1. Purpose

This program established Kennesaw State University's (KSU's) requirements for the control of hazardous energy associated with machines, equipment, and processes. The purpose of the program is to eliminate or minimize the risk of exposure to hazardous energy when employees perform activities where unexpected release of hazardous energy could occur and cause injury. Unexpected release of energy includes unintended motion, energization, start up, or release of stored energy, whether deliberate or otherwise.

The program ensures that machines, equipment, or processes are stopped, isolated from all potential hazardous energy sources, and properly locked or tagged out.

The control of hazardous energy is intended to:

- Achieve and maintain a safe work condition while serving and performing maintenance.
- Protect employees and contractors from the sudden release of unexpected energy and the unplanned startup of equipment or machinery.
- Prevent equipment damage through planned shut-down and energy isolation procedures.
- Prevent the possibility of an unplanned release of any environment unfriendly substances.

2. Scope

The Occupational Safety and Health Administration's (OSHA's) Control of Hazardous Energy (Lockout/Tagout) standard covers working on or around equipment where employees may be exposed to the unexpected energization, motion or start-up of machines or equipment. This program details the minimum performance requirements and has provisions for employee training, group lockout/tagout, inspection certifications, protective materials & hardware, application & test of controls, and procedures for shift or personnel changes. The standard does not apply to cord and plug connected electrical equipment where the plug is under the control of the servicing mechanic, or hot tap (welding) operations

This standard applies to all locations and activities where personnel could be exposed to hazardous energy. It covers the servicing and maintenance of machines and other equipment and processes. The standard does not apply only to cord and plug connected electrical equipment where the plug is under the control of the servicing mechanic, or hot tap (welding) operations. Standalone equipment like generators and automobiles have lockout restrictions that apply.

The program covers all faculty, staff, students, contractors, and other personnel at KSU, or those under the management or control of KSU.

3. 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 an area in which such servicing or maintenance is being performed.

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. 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 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 all ungrounded 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, 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.

Hot tap – A procedure used in the repair, maintenance and services activities which involves welding on a piece of equipment (pipelines, vessels or tanks) under pressure, in order to install connections or appurtenances. it is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

Lockout – The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring 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 the safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

Normal production operations – The utilization of a machine or equipment to perform its intended production function.

Servicing and 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 employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

Setting up – Any work performed to prepare a machine or equipment to perform its normal production operation.

Tagout – The placement of a tagout device on an energy isolating device, in accordance with an established procedure, 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 procedure, to indicate

that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

4. Roles and Responsibilities

A. Environmental Health and Safety

The Environmental Health and Safety (EHS) Department is responsible for periodic evaluations of work being performed as well as determining whether work is being performed in compliance with this program. They are also responsible for:

- Providing or assisting with practical training on this program.
- Conducting an annual review of this program and reviewing and updating it as necessary.
- Assisting work units in the implementation of this program.

B. University Departments and Divisions

University departments and divisions are responsible for implementing this policy. They must develop and maintain their own proper procedures, physical training, equipment purchases. They are also responsible for providing modifications to machines and systems, where necessary.

C. Supervisors

Supervisors have the following responsibilities under KSU's lockout/tagout (LOTO) program:

- Evaluate the potential hazards of specific equipment.
- Establish a written program.
- Establish written LOTO procedures for each individual or group of similar machines in place.
- Communicate with contractors regarding the company's LOTO program and exposures.
- Train employees (authorized, affected, and other).
- Verify lock and tag application process.
- Account for new equipment and processes.
- Establish group lockout process as needed.
- Perform annual and periodic inspections, as required.
- Account for shift and personnel changes, as needed or required.

5. Training

Training will be provided to ensure that the purpose and function of the energy control 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. Training is required under the following circumstances:

- Upon initial assignment.
- When changes in job responsibilities occur.
- When new equipment is brought into an area.
- When new processes that present new hazards are introduced.
- When there are change sin the hazardous energy control procedures.
- When deficiencies or deviations from established procedures are noted.
- When an inspection or review reveals deficiencies.

When tagout only systems are used, all employees will be trained on the limitations of tags, including:

- Tags are warning devices only and do not provide physical restraint
- Tags may not be removed, except by the person who applied it.

