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Document Name: Hazardous Energy Control (LOTO)      Approval Date: 9/30/09  
Document Number: 5460.8 v.4      Review Date: 4/15/15  
FMC Division: Risk Management      Approved By: AVP, FMC

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Document Name:	Hazardous Energy Control (LOTO)	Approval Date:	9/30/09
Document Number:	5460.8 v.3	Review Date:	4/18/13
FMC Division:	Risk Management	Approved By:	AVP, FMC

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## 1.0 PURPOSE

This Lockout/Tagout (LOTO) Program has been developed in accordance with the following:

- U.S. Occupational Safety and Health Administration (OSHA) regulations:
  - 29 CFR 1910.147 – The Control of Hazardous Energy (Lockout/Tagout)
  - 29 CFR 1910.333 – Selection and Use of Work Practices (Electrical Safety)

This program establishes the minimum requirements for the control of hazardous energy at Texas Woman's University (TWU) campuses and is applicable to the maintenance or service of equipment, machines or systems. This program is being implemented such that machines, equipment or systems can be isolated from potentially hazardous energy sources (electrical, compressed air, hydraulic, etc.) and locked out before workers perform service or maintenance where the unexpected start-up or release of stored energy could cause injury.

This program will apply to TWU employees and where applicable, to contractors who may be performing work on campus.

The intent of this program is to instruct TWU employees and contractors of their roles and responsibilities before, during, and following work on a piece of equipment, machinery or system requiring adherence to LOTO requirements.

## 2.0 DEFINITIONS

The following regulatory definitions (as specified in 29 CFR 1910.147) are relevant to the TWU LOTO Program:

**Affected Employee** - An employee whose job requires them to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires them to work in an area in which such servicing or maintenance is being performed. At TWU, Affected

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Employees may include faculty, students, and staff employees, their supervisors, and all Authorized Employees described below.

**Authorized Employee** - A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. Authorized Employees at TWU include properly trained employees of the Facilities Management & Construction department.

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

**Energy Isolating Device** - A mechanical device that 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 supply conductors, and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. *Push buttons, emergency stops, selector switches and other control circuit type devices are not energy isolating devices.*

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

**Lockout** - The placement of a lockout device on an energy isolating device, in accordance with an established program, ensures that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

**Lockout Device** - A device that utilizes a positive means such as a lock, either key or combination type, to 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.

**Servicing and/or Maintenance** - 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 person may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

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

### 3.0 COMPLIANCE

All TWU employees and contractors are required to comply with the restrictions and limitations imposed upon them by this program during the use of LOTO. Only “Authorized Employees” having received appropriate training may implement LOTO procedures in accordance with this program. All employees or contractors, upon observing a machine or piece of equipment which is locked out or tagged out, shall not attempt to start, energize or use that machine or piece of equipment.

Contractors must have a LOTO program in place before beginning any applicable work on site. If contractors will be conducting work on equipment for which a machine-specific procedure has not yet been developed, one must be developed by the contractor or TWU personnel.

### 4.0 EXEMPT ACTIVITIES

The following activities are exempt from the LOTO requirements (as per 29 CFR 1910.147(D)(2)(ii)):

- Minor tool changes and adjustments, and other minor servicing activities, which take place during normal production operations, provided the activities are: routine, repetitive, and integral to the use of the equipment for production, and performed using alternative measures which provide effective worker protection, and;

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- Maintenance or servicing of cord and plug connected electrical devices when the plug is under the exclusive control of the person performing the work.

If activities under the minor tool changes and adjustments exemption are to be performed, an emergency stop button should be installed after the main power source and should be located in close proximity to the equipment and properly identified if this is not already the case.

