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1.0 Applicability

This program applies to all SMU faculty, staff and service providers who work under contract for SMU at all facilities owned and/or operated by SMU.

2.0 Scope

This program provides instruction to prevent injuries due to the release of hazardous energy when performing maintenance activities and to comply with regulations and SMU EHS Programs.

The program applies to all forms of energy, including electrical, steam, pneumatic, hydraulic, mechanical, thermal, chemical, pressure and gravity.

This program does not apply to the following:

- Hot Tap operations involving transmission and distribution systems for substances such as gas, steam, water, or petroleum products when they are performed on pressurized pipelines, provided that:
    - Continuity of service is essential.
    - Shutdown of the system is impractical.
    - Documented procedures are followed and special equipment is used which will provide proven effective protection for employees.
    - Documented procedures are provided and approved by the Office of Risk Management.

- Operations where the controlled release of potentially hazardous energy sources is intended (e.g., sandblasting, system blow down).
- Cord-and-plug-connected machines and/or equipment if unplugged; the plug is under the exclusive control of the operator, and the electricity is the only form of hazardous energy.
- Normal operations unless:
    - An employee must remove or bypass a guard or other safety device.
    - An employee must place any part of his or her body into an area on a machine or piece of equipment where work is performed upon the material being processed (point of operation) or where an associated danger zone exists during a machine operating cycle.

This program conforms to SMU's policies and EHS Management System standards and guidance documents; and complies with regulatory requirements.

3.0 Definitions

The following terms are defined in order to allow a better understanding of this program:

- **Affected employee:** An employee who is responsible for the operation of equipment on which servicing is being completed under LOTO conditions.
- **Authorized employee:** An employee approved to lock and tag out equipment in order to complete servicing on that equipment. An "authorized employee" and an "affected employee" may be the same person when the affected employee's duties include equipment maintenance or repair.
- **Capable of being locked out:** An energy isolation device is capable of being locked out if (1) it is designed with a hasp or other means of attachment to which a lock can be affixed; or (2) it has a locking mechanism built into it.
- **Competent person:** one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

- **Energized:** Connected to an energy source or containing residual or stored energy.
- **Energy isolation device:** A mechanical device that physically prevents transmission of energy. Examples of energy isolation devices would include the following: a manually operated circuit breaker; an electrical disconnect switch; a line valve; and similar devices used to block or isolate energy. (**Note:** Push buttons, selector switches, and other control-circuit devices are not energy isolation devices).
- **Energy source:** Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.
- **Lockout:** The placement of a lockout device on an energy isolating device which ensures that the energy isolation device and the equipment being controlled cannot be operated until the lockout device is removed.
- **Lockout device:** A device that utilizes a lock and key to hold an energy isolation device in the "SAFE" or "OFF" position and prevents machinery or equipment from becoming energized.
- **LOTO:** An acronym for "Lockout / Tagout", devices and processes used to control hazardous energy.
- **Other employee:** An employee who is not directly responsible for the operation of equipment which is being serviced under LOTO conditions, but who is present in the immediate area of the servicing.
- **Maintenance-Servicing or service work:** Workplace activities such as constructing, installing, setting up, adjusting, inspecting, servicing, modifying, and maintaining machines or equipment.
- **Tagout:** The placement of a tagout device on an energy isolation device to indicate that the energy isolation 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 attached to equipment for the purpose of alerting personnel not to operate an energy isolation device. Tagout devices are used to identify the authorized employee responsible for the servicing and the date of application.

4.0 Core Information and Requirements

4.1 Lockout vs. Tagout Concept:

4.1.1 LockOut

During the servicing of equipment, each energy isolation device that is "capable of being locked out" will have both a lock and a tag attached to it. Lockout in combination with tagout is the required method of energy isolation at SMU.

4.1.2 Tagout

If an energy isolation device will not accept a lock, this is a "tagout" situation and tags alone should be securely attached to each isolation point. Tags are to be treated with the same respect as locks. They may never be bypassed or ignored and may only be removed by the employee who applied them.

4.2 Lockout/Tagout Supplies:

4.2.1 Locks

Work units are responsible for ensuring that an adequate supply of locks is available to authorized employees. All locks shall be individually marked and keyed. If duplicate keys exist for the same lock, an effective system must be established for management of the keys.

Locks and keys are for the exclusive use of the holder and may not be loaned to other employees for any reason.

4.2.2 Tags

Tags must be used in conjunction with all locks.

Work units are responsible for ensuring that an adequate supply of tags are available to authorized employees.

All tags must legibly indicate the user name and date of application.

All tags must be securely attached. Use of a locking nylon cable tie is the preferred means of attachment for tags.

Tags must be capable of withstanding the environmental conditions to which they are exposed.