- Tags must be legible and understandable by all employees
- Tags must stand up to the conditions where they are applied (wet, cold, heat, etc.)
- Tags must be secure, so they do not inadvertently fall off or get removed
- Tags may evoke a "false sense of security" and must not be used as a sole system when locks or other devices can be applied

Training will be provided to authorized, affected, and other employees based on their exposure hazardous energy. All levels of training should include information on who serves as the responsible person designated for the loc removal for absent employee process.

D. Authorized Employees

Authorized employees will receive formal LOTO training. The training should also be supplemented by localized application, procedure, or equipment-specific instruction, which includes written procedures and hands-on instruction of LOTO application.

The training should enable the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.

E. Affected Employees

Affected employees will receive a mid-range level of training to inform them of the purpose of the program and their limitations and responsibilities under the program.

F. Other Employees

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.

G. Retraining

Retraining is required for both authorized and affected employees when:

- Employee lockouts are performed incorrectly, reviews reveal deficiencies, or when there is reason to believe there are inadequacies in the employee's knowledge of the energy control procedures.
- There is a change in job assignment.
- Modifications to equipment occur which affects the LOTO procedure or present a new hazard.
- A procedure has been changed since the last time the employee performed LOTO on that equipment or machinery.

H. Recordkeeping

Training records will be maintained. Training records include the name of the employee trained and the date of training.

6. Program

This document serves as the written LOTO program for KSU. Before performing service or maintenance on equipment or machinery where energy or motion could release and cause injury, the energy sources must be isolated and locked out.

Up to date written procedures are in place and followed for the isolation of an energy source (including locking, blocking, and tagging). Procedures must be written for both routine and non-routine service and

maintenance work, and including production work such as set-up, cleaning, and un-jamming. These procedures must include sufficient detail to provide each employee with control over all hazardous energy they may be exposed to (such as electrical, mechanical, gravitational, hydraulic, pneumatic, chemical, thermal, or other hazards).

7. Procedures

A. Device Requirements

Each department must provide their own LOTO isolating devices to include the following:

- Locks
- Tags
- Wedges
- Adapter pins
- Other hardware used for isolating, securing, or blocking machines and equipment from energy sources

LOTO devices should be standardized and should be the only acceptable method of isolating energy sources. Locks and tags should never be used for other purposes.

B. Application

Machinery must be able to be locked out or made lockable when they are:

- Replaced or undergo major repairs
- Renovated or modified
- Purchased and installed

New equipment installations must be capable of being locked out as an integral part of the machine (without the use of chains.)

1. The Six Steps of Lockout/Tagout

OSHA recommends LOTO be performed according to a six-step procedure:

1. Prepare for shutdown by getting permission to work on equipment. Gather all written LOTO procedures. Identify the location of energy isolation devices. Get all equipment needed, including all locks, tags, chains, and fixtures. Get information on the type and amount of the energy you are working with.
2. Shut down equipment using normal controls after notifying affected employees in the area.
3. Isolate the equipment by turning all energy isolation devices to the "OFF" or closed position.
4. Apply LOTO devices by having the authorized worker put a lock, tag, or both on each energy isolation device. Fixtures may be required to hold the energy isolating device in the "OFF" position or to connect multiple locks. Test each energy isolation device. Place tags in the same place as a lock if a lock is used.
5. Release all stored energy and set up the machine or equipment so that it cannot collect energy. Check the machine or equipment periodically to make sure stored energy is not collecting.
6. Confirm equipment isolation by trying to start up the machine or equipment using normal operating controls. Equipment is not isolated if it starts up or if the lights come on. Confirm isolation using tools like a voltmeter. Do not use tools to confirm isolation if you are not trained and authorized.

2. Tags without Locks

Tags will always accompany LOTO specific locks, except for the following situations:

- If locks cannot be used, tags must be supplemented by other means to ensure an equivalent level of safety to that of a lock application (i.e., removing a control switch, circuit breaker or valve handle).
- Where locks are not used, the supplemental means (and its written procedure) must be reviewed with each authorized and affected employee at least annually.
- When equipment is being taken out of service (i.e., abandoned in place or no longer used), non-LOTO locks and tags will be used. The tag will contain the words, "Out of Service," and an appropriate description.

