EASTERN MICHIGAN UNIVERSITY

LOCKOUT/TAGOUT

PROGRAM

DO NOT OPERATE

Maintenance Department

This lock/tag may only be removed by:

Name: ____________________________
Dept: ____________________________
Expected Completion: _______________

W.H. Brady Co. Cat. No.45503

Department of Public Safety
Health and Safety Office
123 Structure Drive
Ypsilanti, MI 48197
(313) 487-1222
# EASTERN MICHIGAN UNIVERSITY

## LOCKOUT/TAGOUT

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### Appendix 1: Lockout/Tagout Periodic Inspection Form

### Appendix 2: Supervisors Release Form

### Appendix 3: Lockout/Tagout Attendance Sheet

Prepared by the Health and Safety Office and Physical Plant - February 1996
EASTERN MICHIGAN UNIVERSITY
LOCKOUT/TAGOUT PROGRAM

PURPOSE

The purpose of this Lockout/Tagout Program is to protect individuals servicing and maintaining machines and equipment from the unexpected energization or start up of the machines/equipment or the release of stored energy which could cause injury. This Lockout/Tagout Program has been written to achieve compliance with the Michigan Occupational Safety and Health Administration Standards Part 85 The Control of Hazardous Energy Sources and Part 40 Electrical Safety-Related Work Practices.

SCOPE AND APPLICATION

This procedure applies to all Eastern Michigan University employees servicing, and/or maintaining machinery and equipment.

POLICY

Prior to servicing and/or maintaining machines and equipment, the lockout/tagout procedures, which follow, shall be implemented to assure employees are not exposed to unexpected machine motion or release of energy.

All authorized employees shall receive training regarding the recognition of hazardous energy sources and the methods for their isolation. Each authorized employee shall be instructed on the purpose and use of lockout/tagout procedures in accordance with this Lockout/Tagout Program.

All affected employees shall receive training regarding the Lockout/Tagout Program, including recognition of lockout/tagout devices and the purpose of their use. All employees shall be trained not to remove a lockout and/or tagout device unless it is their own.

DEFINITIONS

Affected Employee - An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in the immediate area in which such servicing or maintenance is being performed.

Authorized Employee - An employee who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this section.
**Capable of Being Locked Out** - An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability.

**Energized** - Connected to an energy source or containing residual or stored energy.

**Energy Isolating Device** - A mechanical device which physically prevents the transmission or release of energy, including but not limited to the following: a manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors; a line valve; a block; and any similar device used to block or isolate energy. NOTE: Push buttons, selector switches, and other control circuit type devices are not energy isolating devices.

**Energy Source** - Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

**Lockout** - The placement of a lockout device on any energy isolating device, in accordance with this procedure, which ensures the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

**Lockout Device** - A device utilizing a positive means such as a lock, either key or combination type, or hold an energy isolating device in a safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

**Lockout/Tagout** - The term lockout/tagout indicates both a lock and tag are used to remove equipment from service. Only locks and tags approved for Lockout/Tagout are to be used.

**Qualified Person** - Persons who have training and/or experience in avoiding the electrical hazards of working on or near energized equipment.

**Servicing and/or Maintaining** - Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

**Tagout** - The placement of a tagout device on any energy isolating device, in accordance with this procedure to indicate the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

**Tagout Device** - A prominent warning device such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with this procedure to indicate the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.
RESPONSIBILITIES

DEANS, DIRECTORS, DEPARTMENT HEADS

• Ensure the means to comply with lockout/tagout procedures are provided.
• Provide support to supervisors responsible for implementing lockout/tagout.

SUPERVISORS

• Shall train new employees and periodically retrain all of their employees on lockout/tagout procedures.
• Shall ensure the locks, tags, and other devices required for compliance with lockout/tagout procedures are provided to their employees.
• At least annually, supervisors shall conduct and document site visits of each employee to ensure the lockout/tagout procedures are being adhered to.
• Shall promptly investigate and document all lockout/tagout related on-the-job accidents, near misses and/or related health problems. Copies of these reports shall be sent to the Health and Safety Compliance Administrator and Risk Management Department.
• Shall communicate Eastern Michigan University lockout/tagout procedures to outside contractors and receive and communicate outside contractor information to Eastern Michigan University personnel.
• Shall document all Lockout/Tagout training and periodic inspections, sending a copy to the Health and Safety Compliance Administrator.
• Shall ensure compliance with the lockout/tagout procedures including the use of disciplinary action where necessary.

