UNIVERSITY OF NOTRE DAME

Lock, Tag, and Try
Zero Energy
Procedure

1. Purpose

   1.1. To protect personnel from hazards associated with the unexpected energization, start-up, or release of energy from machinery and equipment during maintenance, repair, servicing or modifications. This program is to enable compliance with 29 CFR 1910.147 “The Control of Hazardous Energy (Lockout/Tagout)”.

2. Scope
   2.1. This applies to equipment and machinery at the University where potentially hazardous energy exists. Employees and contractors who maintain or service such equipment are subject to this procedure.
   2.2. The procedure applies to the control of hazardous energy, including electrical, mechanical, hydraulic, pneumatic, chemical, thermal, potential, kinetic, and any other form of energy, during servicing or maintenance of equipment.
   2.3. The Power Plant and Utilities Distribution equipment and personnel are outside the scope of this procedure. Isolation of Power Plant and Utilities Distribution equipment shall begin by making a request for Lockout / Tagout at the Utilities Department, 100 Facilities Building.

3. Definitions

   3.1. Authorized Employee – A person qualified to perform a lockout procedure by virtue of training and demonstrated competency.

   3.2. Affected Employee – Anyone working in an area where a lockout procedure is occurring.

   3.3. Contractor Point of Contact – An employee who contacts and/or directs outside contractors regarding work they are to perform at the University.

   3.4. Control Circuit – The control circuit carries electrical signals that direct the performance of the equipment, but does not carry the main power current.

   3.5. Energy Control Procedure – A document that lists all sources of energy and the associated energy isolation points for a specific piece of equipment or process, as well as the steps to effectively de-energize and re-energize the system.

   3.6. Energy Isolating Device – A mechanical device that physically prevents the transmission or release of energy. Examples of energy isolating devices include a manually operated electrical circuit breaker; a manually operated primary electrical disconnect switch; a line valve, blank, or blind; or any similar device used to block or isolate energy. The term does not include a push button, selector switch, and other electrical control circuit type devices. Wherever possible, energy isolating devices shall be permanently and clearly labeled to

identify the name, or section, of the equipment or process that it isolates.

3.7. Exclusive Control – A cord and plug set that is the only power source to the equipment, it is unplugged, and it is in the immediate control of the exposed individual (e.g., electrical plug is lying at that person's feet).

3.8. Group Lockbox – A device used for multiple energy sources containing a set of color-coded locks and tags. This box is then secured with personal locks and tags from each Authorized Employee and/or contractor employees working on the equipment or process. One box shall be used for each specific lockout of equipment or processes.

3.9. Lockout – The placement of a lockout device on an energy isolating device ensuring that the equipment being controlled cannot be operated until the lockout device is removed.

3.10. Lockout Device – A device that uses a positive means, such as a lock, chain and lock combination, etc., to hold an energy isolating device in the de-energized position and prevent the energizing of a machine or equipment. Lockout devices shall be identified, standardized, durable, substantial, and may not be used for any other purpose.

3.11. Long Term Equipment Isolation – Equipment isolation to prevent unauthorized use during times when service / repair is not occurring. Equipment out of service or maintenance work waiting an extended time on parts are examples of situations that may warrant long-term equipment isolation.

3.12. Multiple Lockout Device – A device that allows more than one lock to be attached to an energy isolating device, thus assuring that each authorized employee has individual lockout and control capability.

3.13. Personal Lock – A red lock issued to an Authorized Employee that is used with a tag bearing his/her name to control the release of hazardous energy during maintenance or servicing. Each personal lock shall have only one key.

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

3.15. Tag – A means of providing identification for lockout devices. Tags shall not be used in lieu of a positive means to isolate energy, such as, a lock, blank, chain and lock combination, and other similar devices.

3.16. Zero Energy State (ZES) – Where all the energy sources (electrical,

mechanical, hydraulic, pneumatic, chemical, thermal, kinetic, and any other form of energy) are properly removed or protected by following this procedure.

4. Overview
   4.1. Lock / Tag / Try (LTT) is the means by which personnel are assured that a potentially dangerous system is properly shutdown, isolated, and verified safe prior to initiating service or maintenance activities.
   4.2. Authorized Employee(s) shall always apply and remove their own personal locks and tags to an energy control device.
   4.3. Personnel shall not attempt to operate any equipment isolated by locks and tags or remove any energy isolation devices that belong to someone else unless the Emergency Lock Removal Process is followed (Section 14).
   4.4. This procedure does not apply to minor tool adjustments and other minor servicing activities that take place during normal production operations if these activities are routine, repetitive and integral to the use of the equipment for production. Alternative measures shall be implemented which provide effective protection from hazards associated with the control of hazardous energy (e.g., unexpected start-up). However, if these activities place the individual in a potentially hazardous position, this procedure shall be followed.