Remove tags when work is completed.

4.2.3 Lockout Devices

Lockout devices include such items as multiple lockout hasps, valve enclosures, circuit breaker lockouts, chains, plug enclosures, and other devices of this nature.

Work units are responsible for ensuring that an adequate supply of lockout devices appropriate for the tasks encountered is made available to authorized employees.

Lockout devices must always be secured with a lock.

4.2.4 LOTO Station Locations

Lockout stations foster an efficient and organized approach to LOTO safety. By going to the same place to retrieve critical lockout devices, workers develop and maintain safe habits. This is the SMU preferred way to allow accessible LOTO resources.

A lockout station stores and organizes padlocks, hasps, tags, and cable ties. Stations provide an organized, standardized arrangement of locks and easy access to those locks.

The station locations must be placed near known equipment or processes that often require the maintenance or servicing activities required the control of hazardous energy. Signage must accompany the location, making it easily identifiable to the employees who may be in need of LOTO devices. The area's must be kept well stocked, the documentation up to date, orderly, and in a clean condition.

4.2.5 LOTO Kit Locations

In some cases, devices need to be frequently moved from one location to the next. For these instances, lockout/tagout kits are a good solution. All portable kits must be stored in the manager's office. The portable kits must be kept well stocked, the documentation up to date, orderly, and in a clean condition.

4.3 Procedures

4.3.1 Workflow

The general procedures noted in the program will be followed by documenting the work on the form in **Appendix A SF-001-1 LOTO Documentation.** The documentation of the procedure is required for all equipment, machinery and/or processes.

Each new or transferred "affected" employee and other employees who work operations are or may be in the area shall be instructed in the purpose and use of the lockout or tagout procedure. The job titles of the affected employees are listed and updated in **Appendix B form SF-001-2 and should be completed when LOTO procedures are in use and updated as needed.** Prior to lockout/tagout, the senior authorized individual will brief affected individuals in person. Each business unit will keep a list of authorized and affected employees and submit to the EHS group annually or as updated.

Refer to and use the general or specific procedure (s) listed on form **Appendix C SF-001-3 List of LOTO Procedures** for your particular business unit. Each business unit will keep a list of LOTO procedures and submit to the EHS group annually or as updated.

If no procedure exists for the isolation of energy notify the business unit manager to use form **Appendix D SF-001-4 New Specific LOTO Procedure** to create a new procedure. The new procedure will be documented on form **SF-001-4** by the business unit manager and maintained in the Environmental Health and Safety (EHS) group and at the business unit's LOTO station.

See next page for General LOTO Procedure

4.3.2 General Lockout/Tagout Procedure:

The following general steps will be taken when locking and tagging out equipment:

1) **Identify all energy sources:** All electrical, hydraulic, pneumatic, and other energy sources feeding the equipment must be identified. Any questionable identification of energy sources should be clarified with supervision prior to beginning any service work.

2) **Notify others:** The authorized employee completing the servicing must verbally notify all "affected" and "other" individuals of the impending equipment shutdown.

3) **Shutdown equipment:** If the equipment is running, it must be shutdown using the normal stopping procedures. (Example: Depress "stop" button, open toggle switch, etc.) Follow the manufacture's shutdown procedure.

4) **Isolate equipment from energy sources:** Once the equipment has been shut down, all energy isolation devices must be operated so that the equipment is disconnected from its energy sources. (Example: Turn electrical disconnects to "Off" or "Safe" position; open electrical circuit breakers; close hydraulic valves; close pneumatic valves, etc.)

5) **Lockout/Tagout the equipment:** Locks and lockout devices must be attached to each energy isolation device in order to prevent the transmission of energy. A tag indicating the lock holder and the date of application must accompany each lock. A tag should also be placed near the equipment's point of operation if it is located remotely from the energy isolation device(s).

6) **Release or Block stored energy:** After the equipment has been isolated and locked/tagged out, all stored energy must be safely controlled. The appropriate bleeding or blocking methods must be used to dissipate stored energy sources (such as hydraulic pressure, pneumatic pressure, steam pressure, suspended parts, spring-driven parts, etc.). Ensure persons are not in the line of fire when testing and releasing the stored energy.

7) **Verify Isolation of equipment:** Prior to beginning any service work, the authorized employee must attempt to restart the equipment using the normal starting procedure or otherwise ensure the effectiveness of the lockout. Operational controls must be returned to the "Off" position after a restart attempt has been completed.

8) **Perform required servicing:** While performing service work, employees must avoid doing anything that could potentially reactivate the equipment.

9) **Restart / Release from Lockout/Tagout:** All locks, lockout devices, and tags must be removed by the same person who applied each item. Prior to restarting equipment, all tools must be removed from the work area and all machine guards must be in place. All "affected" and "other" employees must be verbally informed of the restart and cleared from the equipment area prior to energization.