EMPLOYEES

• Shall comply with lockout/tagout procedures.
• Shall consult with their supervisors or other appropriate knowledgeable management personnel whenever there are any questions regarding their safety or required job tasks.
• Shall obtain and care for the locks, tags and other devices required to comply with lockout/tagout procedures.
• Shall report any lockout/tagout job related injuries or illness and near misses to their supervisor and seek prompt medical treatment.
• Shall not operate any equipment without prior training and authorization.

HEALTH AND SAFETY COMPLIANCE ADMINISTRATOR

• Periodically conducts site visits to ensure compliance with lockout/tagout procedures throughout the University.
• Maintains documentation of lockout/tagout training and periodic inspections.
LOCKOUT/TAGOUT DEVICES

Lockout/tagout devices shall not be used for other purposes.

Locks used for lockout/tagout shall be a keyed lock*, individually identified with brass plates engraved with the employees name. Each Physical Plant shop has additional locks engraved with the shop name for locking out of devices for emergency purpose prior to making the repairs by individuals. Shop locks are removed and replaced by the individuals lock at the time of actual repair or the individuals lock may be added to the group lockout/tagout device along with the shop lock.

If the task is reassigned to another employee and the equipment must remain locked out, the employee shall remove his/her lock and a generic shop lock shall be applied until the job is reassigned. Only with instruction from the supervisor shall the shop lock be removed by another employee prior to placing his/her lockout device on the equipment.

*Master brand locks are recommended.

Group lockout devices are used for projects where more than one individual must lockout a piece of equipment.

Tags used for tagout and lockout/tagout shall be "Danger Do Not Operate" or "Danger Do Not Use" tags on which the following information shall be written: Employee Name, Department and Projected Project Completion. In the space for additional comments the date the lockout/tagout device was applied shall be provided. These tags shall be affixed to the energy isolating device using plastic tie wrap fasteners or attached to the lock. Chains, blocks, wedges, etc. for blocking and locking out specific items shall be supplied as necessary to lockout equipment. Please see specific procedures for additional information.

PROCEDURES

GENERAL RULES

Before machinery/equipment is shutdown for large scale projects, the project supervisor shall notify the zone maintenance supervisor and the building administrator(s) in the affected areas of the shutdown. When ventilation systems are being serviced in buildings with fume hoods (Briggs, Coatings Research, Mark Jefferson, Roosevelt, Sherzer and Sill), additional notification is necessary. Except for emergencies, advanced notice of the intended shutdown must be given to the building occupants.

Prior to shutting down the machine/equipment, the authorized employee shall have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled and the method or means to control the energy.

The machine/equipment shall be shut down using standard operating procedures established for the machine/equipment. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of equipment shutdown.

All energy isolating devices necessary to control the machine/equipment energy shall be physically located and operated in such a manner as to isolated the machine/equipment from the energy sources(s).
The appropriate lockout/tagout devices shall be affixed to each energy isolating device by each authorized employee working on the machine/equipment. The authorized employee shall utilize both lockout and tagout whenever possible. The lockout and tagout devices shall be attached to the energy isolation devices to meet the following requirements.

- Lockout devices shall be attached in a manner holding the energy isolating devices in the "safe" or "off" position.
- Tagout devices shall be attached in such a manner to clearly indicate the operation or movement of the energy isolating devices from the "safe" or "off" position is prohibited.
- Where tags are used in conjunction with locks, the tags shall be affixed at the same point as the lock.
- Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located in a position that would be immediately obvious to anyone attempting to operate the device.

When the machine/equipment design does not allow for affixing locks and/or tags for lockout/tagout procedures, alternative methods shall be employed to effectively isolate the energy source. For example, removing control handles to prevent operation, blocking of a control switch, etc.

**LIMITATIONS OF TAGS**

Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.

When a tag is attached to an energy isolating means, its removal shall follow release from lockout/tagout procedures.

Tags are never to be bypassed, ignored, or otherwise defeated.