## 5.0 LOCKOUT/TAGOUT DEVICES

**TAGOUT DEVICE:** Standard OSHA-compliant plastic or laminated tags are the only tags to be used at TWU. Figure 2 shows an example of a tag meeting the requirements of 29 CFR 1910.147 (c)(5)(ii)(C)(2). **Tagout devices are not to be used without locks by TWU employees.** Alternately, a lock with a permanently affixed label containing information similar to that of the tag in Figure 2, including the name of the employee, is permissible.

**LOCKOUT DEVICE:** Only keyed locks, having one key, will be used for lockout. Each lock will be individually keyed. The individual installing the lock will maintain possession of the key at all times the lock is in use.

The above described tags and locks will be used only for the purpose of prohibiting operation of an energy isolation device under the LOTO program. The purpose of attaching them to the controlled equipment is to prevent injury to personnel. Use of LOTO devices for other purposes (i.e. to identify defective tools and out of service equipment, or to be used as information tags) is strictly prohibited.

Only one Authorized Employee may place their signature and date on a tag. For activities which include multiple authorized persons performing work on the same piece of machinery or equipment, a tag and lock must be attached to a locked out valve, switch, or device **by each person performing work** to properly protect TWU employees or contractors involved.

Operating or attempting to operate equipment or systems while under LOTO, is prohibited under any circumstances until tags and locks have been removed. TWU employees and contractors removing locks

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and tags are responsible for the satisfactory completion of the work performed. This is to include re-installation of guards, as appropriate, and verifying that all persons affected or potentially affected by the startup or energization are informed and warned.

## 6.0 MACHINE SPECIFIC LOCKOUT/TAGOUT PROCEDURE DEVELOPMENT

If a machine-specific LOTO procedure has not already been established for a machine, equipment or system that work is to be performed on, the Authorized Employee or contractor performing the work will determine if the equipment is subject to LOTO with the assistance of Risk Management or other TWU personnel knowledgeable about the equipment.

A machine-specific LOTO procedure will be developed for any machine, equipment or system for which the unexpected start-up or release of stored energy could cause injury. The following are the only exceptions to this requirement:

- Equipment/systems covered by one of the LOTO exemptions listed in Section 4.0, OR
- Equipment/systems for which the hazardous energy consists of a single source of electricity, and there is no potential for stored energy (such work must still be conducted under LOTO, but a machine-specific procedure is not required to be developed).

If a contractor will be developing the procedure, TWU personnel with knowledge of the equipment/system must provide information regarding the type and magnitude of the energy that the equipment utilizes, the hazards of the energy, and the methods to control the energy.

The machine-specific LOTO procedure must identify the energy sources and magnitude, lockout point locations, required equipment, lockout sequence, and verification method. The LOTO procedure must be documented either on the Machine Specific Lockout/Tagout Procedure form (Figure 1), or in another format that contains the required information.

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**Note:** Machine-specific procedures shall **not** specify that push buttons, emergency stops, selector switches and other control circuit type devices are to be locked out as an energy isolation method.

## 7.0 LOCKOUT/TAGOUT PROCEDURES

The following steps are to be performed by Authorized Employees and contractors who will be performing work on equipment, machines or systems requiring use of LOTO procedures:

**Step 1:** If a machine-specific LOTO procedure has not been developed for the equipment, machine or system, the procedure in the previous section shall be followed in order to determine if the equipment is covered by LOTO requirements, and to develop a procedure if necessary.

**Step 2:** Before the energy isolation procedure is begun, all Affected Employees must be notified of the application of LOTO devices.

**Authorized Employees:** The Authorized Employee(s) conducting work under LOTO will be responsible for notifying all Affected Employees that the energized equipment will be shut off and locked and tagged out to perform necessary maintenance or service work.

**Contractors:** Contractors will gain approval from the responsible, and appropriately trained, TWU employee before performing work on equipment requiring use of LOTO procedures. The TWU employee will be responsible for notifying all Affected Employees that the energized system or equipment will be shut off and locked and tagged out to perform necessary maintenance or service work. As an optional additional safeguard, the TWU employee may also place his lock and tag on the equipment as well, and leave it in place until the work is complete. This allows the TWU employee to have control over when the equipment is re-energized and allow for the notification of Affected Employees prior to doing so.