5. Responsibilities
   5.1. Authorized Employees
      5.1.1. Participate in required training.
      5.1.2. Use energy control procedures in order to safely shutdown, isolate, and verify zero energy state before performing repairs or maintenance.
      5.1.3. Notify supervision of questions about isolating energy sources or if a problem with the energy control procedure is identified.
      5.1.4. Communicate to affected employees or their supervisor that the equipment is being shut down and locked out for service and maintenance.

   5.2. Contractor Point-of-Contact
      5.2.1. Facilitate communication between contract employees and the department responsible for the equipment or process to ensure the contractor is provided energy control procedures, when applicable.
      5.2.2. Attend authorized LTT training to become familiar with University expectations.
      5.2.3. Correct any LTT deficiencies observed while repair or service work is being performed by a contractor.
      5.2.4. Conduct and document field observations of contractors implementing this procedure. See Section 18.1.4.
      5.2.5. Responsible for ensuring contractors and other non-University personnel

performing work on equipment, under their supervision adhere to proper LTT procedures.

5.3. Manager / Supervisor / Principal Investigators (Lab Managers)
- 5.3.1. Ensure this program is enforced within their areas of responsibility.
- 5.3.2. Identify personnel who need LTT training and ensure that training is provided.
- 5.3.3. Ensure energy control procedures are developed and available for Authorized Employee use.
- 5.3.4. Ensure all necessary equipment needed to perform LTT tasks is obtained and provided for authorized employees.
- 5.3.5. Observe Authorized Employee(s) performing Lock / Tag / Try operation annually and correct any deviations or inconsistencies identified. Document evaluations using the Lock / Tag / Try Field Audit Form (Appendix B)
- 5.3.6. Communicate to Affected Employees if notified by an Authorized Employee that equipment isolation is going to occur.

5.4. Environmental Health and Safety
- 5.4.1. Maintain this written program to meet regulatory requirements and review the program annually to assure it is current.
- 5.4.2. Assure that appropriate LTT training programs are in place and current.
- 5.4.3. Provide technical and program development assistance to ensure the program is successfully implemented.

6. Energy Control Procedures

6.1. Energy control procedures shall be developed and documented for individual equipment and/or processes prior to maintenance or service being performed using Appendix A or a similar template.

6.2. Energy isolating devices shall have a uniform label, which is adequate, durable and marked to indicate its function. Examples of energy isolating devices that shall be marked include electrical disconnects, circuit breakers, valves, and control panel functions, etc.

6.3. Each energy control procedure shall be posted nearest the main disconnect point or control panel containing the control devices for a particular machine, line, process,or other type of equipment.

6.4. Identification of energy isolating devices used for lock / tag / try shall correspond with the energy control procedure.

6.5. Each energy control procedure shall be developed and authorized by an individual who has knowledge of the equipment and understands how to properly de-energize it and take the equipment to a “zero energy” state.
- 6.5.1. Exception: energy control procedures are not required to be documented if the equipment has only one energy source and that energy source can be isolated

using only one energy isolation device.

7. Personal Locks and Tags
   7.1. Locks for the purpose of energy isolation shall not be used for other purposes (e.g. securing belongings).
   7.2. Authorized Employees shall use locks identified in Appendix D. If lockout hardware is required, the authorized employee's supervisor shall contact the University Locksmith Services at (574) 631-4218 to obtain locks. This is to ensure consistency.
   7.3. Table 1 depicts lock colors.

Table 1
Lock Colors and Use

Red	Personal Lockout Lock
Blue	Group Lockout Lock
Green	Long Term Equipment Isolation

   7.4. Tags shall accompany locks in order to identify who applied the lock. Locks with integrated or imprinted tags are acceptable. A tag similar to what is pictured in Appendix D shall be used.