Tags must be legible and understandable by all authorized employees, affected employees and all other employees whose work operations are or may be in the area, in order to be effective.

Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.

Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.

Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.
CONTROL OF STORED ENERGY

Following the application of lockout or tagout devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, and otherwise rendered safe. If there is a possibility of reaccumulation of stored energy to a hazardous level, verification of isolation shall be continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.

To render machines/equipment safe from stored and or residual energy, the following steps should be implemented as necessary:

- Inspect machinery/equipment to verify all parts have stopped moving.
- Verify the main disconnect switch or circuit breaker can't be moved to the on position.
- Use appropriate test equipment to check for residual stored energy.
- Press all start buttons and other activating controls on the equipment itself.
- Install ground wires.
- Relieve any built up pressure.
- Release the tension on springs, or block the movement of spring-driven parts.
- Block or brace parts that could fall because of gravity.
- Block parts in hydraulic and pneumatic systems that could move from loss of pressure, and bleed the lines, leaving the vent valves open.
- Drain process piping systems and close valves to prevent the flow of hazardous materials.
- If a line must be blocked where there is no valve, use a blank flange.
- Purge reactor tanks and process lines.
- Dissipate extreme cold or heat, or wear protective clothing.
- If stored energy can reaccumulate, monitor it to make sure it stays below hazardous levels.
- Shut off all machine controls when the testing is completed.

In situations where the energy isolating devices are locked/tagged out and where there is a need to test or position the equipment, the following steps shall be followed to safely remove and replace energy lockout/tagout devices.

- Clear the machine/equipment of tools and nonessential items to ensure the machine/equipment components are operationally intact.
- Ensure all employees are out of the work area and notify all employees in the immediate area of the removal of the lockout/tagout devices prior to start up of the equipment.
- Lockout/tagout devices shall be removed from each energy isolating device by the employee who applied the device. For exceptions to this rule, see release from lockout or tagout procedures.
- Energize and proceed with testing or positioning.
- Deenergize all systems and reapply energy control measures following the general rules procedures above in order to continue servicing the equipment.
RELEASE FROM LOCKOUT/TAGOUT

Before lockout/tagout devices are removed and energy is restored to the machine/equipment the authorized employee shall perform the following:

The work area shall be inspected to ensure nonessential items have been removed and the machine/equipment components are operationally intact.

Before the lockout/tagout devices are removed and before machines or equipment are energized, affected employees shall be notified that the lockout or tagout device(s) have been removed. The work areas shall be checked to ensure all affected employees have been safely positioned or removed from the work area. Zone supervisors and building administrators shall be notified of completion of large scale projects affecting a substantial area.

Each lockout or tagout device shall be removed from each energy isolating device by the employee who applied the device. EXCEPTION: When the authorized employee who applied the lockout or tagout device is not available to remove it, that device may be removed by the supervisor, using the following procedures:

- Verification by the supervisor that the authorized employee who applied the device is not at the University.
- All reasonable efforts shall be made to contact the authorized employee to inform him/her that his/her lockout or tagout device has been removed; and
- Ensure the authorized employee has this knowledge upon his/her return to work at the University.
- A Supervisors Release Form (Appendix 2) must be completed for each lockout/tagout device removed.

TAGGING DEFECTIVE EQUIPMENT VERSUS TAGOUT PROCEDURES

Tagging defective equipment out of service is not the same as tagout for servicing the equipment. Any employee can and shall tag a defective piece of machinery or equipment as defective. This tag should be an official out of service tag. However, if an official out of service tag is not available, a temporary note can be attached to the equipment until a tag is received. Tags are available from the Health and Safety Office. Defective equipment tags should include the name of the person noting the problem, the defect and the date. Defective equipment should be reported to supervisors immediately.

GROUP LOCKOUT OR TAGOUT

When servicing and/or maintenance is performed by a crew, craft, department or other group, they shall utilize a procedure which affords the employees a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.