3. Tag Application

Tags much be attached to locks with nylon cable ties or a material equivalent in strength. Tags must contain the following information:

- Name of equipment being secured.
- Name of person securing.
- Date of application (securing).
- How to contact person securing.
- Reason for being secured (ex., taken out of service, repair, etc.)
- A statement prohibiting removal or tampering with the lock or tag.

Tags must include a statement such as, “Do not start,” “Do not open,” Do not close,” “Do not energize,” or “Do not operate.”

4. Other Energy Control Devices

Blocks, chains, wedges, adapter pins, and self-locking fasteners may be used to block machines or equipment from unexpected energization (i.e., a block may be used to wedge open a mechanical power press during tool changes to prevent the machine from cycling).

Automotive repair personnel should consult with the vehicle service guidelines to determine if removal of the ignition key is sufficient to ensure energy hazards are controlled, or if batteries must be disconnected during diagnostic or repair activities.

Generators and similar standalone equipment must have the energy sources controlled through disconnect of the spark plug or lock out of the controls for the engine.

5. Group Lockout

Group lockouts will incorporate the use of a group lockout device. Devices may include a lockable container (like a strong box) to hold the process lock keys and tagout records for large jobs and long duration work, or a multiple lock adapter for single machines that require more than one lock. These group devices are used as controls where there are complex situations involving many different people who all require the machine or process to be locked before they work on it.

One primary authorized person will be assigned and will be responsible for all locks on the project and assuring the continuity of energy control for the entire group. This person is solely responsible for applying and removing the master locking device that provide protection from the main energy source.

Each authorized employee involved in the group lockout must affix a personal lockout or tagout device to the machine, equipment, or into group lockbox or onto the device when their work begins and remove it when their work is completed.

6. Shift/Employee Change

Specific procedures to account for shift or employee changes must ensure the continuity of LOTO protection and must include a provision for the transfer of devices. This will minimize exposure to hazards from the unexpected energization or start-up of the machine or equipment or the release of stored energy.

7. Contractors

Contractors must be advised that KSU has and enforces the use of LOTO procedures. They will be informed of the use of locks and tags and notified about the prohibition of attempts to restart or re-energize machines or equipment that are locked out or tagged out. KSU project managers will obtain information from the contractor about their LOTO procedures and advise affected employees of this information.

8. Alternative Methods

When LOTO is not used for tasks that are routine, repetitive, and integral to the production process, or prohibits the completion of those tasks, then an alternative method must be used to control hazardous energy. Selection of an alternative control method must be based on a risk assessment of the machine, equipment, or process. The risk assessment must consider existing safeguards provided with the machine, equipment or process that may need to be removed or modified to perform a given task. Under all circumstances, the individual must have exclusive personal control over the means to maintain the state of the control circuit in a protective mode.

C. Removal

Check the work area to ensure that tools and other non-essential items have been removed and that the machine or equipment components are intact. Ensure employees have been safely moved away from the work area.

Verify that the machine controls are in neutral or off, then remove the LOTO device(s) and reenergize the machine or equipment. Note that the removal of some forms of blocking may require reenergizing of the machine before safe removal.

Notify area employees that the servicing or maintenance work is completed, and the machine is ready for use.

1. Absentee Employee Process

Each LOTO device must be removed from the energy isolating device by the employee who applied the device. When the authorized employee who applied the device is not available to remove it, the device may be removed under the direction of a single designated person at the company provided this designated person follows specific procedures:

- Verification that the authorized employee who applied the device is not at the facility.
- Efforts are made to contact the authorized employee to inform them that their LOTO device has been removed.
- There are methods followed to ensure the authorized employee knows their device was removed before they resume work.

8. Inspections

Inspect LOTO procedures and actual lockouts (at least annually) to assure they meet regulatory requirements. The inspection is led by a LOTO authorized employee who has been trained in that

procedure. This person must be someone other than the one performing the lockout. The inspections requirements include:

- Checking training records to verify people have been trained to the level necessary.
- Reviewing the procedure document within the last calendar year to ensure procedures are adequate, understandable, and are being followed.
- Having all employees authorized to use that procedure participate in reviewing the procedure (group meeting reviews are acceptable).
- Field checking the actual lock-out to assure the equipment is being locked out properly. The inspector and the person locking the equipment are required to participate, at a minimum.
- Asking operators how they would lock/tag equipment and verify by demonstration.
- Nothing and correcting deficiencies.