   (Always check the area twice and announce loudly that Restart is taking place)

4.3.3 Situation and Equipment-Specific Lockout/Tagout Actions:

Each work unit is responsible for developing specific LOTO procedures for equipment serviced by their personnel using form SF-001-4.

The actions listed below must be incorporated into the procedures for LOTO and is not a replacement for the general procedure listed in section 4.3.2.

Specific procedures shall identify the information that an authorized employee must know in order to effectively control hazardous energy sources. If this information is the same for various machines or equipment or if another means of logical grouping exists, then a single energy control procedure may be sufficient. The EHS group should be consulted when making the determination as to whether procedures can be grouped in this manner.

4.3.3.1 Testing or Positioning of Machines

In situations where the lockout/tag out devices must be temporarily removed from the energy isolating device to energize the machine or equipment for testing or repositioning, the following sequence of actions shall be followed:

- Clear the machine or equipment area of tools and materials and notify the task supervisor of intent to remove LO/TO devices.
- Clear all personnel from the machine or equipment areas.
- Have authorized employees remove personal locks and tags.
- Remove the lockout and/or tag out devices.
- Energize and proceed with testing or repositioning.

4.3.3.2 Isolation for Confined Space Entry

In general, all piping and tubing leading into or out of the space must be properly isolated from the space by at least one or a combination of the following:

- Physical disconnection.
- Installation of blinds.
- Double block and bleed.

Blinding or disconnection of each line is the safest and preferred method. If the double block and bleed (DBI) is used the block valves must be locked and tagged closed and the bleed valves must be locked and tagged open.

Note!! A single closed valve is not an acceptable isolation for confined space entry or for potentially hazardous systems that are in the vicinity of same, except when the facility is shut-in and all systems have been bled to atmospheric pressure.

4.3.3.3 Isolation for Hot Work

In general, where equipment or production system isolation is necessary to conduct hot work, the isolation will consist of one or a combination of the following:

- Physical disconnection.
- Installation of blinds.
- Double block and bleed valves.

The double block and bleed is used the block valves must be locked and/or tagged closed and the bleed valves must be locked and/or tagged open.

4.3.3.4 Isolation for Cold Work

The degree of isolation for cold work often may be a single isolation device (i.e., valves, switches, etc.). However, the integrity of the isolation device must be confirmed before it can be used for isolation.

Before work is performed downstream of a single isolation device, consideration should be given to surrounding operations and the environment (e.g., vibration, temperature, hazardous operations, work duration, etc.) and the effects they may have on the single isolation device. These conditions may require a greater degree of isolation and additional precautions should be taken.

4.3.3.5 Electrical Isolations

Electrical work requires a lock and a tag to be used together (29 CFR 1910.333(b)). However, a tag can be used by itself only if the electrical disconnecting source does not have lockout capabilities. Locks can be placed without a tag only under the following conditions:

- Only one circuit or piece of equipment is de-energized.
- The lockout period does not extend beyond the work shift.
- Employees exposed to the hazards associated with re-energizing the circuit or equipment are familiar with this procedure.

If a machine or piece of equipment contains capacitors, they must be drained of stored energy. Possible disconnecting means include the power cord, power panels (look for primary and secondary voltage), breakers, the operator's station, motor circuit, relays, limit switches, and electrical interlocks.

Some equipment may have a motor isolating shut-off and a control isolating shut-off.

If the electrical energy is disconnected by simply unplugging the power cord, the cord must be kept under the control of the authorized employee or the plug end of the cord must be locked out or tagged out.

A qualified person shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are de-energized. The test shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage back-feed even though specific parts of the circuit have been de-energized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment shall be checked for proper operation immediately before and immediately after this test.

4.3.3.6 Work on Energized Circuits

Approval must be obtained from the Office of Risk Management the EHS group prior to any work on energized circuits.

ORM will verify that by de-energizing circuits that it will create additional or increased hazards or it is infeasible due to equipment design or operational limitations.

NOTE: Working on energized parts requires the wearing of appropriate personal protective equipment. EHS will be responsible for specifying appropriate personnel equipment to be used, to ensure compliance with 29 CFR 1910.335.

Personnel protective equipment for electrical hazards shall meet, be used and maintained in accordance with ANSI J6.1 through J6.7.

4.3.3.7 Isolation of Fire Protection Systems

The Office of Risk Management shall be notified prior to the isolation or removal from service of any fire protection detection system, source of energy required to operate any fire protection system, or firewater piping, including local or remote electronic monitoring systems.

All personnel should be made aware of how to manually operate the fire suppression system if it becomes necessary to activate it while the detectors are out of service. The detection devices should be returned to service immediately upon completion of the hot work.