Group lockout or tagout devices shall be used in accordance with the general lockout/tagout procedures including but not limited to the following specific requirements:

- One authorized employee shall be designed to manage a group lockout/tagout project.
- The above authorized employee shall coordinate and determine that all necessary lockout/tagout devices are properly installed.
- Each authorized employee shall affix a personal lockout or tagout device to the group lockout device, group lockbox, or comparable mechanism when he/she begins work, and shall remove those devices when he/she stops working on the machine or equipment being serviced or maintained.
SHIFT OR PERSONNEL CHANGES

Specific procedures shall be utilized during shift or personnel changes to ensure the continuity of lockout or tagout protection, including providing for the orderly transfer of lockout or tagout device protection between off-going and oncoming employees, to minimize exposure to hazards from the unexpected energization or start-up of the machine or equipment, or the release of stored energy.

If an employee is called off the job and the equipment must remain locked out, the employee shall remove his/her lock and a generic shop lock shall be applied until the job is reassigned. Only with instruction from the supervisor shall the shop lock be removed by another employee prior to placing his/her lockout/tagout device on the equipment.

OUTSIDE CONTRACTORS

Whenever outside servicing personnel will engage in activities covered by the scope and application of this standard, the on-site supervisor and the outside contractor shall inform each other of their respective lockout or tagout procedures.

The supervisor shall ensure his/her employees understand and comply with the restrictions and prohibitions of the outside contractors lockout/tagout program.

PERIODIC INSPECTIONS

Supervisors shall conduct periodic inspections of the energy control procedures at least annually to ensure the procedures and the requirements of this standard are being followed.

The periodic inspection shall be conducted to correct any deviations or inadequacies identified.

Where lockout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized employee, of that employee’s responsibilities under the energy control procedure being inspected.

Where tagout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized employee, of that employee’s responsibilities under the energy control procedure being inspected and the training requirements.

The supervisor shall certify that the periodic inspections have been performed. The certifications shall identify the machine or equipment on which the energy control procedure was being utilized, the date of the inspection, the employees included in the inspection and the person performing the inspection. See Appendix 1 for an inspection report form. A copy of the certifications shall be sent to the Health and Safety Compliance Administrator.
TRAINING

The supervisor shall provide training to ensure the purpose and function of this lockout/tagout program are understood by employees and that the knowledge and skills required for the safe application, usage and removal of the energy controls are acquired by employees. The training shall include the following:

- Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, the methods necessary for energy isolation and control, and the limitations of tags.
- All other employees whose work operations are or may be in an area where energy control procedures may be utilized, shall be instructed about the procedure, and about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.
- The Lockout/Tagout Attendance Sheet, Appendix 3, shall be used to document training.

EMPLOYEE RETRAINING

Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard or when there is a change in the lockout/tagout procedures.

Additional retraining shall also be conducted whenever a periodic inspection reveals or whenever the supervisor or Health and Safety Compliance Administrator has knowledge that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.

The retraining shall reestablish employee proficiency and introduce new or revised control methods and procedures.

SPECIFIC LOCKOUT/TAGOUT PROCEDURES

CORD AND PLUG EQUIPMENT

Machines/equipment where the only source of energy is from connection to an electrical outlet through cords and plugs shall be considered to be in compliance with lockout/tagout procedure if the following conditions are met:

- The plug is removed from the electrical source.
- The person servicing the equipment can be in control of the plug at all times during the servicing.
- All affected employees shall be notified of the equipment servicing.

An alternative means of compliance is to have a plug cap device on which lockout/tagout devices are affixed to the plug.
STEAM, WATER AND GAS LINES

For routine servicing and maintenance of steam, water and gas lines, zone maintenance supervisors and building administrators shall be notified in advance of the necessary shutdown for large scale projects affecting a substantial area. Notification shall be provided as much as possible during emergency shutdowns.

Lockout of steam, water and gas lines shall consist of turning off the main valve, chaining it in the off position and affixing the lockout and tagout devices to the chain. For systems where lockout is not possible, tagout shall be used.

Steam, water and gas lines shall not be reenergized until the work areas have been checked to ensure all employees in the immediate area have been safely positioned or removed from the work area. Means of egress shall remain accessible throughout servicing and repair.

POWERED ELECTRICAL EQUIPMENT (SAWS, LATHES, DRILL, PRESSES, ETC.)

Powered electrical equipment shall be powered off at the equipment control switch and locked and tagged out at the circuit breaker or disconnect. For hard wired equipment, the equipment shall be locked and tagged out at circuit breakers or disconnect.