Inspections should be documented using the inspection certificate form provided with this program, or an equivalent record. Both the inspector and the person performing the LOTO must sign the assessment certificate.

If the procedure is found lacking or deficient, it must be revised and all employees who would use that procedure must be retrained to the new procedure before servicing or maintaining that equipment.

Each procedure that is used for normal or routine lockouts must be reviewed at least once per year. Non-routine lockouts must have a procedure reviewed before the procedure is used, if it has not been used in the last calendar year.

9. Safety Information

When working with machines and equipment with greater than or equal to 50 volts to ground, only an electrical qualified person can:

- Operate the equipment
- Verify that the equipment cannot be restarted.
- Use test equipment to test the circuit elements and electrical parts of the equipment, including exposure to back-feed or inadvertently induced voltage.
- Conduct tests and inspections to verify they equipment can be safely re-energized.

Safe de-energizing and re-energizing procedures must be determined before service or maintenance is performed and approved in writing by an electrical qualified person before LOTO is performed.

Appendix A: Lockout/Tagout Absent Employee Lock Removal Procedure

KENNESAW STATE UNIVERSITY FACILITIES SERVICES *Environmental Health and Safety*	**Lockout/Tagout Absent Employee Lock Removal Procedure**
EOSMS- 303-1	*Effective Date: 06/01/2022*	*FORM_EHS_01*	*Page 1 of 2*

Instructions
If present, the Absent Person's supervisor must physically witness the lock removal and must retain possession of the lock(s). Before the Absent Person returns to any work duty, the Absent Person's supervisor must ensure that the person is presented with the removed lock and is informed of the reasons for the removal. The completed absent Authorized Person LOTO Lock Removal Form must be returned to EHS at firesafety@kennesaw.edu.
Designated Person
_____ is the single, designated person to contact when a lock or other device requires removal by someone other than the authorized employee who applied the device.
List the steps taken to verify the absent employee is not at the facility.
List the steps taken to contact the absent employee (if different from above).
List the steps taken to ensure the absent employee knows their device has been removed (if different from above):

Diagram or photos of unit.	Schematic/Blueprint Attached? ☐ Yes ☐ No

Written Procedures Author:	To be Developed by (date):	To be Implemented by (date):

Remarks

Authorization

☐ Approved

I acknowledge that I have conducted a Lockout Tagout Assessment of the equipment or machine namedabove and have detailed the findings of the assessment on this form.

* Further detailed on attachment: ☐ Yes ☐ No

Name	Signature
Title	Date

Assessment Form Retention Information		Attachments	
Permanent Retention File: EHS Department	Location: EHS Team Application	Yes	No
Date Filed	Filed By	*See following pages	

Appendix B: Lockout/Tagout Determination of Applicability

KENNESAW STATE UNIVERSITY
FACILITIES SERVICES
Environmental Health and Safety

Lockout/Tagout Determination of Applicability

EOSMS- 303-2 | *Effective Date: 06/01/2022* | *FORM_EHS_01* | *Page 1 of 1*

Instructions

Please complete the form to ensure the specific requirements for testing a machine or equipment are met and to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

Equipment Designation	Location

Date Assessed	Related Operating Procedures Reviewed ☐ Yes ☐ No	Related Maintenance Procedures Reviewed ☐ Yes ☐ No

Lockout/Tagout Assessment Checklist

Is there a potential for stored, residual, or accumulation of energy after shutdown?	☐ Yes*	☐ No
Does the unit have multiple energy sources that cannot be readily identified and isolated?	☐ Yes*	☐ No
The isolation and lock out of energy sources will not completely deenergize or deactivate the unit.	☐ Yes*	☐ No
The unit is isolated from its energy source and locked out during servicing or maintenance.	☐ Yes*	☐ No
A single lockout device will achieve a locked-out condition.	☐ Yes*	☐ No
The lockout device is under the exclusive control of an "**Authorized Employee.**"	☐ Yes*	☐ No
The servicing or maintenance creates hazards for other employees.	☐ Yes*	☐ No
Have accidents involving unexpected activation/reenergization occurred during servicing?	☐ Yes*	☐ No

*Written procedures must be developed if any "Yes" answers have been given.