If hot work must be performed in an area where a fire suppression system is out of service (fire water, halon or CO2 system, etc.), extra precautions must be taken. Such precautions include extra fire extinguishers and/or additional standby personnel (Firewatchers). Precautions will vary depending on the size and duration of the job. Performing hot work while fire suppression systems are out of service should be avoided if at all possible.

4.3.3.8 Long-Term Isolation

Equipment that has been isolated or secured for purposes other than undergoing maintenance or repair should be locked out with an “Operations Lock”. Operations locks can be any size, shape or color, but must be different from lockout/tag out locks and NOT used for lockout/tag out purposes.

Operations locks should be accompanied by a tag that clearly indicates the status of the equipment and the danger of removing the device (i.e., Do Not Open, Downstream Equipment Not in Use). Tags should be signed and dated, and should be reviewed periodically to ensure they are still legible and in good condition.

Operations locks should not be removed without obtaining permission from the Worksite Supervisor. Lockout/tag out devices and procedures shall be used if maintenance activities are performed on the equipment or machinery.

4.3.3.9 Hydraulic/Pneumatic

Shut off all energy sources (pumps and compressors). If the pumps and compressors supply energy to more than one piece of equipment, lockout or tagout the valve supplying energy to the piece of equipment being serviced.

Stored pressure from hydraulic/pneumatic lines shall be drained/bled when release of stored energy could cause injury to employees.

Make sure controls are returned to their safest position (off, stop, standby, inch, jog, etc.).

4.3.3.10 Fluids and Gases

Identify the type of fluid or gas and the necessary personal protective equipment.

Close valves to prevent flow, and lockout/tagout.

Determine the isolating device, then close and lockout/tagout.

Drain and bleed lines to zero energy state.

Some systems may have electrically controlled valves. If so, they must be shut off and locked/tagged out.

Check for zero energy state at the equipment.

4.3.3.11 Mechanical Energy

Mechanical energy includes gravity activation, energy stored in springs, etc.

Block out or use die ram safety chain.

Lockout or tagout safety device.

Shut off, lockout or tagout electrical system.

Check for zero energy state.

Return controls to safest position.

4.3.4 Interruption of Lockout/Tagout:

The following sequence of actions must be taken when equipment being serviced under LOTO conditions must be energized for testing or positioning:

- Clear the equipment of all tools and materials.
- Clear personnel from the equipment area.
- Remove any repositioning or blocking devices.
- Remove locks and lockout devices from energy isolation devices.
- Energize equipment and proceed with testing or positioning.

The equipment must be de-energized and locked/tagged out if servicing is to continue after testing or positioning has been completed.

4.3.5 Group Lockout:

When more than one authorized employee is servicing a single piece of equipment, each employee must have their own lock and tag secured to each energy isolation device. This can be accomplished by utilizing a hasp designed to accept multiple locks.

During group lockouts, one group member shall be assigned responsibility for ensuring that all steps of the general LOTO procedure are followed. This person shall attach a hasp to each energy isolation device. All employees or contractors involved in the servicing must then attach their own locks and tags to each hasp.

Employees shall remove their own locks and tags after they have completed their portion of the work. The group member shall always remove their locks and tags last. Once this has been done, this same person is then responsible for ensuring the equipment is energized.

Alternative group lockout procedures must be approved by EHS in writing. Such procedures must afford all employees a level of protection equivalent to that provided by a personal lockout or tagout device. This includes the use of a group lockout box as an alternative to a hasp.

4.3.6 Shift Change Coordination:

LOTO protection must not be interrupted when servicing lasts longer than one shift. If the equipment is the sole responsibility of authorized employees on a single shift, locks and tags shall be left in place until the servicing is complete.

If it is necessary for servicing to continue into the next shift, the oncoming employee shall attach their locks and tags to each energy isolation device prior to the outgoing employee removing their locks and tags.

Alternative shift change procedures must be approved by EHS. Such procedures must ensure continuity of LOTO protection for all employees.

4.4 Lock Removal

If it becomes necessary to remove a lock when the owner is not available, the lock owner's supervisor must be notified. **Appendix E form SF-001-5 Emergency Lock Removal** must be used to document locks removed by someone other than the lock owner. The form will be filed by the business unit and submitted to the EHS group. The supervisor may remove a lock **ONLY after each** of the following steps has been taken:

- It has been verified that the lock owner is not at the work site.
- Attempts have been made to contact the lock owner at home.
- A determination has been made as to why the lock was applied.
- Supervision or their direct designee has inspected the equipment and determined that the removal of the lock does not create a safety hazard.
- Provisions have been made to notify the lock owner of the lock removal BEFORE they have returned to resume work on the equipment.