**Step 3:** Follow the machine-specific LOTO procedure developed for the equipment. For electrical equipment for which a written procedure is not required (see Section 6.0 above), lock out the

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appropriate energy isolation device. Isolate or deactivate the system such that all stored energy has been dissipated or restricted by methods such as grounding, repositioning, blocking, bleeding-off, etc.

**Step 4:** Place the LOTO tags, along with any necessary locking devices and individual locks on all energy isolation devices. Each person working on a particular piece of equipment **must** place their own tags and locks on each energy isolation device.

**Step 5: IMPORTANT:** Verify that the equipment has been isolated from the energy source by attempting to start the system as per the machine-specific procedure.

**IN ADDITION:** If TWU employees or contractors will be exposed to circuit elements and electrical parts of equipment, a qualified electrician shall use test equipment to verify that the circuit elements and equipment parts are deenergized. The test shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage backfeed even though specific parts of the circuit have been deenergized and presumed to be safe. The test equipment shall be checked for proper operation immediately before and after this test on with a known working power source.

**This testing must be conducted in accordance with the TWU Electrical Safety Program – i.e. shock and arc flash protective equipment appropriate to the hazard must be worn until the testing verifies that the circuit elements are de-energized.**

**Step 6: IMPORTANT:** Return operating controls to neutral or off position after verifying the isolation of the equipment or system.

## 8.0 REMOVAL OF LOCKOUT/TAGOUT DEVICES

LOTO devices must remain in place until the work performed under the LOTO requirements is complete. If the work is not complete at the end of a shift, and another shift will be continuing the work, the locks and tags of the new shift must be put in place at the same time as the current shift's locks and tags are



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removed. **Only the person who placed a lock and tag may remove it.** All tags and locks from the current shift must be removed before the next shift can place theirs. If only one shift shall be working on the covered equipment, at least one lock or tag must remain in place until the work is complete.

When the work performed under the LOTO requirements is complete, and the equipment is ready to return to normal operating condition, the area around the equipment must be inspected to ensure nonessential items have been removed and that the equipment components are operationally intact. The area must be checked to ensure that workers have been safely positioned or removed from the area. When a contractor completes work, he will remove all of his locks and tags and then notify the TWU employee responsible for the contractor, who will notify the Affected Employees. The TWU employee will then remove his lock and tag if he placed it under the optional procedure listed in Step 5 above (See Section 7.0).

If it becomes necessary to remove the lock and tag of another Authorized Employee, the Director of Physical Plant (or for the Houston or Dallas campuses, the appropriate Manager of Facility Operations) or the Director of Environmental, Safety & Health must be notified prior to doing so. **Only these employees may authorize removal of another Authorized Employee's lock and/or tag.** The supervisor of the employee whose lock and tag are to be removed **must do the following:**

- Verify that the Authorized Employee who placed the lock and/or tag is **not** at the facility,
- Make **all reasonable efforts** to contact the Authorized Employee to inform him that his lock and tag have been removed, AND
- Ensure that the Authorized Employee has this knowledge **before he resumes work** on campus.

## 9.0 UNAUTHORIZED REMOVAL OF LOCKOUT/TAGOUT DEVICES

TWU employees who attempt to operate an energy isolating device to which LOTO locks and tags are attached, or remove locks or tags which are not their own, will be subject to disciplinary action. Contractors will face ejection from TWU facilities

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## 10.0 TRAINING

Both Authorized and Affected Employees will receive training in accordance with 29 CFR 1910.147(c)(7).

- Authorized Employee training will include the recognition of hazardous energy sources, the types and magnitude of the energy sources present, and the methods and procedures necessary for LOTO.
- All Affected Employees, whose work operations are or may be in an area where LOTO procedures may be used, shall be informed of these procedures.
- All contractors' employees who are required to perform any LOTO procedures in the course of their assigned tasks shall be thoroughly and adequately trained by their employers.