Assessed Energy Sources (indicate specific sources with initials)

Initials	Energy Source	Magnitude of Unit of Measure	Method to Dissipate or Restrain
	Chemical		
	Hydraulic		
	Pneumatic		
	Mechanical		
	Electrical		
	Thermal		
	Radioactive		
	Kinetic		
	Other		

Types and Locations of Operating Controls

*Further detailed on attachment ☐ Yes ☐ No

Types of Operating Controls	Location on Unit

Types and Locations of Energy Isolating Devices

*Further detailed on attachment ☐ Yes ☐ No

Types of Energy Isolating Devices	Location(s)

Methods to Verify Isolation of the Unit

*Further detailed on attachment ☐ Yes ☐ No

Method	Verification

EOSMS 303-2: Lockout/Tagout Determination of Applicability Page 1

Appendix C: Lockout/Tagout Equipment List

KENNESAW STATE UNIVERSITY FACILITIES SERVICES *Environmental Health and Safety*	**Lockout/Tagout Equipment List**
EOSMS- 303-3	*Effective Date: 06/01/2022*	*FORM_EHS_01*	*Page 1 of 1*

Instructions

List the type of equipment and stock number below for each piece of equipment used during the LOTO process.

Lockout/Tagout Equipment Requirements

LOTO equipment must be:

- Used for LOTO only.
- Identified (either through marking and labeling or training) as LOTO devices.
- Durable and capable of withstanding the environment and pressures applied to them.
- Standardized (same color, unique shape, same size/type of print, etc.).
- Substantial in that locks may not be easily removable (without the use of tools or excessive force) and that tags must not be accidentally removed or fall off.
- Identifiable to the person who applied them, either by name or number system.

The locks, tags, and other devices specified below are the only authorized LOTO devices to be used at the company and must not be used for locking equipment other than for LOTO and energy control purposes.

LOTO Equipment	Stock Number
Ball valve lockout	
Beaker lockout	
Electrical plug lockout	
Gate valve lockout	
Hasp	
Nylon hasp	
Padlock	
Tag	

EOSMS 303-3: Lockout/Tagout Equipment List Page 1

Appendix D: Lockout/Tagout Written Procedure Inspection Certificate

KENNESAW STATE UNIVERSITY FACILITIES SERVICES *Environmental Health and Safety*	**Lockout/Tagout Written Procedure Inspection Certificate**
EOSMS- 303-5	*Effective Date: 06/01/2022*	*FORM_EHS_01*	*Page 1 of 1*

Instructions	
This form is to be used for tracking purposes and as a field check to ensure everything is in order before conducting LOTO.	
Department Name:	
Internal Procedure Number (if applicable):	**Last Updated:**
Machinery or Equipment Name or Type:	
Employees Trained as "Authorized" for this Procedure	

Elements of Inspection

- **Preparation for shutdown** – Knowledge of the type and magnitude of the hazardous energy.
- **Machine or equipment shutdown** – Performed using established procedure.
- **Machine or equipment isolation** – All energy sources located and isolated.
- **Hazardous energy control device application** – Affixed to the energy isolation device by authorized individuals.
- **Stored energy** – All potentially hazardous stored or residual energy must be relieved, disconnected, restrained, and otherwise rendered safe.
- **Verification of isolation** – Authorized employee will verify the isolation and de-energizing of the machine or equipment has been accomplished.

Verification A field-check of the utilization of this procedure was performed on the following "Authorized" individuals.	

Authorization Field check was performed by the following authorized employee and not the person being field checked.	
Name	**Date**

Deficiencies Noted During Field Check

Verification Statement	
The inspected individuals demonstrated adequate knowledge of locking/tagging this piece of equipment. Any deficiencies noted above have been corrected and proper techniques have been verified.	
Signature of Field-Check Inspector:	**Signature of Lockout/Tagout Employee:**

Appendix E: Lockout/Tagout Written Procedure Acknowledgement

KENNESAW STATE UNIVERSITY FACILITIES SERVICES *Environmental Health and Safety*	**Lockout/Tagout Written Procedure Acknowledgement**

EOSMS- 303-4	*Effective Date: 06/01/2022*	*FORM_EHS_01*	*Page 1 of 1*

Instructions

This form is to be completed annually to ensure the procedure each piece of equipment that may possibly be locked and or tagged out has been reviewed and updated.

Name of Machine or Procedure	Original Procedure Date	Annual Review Date	Authorized Employee Signature