4.5 Contract Personnel

Whenever contract personnel are to be engaged in activities covered by this Program, the primary SMU manager and the contract employer shall inform each other of their respective LOTO procedures. Any failure in procedure, near miss, hazard identification, or incident related to LOTO or Control of Hazardous Energy will be reported to the EHS group within one hour of knowledge of the occurrence.

The exchange of LOTO procedures between SMU and the contract employer must take place before beginning any service activities subject to LOTO. The Group LOTO procedure will most likely be used. The primary SMU contact and the contract employer will ensure that their personnel understand and comply with one another's LOTO procedures.

Contract employers are responsible for ensuring that their personnel understand and comply with the requirements of OSHA standard 29 CFR 1910.147, "Control of Hazardous Energy".

5.0 Roles and Responsibilities

5.1 Executives and Administrators

- Ensure that responsibilities assigned within this program are carried out within their administrative work units.
- Monitor implementation of this program within their work unit.
- Ensure adequate funding is available to support this program.

5.2 Environmental Health and Safety Group (EHS)

- Assist work units in implementing the provisions of this program.
- Develop training materials related to this program.
- Assist in providing general Control of Hazardous Energy training to employees.
- Maintain records in accordance of this document.
- Periodically audit and update the Control of Hazardous Energy Program and procedures as needed.
- Coordinate implementation of the program within the work unit.
- Ensure equipment-specific LOTO procedures are developed within the work unit.
- Ensure required training is provided to employees within the work unit.
- Assist in the investigation of all injuries and incidents involving the control of hazardous energy.
- Ensure that the records of this document are maintained for their work unit.

5.3 Directors and Managers

- Be thoroughly informed of the contents of this Program and how it applies to their areas of responsibility and authority.
- Ensure employees comply with all provisions of the program.
- Identify all authorized employees under their supervision.
- Ensure authorized employees receive general Control of Hazardous Energy training and affected employees receive affected employee training.
- Provide training to employees on equipment-specific LOTO procedures within the work unit.
- Maintain records in accordance of this document.
- Ensure copies of each LOTO documentation (SF-001-1) are delivered weekly to EHS.
- Update and maintain copies of the specific procedure list (SF-001-3) that is required for all equipment, machinery and/or processes.
- Ensure copies of newly created procedures (form SF-001-4) are delivered when created to EHS. The new procure will be documented on form SF-001-04 by the business unit manager and maintained in the EHS and the business unit's LOTO station.
- Make positive changes based upon corrective actions as determined from annual review of program and periodic permit assessments.
- Investigate all injuries and incidents involving control of hazardous energy.
- Ensure that employees are provided with sufficient locks, tags, and lockout devices.
- Complete annual LOTO inspections in accordance this document.
- Take prompt corrective action when unsafe conditions or practices are observed.

5.4 Employees

- Comply with all provisions of the program.
- Attend training sessions as required.
- Promptly report any concerns related to the Control of Hazardous Energy to their immediate supervisor.

6.0 Goals, Objectives and Performance measures

Work Unit and Contractor performance measures related to this program are incorporated into scorecards.

Individual performance measures related to this program are incorporated evaluations and monitoring.

6.1 Performance Measures

It is the Goal of SMU to have Zero accidents. This goal can only be met by setting objectives and measuring our current performance against those objectives. Audits and inspections of the Program and usage of the Program by SMU employees and contractors will take place periodically and annually.

Department performance measures are will be incorporated into EHS scorecards. Individual performance measures related to this Program may be incorporated evaluations and monitoring.

6.2 Periodic Inspections

Supervisors of authorized employees are responsible for completing periodic inspections on at least an annual basis in order to ensure adherence to the procedures described in this document. As part of the review, SMU must correct any deviations and inadequacies identified in the energy-control procedure or its application. The inspector, usually a supervisor who must be an authorized person not involved in using the particular control procedure being inspected, must be able to determine the following:

- Employees are following steps in the energy-control procedure;
- Employees involved know their responsibilities under the procedure; and
- The procedure is adequate to provide the necessary protection, and what changes, if any, are needed.
- Inspection records are to be maintained by the work unit and must be available for review by EHS.

6.3 Annual Inspections

At least annually, SMU must inspect and certify all energy control procedures. They must also ensure compliance with 29 CFR 1910.147 Control of Hazardous Energy (Lockout and Tagout). An authorized employee must perform the annual inspection. The inspection documents will be kept on record with EHS for three years.

The inspection documentation must identify:

- Equipment
- Date of the inspection
- Person performing the inspection and all employees included in the inspection
- Accuracy of procedural steps for de-energizing equipment, employee knowledge and accountability
- Assessing procedures and correcting deviations of inadequacies identified during the inspection

6.4 Consequences

ORM will record any reports or observations of unsafe operations or conditions. Failure to follow this program, the procedures, render common practices or courtesies, or follow regulation standards may resulting in progressive disciplinary action up to and including termination.