Retraining of TWU employees shall take place whenever job assignments, machines, processes, equipment, or procedures change, when new hazards arise, or when periodic inspections reveal program discrepancies (see Section 11.0 below). Documentation of employee training shall be maintained by the Office of Risk Management.

## 11.0 PERIODIC INSPECTION OF LOTO PROGRAMS

TWU will conduct periodic inspections of this LOTO program at least annually to ensure that site personnel and contractors are following this program and the requirements of the applicable regulatory standards. The periodic inspection will be conducted to identify and correct any deviations or inadequacies either in the written documentation (this program or the machine-specific LOTO procedures), or in employee compliance with the documentation. When discrepancies are found, procedures will be reviewed in all departments to determine how extensive retraining efforts must be.

In order to complete the periodic inspection, machine-specific LOTO procedures that have been developed for use by Authorized Employees must be reviewed. However, all existing machine-specific LOTO procedures need not be reviewed. A sampling approach which is representative of all existing

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machine-specific LOTO procedures may be employed. For each procedure reviewed, an Authorized Employee shall act as the “inspector” while other Authorized Employees perform the work under the procedure. The inspector will observe the work in order to determine if the procedure is adequate, and if the Authorized Employees are following it. The inspector will also review the results of the inspection with ALL TWU Authorized Employees, including those who were not present at the time of the inspection. The inspector will complete a Periodic Inspection Record (Figure 3) for each procedure observed. The Periodic Inspection Records will be maintained by the Office of Risk Management.

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*Work place safety is in everyone’s best interest. Any violations of this program or any other programs or standards should be reported immediately to your supervisor or the TWU Office of Risk Management.*

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## FIGURES

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Document Number: 5460.8 v.4

Review Date: 4/15/15

FMC Division: Risk Management

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**Figure 1**

**Machine Specific Lockout/Tagout Procedure Form**

<b>ID #: 1-322</b>	<b>Name: Some Random Equipment</b>	<b>Location: Wherever</b>	<b>Rev. Date: 8/14/09</b>
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**PURPOSE:**

This procedure establishes the minimum requirement for the lockout of energy isolating devices whenever maintenance or servicing is performed on this equipment or machine. It shall be used to ensure that the equipment or machine is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance when the unexpected energization or start-up of the machine or equipment or release of stored energy could cause injury.

**COMPLIANCE:**

- ❑ **All employees** are required to comply with the restrictions and limitations imposed upon them during the use of lockout. The **authorized employees** are required to perform the lockout in accordance with this procedure.
- ❑ **All employees**, upon observing a machine or piece of equipment which is locked out to perform servicing or maintenance **shall NOT attempt to start, energize, or use that machine or equipment.**