8. Implementing Lock / Tag / Try
   8.1. Authorized employees shall prepare for lock, tag and try by following an energy control procedure (Section 6) or creating an energy control procedure. This requires identifying all energy sources and locating the energy isolating devices (electrical disconnects, valves, etc.) to which the lockout/tagout devices shall be attached.
   8.2. Authorized employees shall ensure that communication with affected employees occurs regarding the necessity to isolate equipment and the expected down time.
   8.3. Authorized employees shall secure the equipment using established shutdown procedures. If the equipment was shut down due to a power failure, emergency stop procedures, or for unknown reasons, all operating controls shall be placed in the "off" or "neutral" position.
   8.4. All potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, and otherwise rendered safe.
   8.5. Authorized employees shall attach locks and tags to all energy isolating devices per the energy control procedure. Each authorized employee shall attach their own personal lock and tag. The key to the lock(s) shall be kept with the authorized employee (the person who applied the lock and tag).
   8.6. All locks shall be accompanied by a DANGER – Do Not Operate Tag (Appendix D) that includes the Authorized Employee's name.
   8.7. Authorized employees shall test the correct installation of all lockout devices by

attempting to start the equipment using the normal operating controls after the energy control procedure has been fully implemented.

8.8. Authorized employees shall return the operating controls to the “neutral”, “off”, or “safe” position once the test is completed. This helps prevent an unexpected start-up when power is restored.

8.9. Authorized employees may now perform service or maintenance on the equipment.

8.10. When the lockout activity is complete or at the end of the shift or workday, the authorized employee shall remove the personal lock and tag from the equipment.

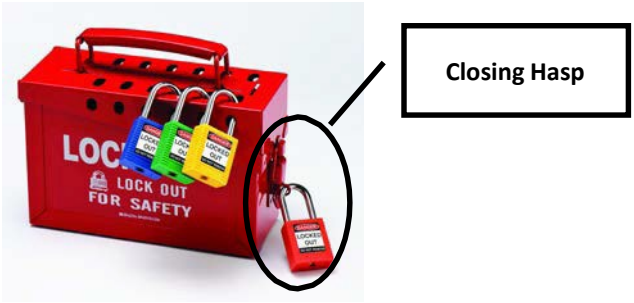
9. Group Lockout

9.1. The supervisor or other authorized employee may lockout the equipment for all participating in lockout by following the energy control procedure and placing a blue lock and tag on each isolation point.

9.2. All keys to locks used to isolate the equipment shall be placed in the group lock box.

9.3. The person who applied the group locks to the energy isolation points shall place his/her personal lockout lock and tag on the **closing hasp** (Photo 1) of the group lockbox or note on the lock/tag that they applied the locks to the energy isolation points. This is to signify who performed the energy isolation.

Photo 1



9.4. Each authorized employee working under the group lockout shall review that the application of the lockout devices was completed in accordance with the energy control procedure. They shall be given the opportunity to test the lockout by attempting to start the equipment by using the normal operating controls. Once complete, the controls shall be placed in the “neutral”, “off”, or “safe” position.

9.5. Each authorized employee working on the equipment shall place a red personal lock and tag on the lockbox.

9.6. Each authorized employee placing a personal lock and tag on a lockbox shall keep the key to the lockout lock on their person. The authorized employee shall test the correct installation of all lockout devices by attempting to start the equipment using the normal operating controls following the energy control procedure.

9.7. Authorized employees shall return the operating controls to the “neutral”, “off”, or “safe” position. This help prevents an unexpected start-up when power is restored.
9.8. When the lockout activity is complete or at the end of the shift or workday, authorized employees shall remove their personal lock and tag from the group lockbox. If the lockout activity carries over to a later date or time with the equipment still under service or maintenance the authorized employees planning to resume work may leave their locks in place.
9.9. Once all personal locks have been removed, the supervisor or other authorized employee shall remove the keys from the lockbox, unlock the equipment, assure that the area is clear, notify the affected employee(s), and restart the equipment.

10. Shift or Personnel Change
10.1. A lockout that extends beyond one shift may require coordination with the oncomingauthorized employee(s). Energy isolation shall be maintained by having the oncoming authorized employee(s) place their personal lock on the group lock box or energy isolation point before the outgoing authorized employee removes their personal lock or immediately thereafter. The oncoming authorized employee shall ensure the equipment was properly isolated by following Section 8 of this procedure.