KITCHEN EQUIPMENT (SLICERS, MIXERS, GARBAGE DISPOSALS, ETC.)

Cord and plug equipment shall be unplugged and tagged out of service. Hard wired equipment shall be locked and tagged out at the circuit breaker or disconnect.

LABORATORY EQUIPMENT (X-RAY MACHINES, CENTRIFUGES, ETC.)

Equipment with plug in connectors shall adhere to the cord and plug procedures for service. All other equipment shall be powered off at the equipment control switch and locked and tagged out at the circuit breaker or disconnect. All hard wired equipment shall be locked and tagged out at the circuit breaker or disconnect. Tagout of circuit breakers and disconnects is acceptable when lockout is not feasible.

HYDRAULIC LIFTS, ELEVATORS and WEIGHTED OBJECTS

Lockout/tagout shall be followed when servicing all hydraulic lifts. Whenever work requires entry under or on top of the lift, elevator or weighted objects, the lift, elevator and/or weighted objects shall be secured by blocks, locking pins and/or other suitable securing mechanisms to prevent crushing. The equipment shall be tagged out of service and locked out if possible.
ELECTRICAL ISOLATION

Live parts to which an employee may be exposed shall be deenergized before the employee works on or near them, unless the supervisor approves and can demonstrate that deenergizing introduces additional or increase hazards or is infeasible due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground need not be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

Only qualified employees may work on electric circuit parts or equipment that have not been deenergized. Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials and insulated tools.

If work is to be performed near overhead power lines, the lines shall be de-energized and grounded or other protective measures shall be provided before work is started, following these procedures:

- If the lines are to be de-energized, arrangements shall be made with the person or organization that operates or controls the electric circuits to de-energize and ground them.

- If protective measures are provided, such as guarding, isolating, or insulating, these precautions shall prevent an employee from directly contacting such lines with any part of his or her body and from indirect contact through conductive materials, tools, or equipment. The work practices used by qualified persons who install insulating devices on overhead power transmission or distribution lines are not regulated by these rules.

- Unqualified persons are prohibited from performing this type of work.

Working in confined spaces; conductive materials, equipment, articles; and use of interlocks:

When an employee works in a confined or enclosed space, such as a manhole or vault, that contains exposed energized parts, the supervisor shall provide, and the employee shall use, protective shields, protective barriers, or insulating materials as necessary to avoid inadvertent contact with these parts. Doors and hinged panels shall be secured to prevent them from swinging into an employee and causing the employee to contact exposed energized parts.

Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee must handle long dimensional conductive objects, such as ducts and pipes, in areas with exposed energized parts, the employer shall institute work practices, such as the use of isolation, guarding, and material handling techniques, which will minimize the hazard.

Portable ladders shall have non-conductive side rails if they are used where an employee or the ladder could contact exposed energized parts.

Conductive articles of jewelry and clothing, such as watchbands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread or metal headgear, shall not be worn unless rendered non-conductive by covering, wrapping, or other insulating means if they might contact exposed energized parts.
Where energized parts present an electrical contact hazard, an employee shall not perform housekeeping duties at a distance that is close enough to the parts to create the possibility of contact, unless adequate safeguards, such as insulating equipment or barriers, are provided. Electrically conductive cleaning materials, including conductive solids, such as steel wool, metalized cloth, and silicon carbide, and conductive liquid solutions, shall not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

Only a qualified person who follows the requirements of working on or near exposed parts may defeat an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system shall be returned to its operable condition when work is completed.

SWITCHGEAR, AND HIGH VOLTAGE EQUIPMENT

Only qualified personnel shall be allowed to service or maintain switchgear equipment, building electrical supply feeds and transformers.

Switches in the Heating Plant can be reset once per incident by trained Heating Plant operators. If the initial reset does not resolve the problem, Electric Shop personnel shall be contacted to isolate the problem and reset the necessary switches.

RECORDKEEPING

Supervisors shall document all lockout/tagout training and retraining. Copies shall be sent to the Health and Safety Compliance Administrator.

Supervisors shall conduct periodic inspections for compliance with lockout/tagout procedures. Inspection documentation shall be kept on the Lockout/Tagout Periodic Inspection Form, see Appendix 1.