**LOCKOUT SEQUENCE:**

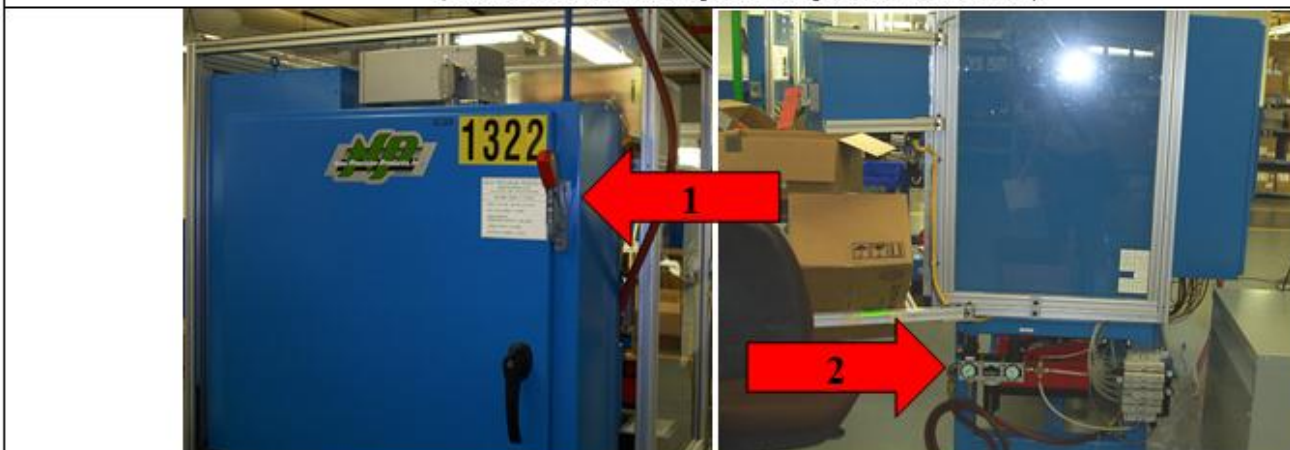
- 1) Notify all affected employees that the equipment/machine requires servicing or maintenance and that the equipment/machine must be shut down and locked out before the servicing or maintenance can begin.
- 2) If the equipment or machine is operating, shut it down by its normal stopping procedure.

**NORMAL STOPPING PROCEDURE: Depress plunger labeled "Power Start/Stop".**

- 3) Deactivate the energy isolating device(s) to isolate energy source(s) from the equipment or machine, refer to chart and picture below.
- 4) Lock out the energy isolating device(s) with assigned individual lock(s).
- 5) Stored or residual energy must be relieved, dissipated, or restrained by appropriate methods listed in chart below.
- 6) Ensure that the equipment/machine is disconnected from the energy source(s) by first, checking that no personnel are exposed, then verify the isolation of the equipment/machine by the method listed below. **Note:** If employees will be working with circuit elements or electrical parts (such as wiring or electrical enclosures), a qualified electrician must use test equipment to verify that the circuit elements and equipment parts are deenergized. **CAUTION:** Return operating control(s) to the neutral or "off" position after verifying.

Sequence	Hazardous Energy Source	Lockout Location/Method	Verification Method
1	230V Electricity	Move electric disconnect switch on junction box to "off" and lock.	Pull up plunger labeled "Power Start/Stop" and touch cycle start buttons.
2	90 psi Compressed Air	Slide air disconnect to "off" and lock.	

**ENERGY ISOLATION DEVICE LOCATION(S)**  
(Numbered arrows correspond to sequence number above)



**SEQUENCE FOR RESTORING EQUIPMENT OR MACHINE TO SERVICE:**

- 1) Check the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.
- 2) Check the surrounding work area to ensure that all employees have been safely positioned or removed from the area.
- 3) Verify that the controls are in the neutral or "off" position.
- 4) Notify all affected employees that the servicing or maintenance is completed and the equipment or machine is ready for operation.
- 5) Remove the lockout devices.
- 6) Reenergize the equipment or machine by reversing the procedure for each energy source listed in the chart above.

Figure 2

EXAMPLE LOCKOUT/TAGOUT TAG



**Document Name:** Lockout/Tagout Periodic Inspection Form  
**Document Number:** 5460.8.F2 v.2  
**FMC Division:** Risk Management

**Approval Date:** 9/30/09  
**Review Date:** 5/31/13  
**Approved By:** AVP, FMC

<b>Inspector:</b>		<b>Inspection Date:</b>	
<b>Equipment Inspected:</b>			
<b>Names of Authorized TWU Employees Conducting LOTO Procedure:</b>			
<b>Deficiencies/Inadequacies Noted:</b>			
<b>Authorized TWU Employees Inspection Results Were Reviewed With (Copy if Necessary):</b>			
<b>Name</b>	<b>Date</b>	<b>Name</b>	<b>Date</b>