11. Restoring Equipment to Normal Operation
11.1. After the servicing or maintenance is complete, the authorized employee shall ensure all tools, parts, excess materials, etc., have been removed from the equipment and reinstall all guards.
11.2. The authorized employee shall check the area around the equipment to ensure that no one is exposed to any hazard caused by equipment re-energization and startup.
11.3. The authorized employee shall notify affected personnel that lockout devices are being removed and the equipment will be returned to normal operations.
11.4. The authorized employee shall remove the lockout devices and restore power to the equipment.
11.5. The authorized employee shall restart the equipment following normal operating procedures to test and determine the effectiveness of the service, maintenance, or repair.
11.6. The authorized employee shall notify affected personnel that normal equipment operation may resume.

12. Troubleshooting, Testing, and Tool Adjustment
12.1. Circumstances may warrant troubleshooting tasks be performed with energized equipment. This work shall only be performed for analyzing and diagnosing potential problems. The authorized employee shall:
12.1.1. Prior to troubleshooting, notify affected employees that lockouts or

equipment safeguards will be removed for trouble shooting, testing, tool adjustments, etc.

12.1.2. Verify that removing lockouts or equipment safeguards will not create additional hazards or exposures (tools, process, open lines, exposed gears, shafts, fluids, etc.).

12.1.3. Remove lockouts or equipment safeguards

12.1.4. Perform troubleshooting, testing, and tool adjustments, etc.

12.1.5. Lockout equipment and reestablish appropriate equipment safeguards. Before any repairs or maintenance begins again, the system shall be appropriately isolated, locked and tagged the tested for proper de-energization.

13. Cord and Plug Equipment

13.1. Equipment connected to an electrical power supply by means of a cord and plug is excluded from LTT requirements provided:

13.1.1. The equipment is unplugged during maintenance or service.

13.1.2. The plug is in exclusive control of the exposed individual, example, at the authorized employee's feet.

13.1.3. The electrical plug is the only power source to the equipment.

13.1.4. The equipment has only one energy source and no potential for stored energy such as a capacitor.

13.1.5. The authorized person attempts to start the equipment using normal operating controls then return the operating controls to the "neutral", "off", or "safe" position.

13.2. If these conditions are not met, a lockout device and tag shall be attached to the plug and appropriately locked out.

14. Emergency Lock Removal

14.1. When the authorized employee and/or contractor who applied the lock and tag is not available to remove it, that device can only be removed under the direction of the designated supervisor and an Environmental Health and Safety representative. The steps outlined in Appendix C shall be followed each time an emergency lock removal occurs. This includes:

14.1.1. Verifying the equipment is operable and capable of safely being placed back in service.

14.1.2. Verifying the employee is no longer on the premises using methods such as checking time clock records and looking for the employee's vehicle.

14.1.3. Attempting to contact the authorized employee by phone. Notre Dame Security Police can provide employee emergency contact phone numbers and may have security camera footage of employee leaving campus, if required.

14.1.4. Once the steps above have been completed and the person has not been contacted, leave a voicemail or send email informing the authorized employee that their personal lock is being removed and to contact their supervisor before beginning work.

14.2. Remove the abandoned personal lockout lock.

15. Long Term Equipment Isolation

15.1. If equipment is taken out of service and not operable for an extended period for reasons other than protection of personnel, the equipment may be isolated using a green long-term equipment isolation lock. The green lock signifies that the equipment is not safe to operate and no one is actively making repairs to the equipment. Before maintenance or service work resumes, the equipment shall be isolated by adhering to Section 8 of this procedure.

15.2. Equipment isolated long term shall be accompanied by a tag which identifies who isolated the equipment, the reason the equipment is out of service, and the date the equipment was isolated.

16. Contractors

16.1. The contract employer shall train their authorized employees and shall provide proof of training when requested by the University of Notre Dame.

16.2. Contractor authorized employees shall be familiar with the University of Notre Dame Lock, Tag, Try procedure.

16.3. Contractor authorized employees shall coordinate LTT with the University of Notre Dame Contractor Point-of-Contact. This includes the notification of affected employees.

17. Training

17.1. **Affected employees** shall receive training on the general requirements of the LTT Program initially upon job assignment. The training shall include the specific instructions that they are not to attempt to restart equipment that is locked out or attempt to remove lockout isolation devices.

17.2. **Authorized employee** training shall occur initially and annually thereafter. This training shall include:

17.2.1. Instruction in the recognition of applicable hazardous energy sources, the type and magnitude of energy available in the workplace, and the methods and means necessary for energy isolation and control.