7.0 Training

The level of Control of Hazardous Energy training provided to employees is based on their level of involvement with Control of Hazardous Energy procedures.

At a minimum SMU employees will receive initial and annual refresher training in of the Control of Hazardous Energy. Training must ensure that employees understand the purpose, function, and restrictions of the energy-control program. SMU will provide training specific to the needs of "authorized," "affected," and "other" employees.

- **"Authorized"** employees are those responsible for implementing the energy-control procedures or performing the service or maintenance activities. They need the knowledge and skills necessary for the safe application, use, and removal of energy-isolating devices. They also need training in the following:
  - Hazardous energy source recognition;
  - The type and magnitude of the hazardous energy sources in the workplace; and
  - Energy-control procedures, including the methods and means to isolate and control those energy sources.

- **"Affected"** employees (usually machine operators or users) are employees who operate the relevant machinery or whose jobs require them to be in the area where service or maintenance is performed. These employees do not service or maintain machinery or perform lockout/tagout activities. Affected employees must receive training in the purpose and use of energy-control procedures. They also need to be able to do the following:
  - Recognize when the energy-control procedure is being used,
  - Understand the purpose of the procedure, and
  - Understand the importance of not tampering with lockout or tagout devices and not starting or using equipment that has been locked or tagged out.

All other employees whose work operations are or may be in an area where energy-control procedures are used must receive instruction regarding the energy-control procedure and the prohibition against removing a lockout or tagout device and attempting to restart, reenergize, or operate the machinery.
In addition, if tagout devices are used, all employees must receive training regarding the limitations of tags.

SMU will provide initial training before starting service and maintenance activities and must provide retraining as necessary. EHS offers this training online via SafetySkills. Please contact EHS to sign up for this training. It is the managers responsibility to ensure the applicable employees are trained and retrained in accordance with this program.

Training on specific equipment LOTO procedures may be carried out by the department responsible for the maintained or serviced equipment. EHS is available to assist with this training, and retraining, when necessary.

SMU will provide retraining for all authorized and affected employees whenever there is a change in the following:

- Job assignments,
- Machinery or processes that present a new hazard, or
- Energy-control procedures.

Retraining also is necessary whenever a periodic inspection reveals, or SMU has reason to believe, that shortcomings exist in an employee's knowledge or use of the energy-control procedure.

Work units are responsible for maintaining a record of all equipment specific Control of Hazardous Energy training provided to their employees with copies provided the EHS Group. EHS will maintain records of Control of Hazardous Energy training provided by EHS personnel.

SMU will keep records of employee training. The training records will include employee name, training date, and the content of the training. Keep documentation on training for at least three years from the training date.

EHS maintains and tracks EHS training logs. It is the managers responsibility to ensure any training or retraining sign in sheets or attendance logs are delivered to the ORM for credit and regulatory compliance.

8.0 Program Evaluation

The ORM will review the effectiveness of the Program by:

- Verify and document that all qualified persons have had appropriate training.
- Provide common procedures used for specific equipment, identified by type and location used to control hazardous energy (including shutdown).
- Review of injuries related to equipment operations.
- Review of incidents related to applicable operations.
- Document and review the periodic inspections and annual Program inspections of Control of Hazardous Energy use as documented by individual departments. Identification of any deficiency will result in an appropriate change in procedures, or other measure being taken.
- Providing an annual review of the Control of Hazardous Energy Program for compliance and opportunities for improvement.
- Revise the written Control of Hazardous Energy Program as required.

9.0 Resources

Business Units shall ensure that appropriate resources are identified, allocated, and verified to ensure this Program is communicated and implemented.

10.0 Associated Forms, Documents, and References

10.1 Forms

Appendix A: (Authorized Employee) LOTO Documentation SF-001-1
Appendix B: (Director or Manager) List of Authorized LOTO Persons SF-001-2
Appendix C: (Director and Manager) List of Approved Procedures SF-001-3
Appendix D: (Director and Manager) New Specific LOTO Procedure SF-001-4
Appendix E: (Director and Manager) Emergency Lock Removal SF-001-5
Appendix F: (Director and Manager) Periodic Review SF-001-6
Appendix G: (Office of Risk Management) Annual Program Review SF-001-7

10.2 Document Control

Owner Departments must keep records concerning Control of Hazardous Energy documentation, inspections, inventories and training.

All records must be kept for a minimum of 3 years within the department. The records must be made available to regulatory agencies such as OSHA and EHS upon request.

SMU will keep records of employee training. The training records will include employee name, training date, and the content of the training. Keep documentation on training for at least three years from the training date.

