES

NYU Environmental Health and Safety Policy

RELEVANT RESOURCES

OSHA 29CFR 1010.212