10.3 References

- OSHA 29 CFR 1910.147 The Control of Hazardous Energy
- OSHA Lockout/Tagout Fact Sheet
- NFPA 70E, “Standard for Electrical Safety Requirements for Employee Workplaces
- API 6DSMU

11.0 Reviewed By

Date of Review	Reviewed By	Reason for Review
01-08-2018	EHS Group	Internal audit for compliance, design control
01-11-2018	Manager Review Group	Awareness, EHS quality process- Management Review
01-26-2018	AVP / CRO	Approval of draft program
	Legal	
	Human Resources	

12.0 Revision History

Revision Number	Date of Revision	Revision Description	Basis for Revision
Draft	01-11-2018		
V1	01-26-2018	Out of draft status	Internal reviews completed

13.0 Decision Record

Date of Decision	Approved By	Decision Description	Basis for Decision
01-26-2018	AVP / CRO	Implementation of program	EHS quality process - Continual Improvement

SMU Form	LOTO DOCUMENTATION
Owner: Risk Management **Revision No:** 01	**Document number:** SF-001-1 **Date last revised:** 01-26-2018

Use of the document is required for all equipment, machinery and/or processes in tandem with written procedure, listed on form SF-001-3. If no procedure exists, use form SF-001-4 to create a new procedure.

Department:		Date:		Documented By:	
Equipment/System:		Location:			
Purpose					

Equipment	Energy Source and Type (Electrical, Heath, Steam etc)	Isolation Device (Circuit Breaker, Valve, Block, etc)	Locked or Tagged? Owner Name?	Method of Releasing Stored Energy (ground, open valve etc)	Verified Isolation (Yes or No)

1. Identify all energy sources: All electrical, hydraulic, pneumatic, and other energy sources feeding the equipment must be identified. Any questionable identification of energy sources should be clarified with supervision prior to beginning any service work.
2. The authorized employee completing the servicing must verbally notify all “affected” and “other” individuals of the impending equipment shutdown. Follow the manufacturer’s shutdown procedure.
3. Deactivate the machine.
4. Isolate equipment from energy sources.
5. Lock out the energy isolating device(s) with assigned individual lock(s).
6. Stored or residual energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.
7. Prior to beginning any service work, the authorized employee must attempt to restart the equipment using the normal starting procedure or otherwise ensure the effectiveness of the lockout. Operational controls must be returned to the “Off” position after a restart attempt has been completed.
8. The machine or equipment is now locked out. Conduct service and maintenance work.
9. Once work is completed, notify Affected Employees, remove lockout devices, and follow manufacturer’s startup procedures.

PERSONS AUTHORIZED TO USE PROCEDURE (NAME AND PHONE NUMBER)	

LIST OF AUTHORIZED AND AFFECTED LOTO INDIVIDUALS

LIST OF AUTHORIZED PERSON AND EQUIPMENT

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EQUIPMENT	LOCK #	NAME	MECHANICAL YES/NO	ELECTRICAL YES/NO

LIST OF AFFECTED LOCKOUT AND TAGOUT INDIVIDUALS

WORK AREA	NAME

NOTE: AUTHORIZED ELECTRICAL LOCKOUT/TAGOUT REQUIRES QUALIFIED WORKER INACCORDANCE WITH SUBPART "S" 29 CFR PART 1910.

NOTE: The LIST OF AUTHORIZED TABLE is a list of names and job titles of persons authorized to lockout and tagout. Each new or transferred "affected" employee and "other" employees who work operations are or may be in the area shall be instructed in the purpose and use of the lockout or tagout procedure. The job titles of the affected persons are contained in THE LIST OF AFFECTED TABLE. Prior to lockout/tagout, the senior authorized individual will brief all affected employees in person. In the event of tagout system only, the authorized individual will also brief all other personnel potentially exposed to the hazard in person. The procedures noted in the LOCKOUT OR TAGOUT SYSTEM PROCEDURE will be followed.

SMU. Form	LIST OF LOTO PROCEDURES
Owner: Risk Management **Revision No:** 01	**Document number:** SF-001-3 **Date last revised:** 01-26-2018

LIST OF PROCEDURES

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WORK CENTER	EQUIPMENT #	MACHINERY, EQUIPMENT OR PROCESS

SMU Form	NEW SPECIFIC LOTO PROCEDURE
Owner: Risk Management **Revision No:** 01	**Document number:** SF-001-4 **Date last revised:** 01-26-2018

Refer to and use the general or specific procedure listed on form SF-001-3 for your particular business unit. If no procedure exists for the isolation of energy notify the **business unit manager to use this document to create a new procedure**. The new procure will be documented on SF-001-3 by the business unit manager and maintained in the EHS group and the business unit's LOTO station. This document is to be turned in to EHS after use.

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EQUIPMENT, MACHINERY, OR PROCESS: _____

DEPARTMENT: _____

LOCKOUT PROCEDURE #: T/O -___ - ____

DATE APPROVED/IMPLEMENTED: _____

TYPE(S) AND MAGNITUDE(S) OF ENERGY AND HAZARDS:

_____
_____
_____

NAME(S)/JOB TITLE(S) OF EMPLOYEES AUTHORIZED TO LOCKOUT/TAGOUT:

_____
_____
_____
_____

NAME(S)/JOB TITLE(S) OF AFFECTED EMPLOYEES AND HOW TO NOTIFY:

_____
_____
_____
_____

NAME(S)/JOB TITLE(S) OF OTHER EMPLOYEES:

_____
_____
_____

TYPE(S) AND LOCATION OF ENERGY ISOLATING MEANS:

_____
_____
_____
_____
_____
_____

NOTES:_____
_____
_____

SMU Form	EMERGENCY LOCK REMOVAL PROCEDURE
Owner: Risk Management **Revision No:** 01	**Document number:** SF-001-5 **Date last revised:** 01-26-2018

This procedure may be used to remove the lock of a Lockout Authorized Employee who is not on campus when the machinery or equipment must be restarted prior to the Lockout Authorized Employee's return to campus. This procedure may only be implemented by the supervisor of the unavailable Lockout Authorized Employee or, in the event of a group lockout, the Primary Lockout Authorized Employee.

Removal Procedure Information			
Department:		Date:	
Machine/System:		Machine/System Location:	

Attempt to contact the employee to whom the lock belongs to determine the status of the lockout procedure and advise that the lock will be removed. Method(s) of contact: _____(phone, email, text)

1. The supervisor must inspect the work area to verify the lockout status and work progress on the machinery or equipment.
2. Remove the Authorized Person's lock. The supervisor must ensure that lockout integrity is maintained.
3. The supervisor will then assure that the service or maintenance work is completed in order to close the lockout procedure.
4. The supervisor must discuss the status of the work with the Lockout Authorized Employee prior to the Lockout Authorized Employee returning to the work location.

Authorization		
I was informed of the status prior to my return to the work location.	Employee Name:	
	Signature	
I certify that I have followed and completed this procedure.	Supervisor Name:	
	Signature:	

SMU Form	CONTROL OF HAZARDOUS ENERGY PERIODIC REVIEW
Owner: Risk Management **Revision No:** 01	**Document number:** SF-001-6 **Date last revised:** 01-26-2018

Directions:

- Conduct periodic inspections **at least annually**
- Use one form for each machine or equipment that has a written Lockout/Tagout Procedure
- Keep the original on file and **send a copy to the EHS Group**

Department/Shop:	**Unit:**	**Date:**
Machine/Equipment Inspected:		

Employees included in the inspection:

1.	2.	3.
4.	5.	6.
7.	8.	9.

Review the Lockout/Tagout Procedures and employee responsibilities with the authorized employees and complete the following:

1. Do the employees understand the Lockout/Tagout Procedures and their responsibilities under the University Lockout/Tagout Policy?
❑ YES ❑ NO If no, indicate corrective action taken:
_____

2. Do the employees follow the Lockout/Tagout Procedures?
❑ YES ❑ NO If no, indicate corrective action taken:
_____

3. Are the established Lockout/Tagout Procedures effective to provide full protection?
❑ YES ❑ NO If no, indicate corrective action taken:
_____

4. Other discrepancies noted and corrective actions taken:
_____
_____

Person(s) Conducting Inspection:

Name:	Signature:	Department:
Name:	Signature:	Department:

SMU Form	CONTROL OF HAZARDOUS ENERGY ANNUAL REVIEW
Owner: Risk Management **Revision No:** 01	**Document number:** SF-001-7 **Date last revised:** 01-26-2018

Department:		Date:	
DEPARTMENT Supervisor:		EHS Reviewer:	

	Yes	No
1. Are department personnel who conduct work covered by this program trained as Lockout Authorized Employees? List those who are not trained but need it.		
2. Are department Lockout Authorized Employees familiar with and follow the General Lockout Procedure?		
3. Have Energy Control Procedures been developed in accordance with the General Lockout Procedure? List Energy Control Procedures needed.		
4. Does the department have adequate locks, tags, and lockout devices? List what is needed.		
5. Does the department conduct Group Lockout? Review procedure.		
6. Does the department conduct lockout work across shift/personnel changes? Review procedure.		
7. Have Lockout Authorized Employees demonstrate Energy Control Procedures or General Lockout Procedure as appropriate. List Energy Control Procedures demonstrated and the Lockout Authorized Employee who demonstrated.		