17.2.2. The location and use of the energy control procedures.

17.3. Retraining shall also occur when there are changes in this procedure or it is discovered that there is a deficiency in knowledge.

17.4. Training records shall be maintained per the University Record Management andArchive Policy.

18. Program Assessments

18.1. Periodic Inspections

18.1.1. On an annual basis documented inspections must be performed of:

- Each of the organization's equipment specific LTT procedures and,
- Each authorized employee's responsibilities under the LTT procedures.

18.1.2. **LTT Procedure Inspections:** LTT procedure inspections shall include verification of accuracy that each procedure contains:

- Type and location of equipment covered by the procedure
- Intended purpose
- Identification of each actual or potential energy source as to type, magnitude, isolating method, isolating device location, and means of isolation verification.
- Location and ID of each energy isolation device – or lockout point.
- Specific steps for the LOTO sequence, including placement, removal, and transfer of LOTO devices.

18.1.3. **Authorized employee inspections:** Authorized employee inspections verify each authorized employee's understanding of lockout concepts and the ability to correctly follow energy control instructions.

- Each authorized employee must physically demonstrate lockout of at least one piece of equipment annually.
- The authorized employee performing the field observation shall be someone other than those actively performing the lockout.
- Observations shall be documented on the Qualtrics Lock/Tag/Try Field Audit Form (Appendix B).

18.1.4. **Contractor Oversight:**

- Departments overseeing contractors performing LTT activities shall conduct periodic field observations to verify contractor employees' understanding of the University's procedure, lockout concepts, and ability to follow energy control instructions.
- Observations shall be documented on the Qualtrics Lock/Tag/Try Field Audit Form (Appendix B).

18.2. Program Audit.

18.2.1. Environmental Health and Safety shall conduct a review of the written LTT Procedure annually to ensure it is being followed and that it is current with OSHA regulations. EHS shall update this procedure as necessary.

Revision History Table

History	Effective Date
Lockout / Tagout Policy Unknown revision history before 2013	January 2013
Document edited and name changed to "Lock / Tag / Try, Zero Energy Procedure"	January 2017
Updated paragraph 6 and reference to Appendix A Updated section 18 to more clearly outline audits and oversight. Added links to electronic observation form.	October 2026

UNIVERSITY OF NOTRE DAME

Appendix A
Energy Control Procedure

Department:	ND Department Name	Date of Last Revision:	January 1, 2026
Building and Location:	UND Building Name and Exact Location of Equipment	Author:	Jane Doe

Equipment Name:

This is the name or description of the equipment to be locked out.

Identifier	Energy Type & Magnitude	Lockout Location	Isolation Step	Verification
E1	240 Volt Electrical	This is the location of the energy isolation point	This describes how the energy is isolated and locked out	This describes how to test to ensure the machine will not start
E2	110 Volt Electrical			
P1	100 psi Air			

UNIVERSITY OF NOTRE DAME

Appendix B

Lock / Tag / Try Field Audit Form

Department:		**Date:**	
Person Performing Observation:		**Equipment Being Worked On:**	

Names of Authorized Employees:			

Item	Yes	No	N/A
1. Are affected employees aware of the lockout?			
2. Are all hazardous energy sources identified and isolated? Consider electrical, steam, air, etc.			
3. Is the energy control procedure accurate?			
4. Does each authorized employee have a lock and tag applied to the energy isolation points listed on the energy control procedure?			
5. Do the authorized employee(s) have possession of their lock key(s)?			
6. Are personal lockout locks of the correct type and can the authorized employee be identified by looking at the personal lock?			
7. Has zero energy state been verified and are all control switches, valves, etc. returned to the off position?			
8. Has a review occurred between the observer and the authorized employee(s) involved?			
Comments:			

Observer's Signature: _____

Appendix C

Emergency Lock Removal Form

Instructions:

This form shall be completed prior to the removal of an employee or contractor's lockout equipment.

A supervisor, either responsible for the employee who has equipment requiring emergency removal or having sufficient knowledge of the equipment or lockout shall complete this form.

A supervisor shall communicate to the authorized employee verbally or face-to-face before that authorized employee resumes work that an emergency lock removal has occurred.

The original emergency lock removal form shall be forwarded to the Environmental Healthand Safety (EHS) department for record retention of three (3) years.

Emergency Lock Removal Form		
#	**Required Information**	**Response**
1	Today's Date	
2	Name of supervisor completing Form & conducting/observing lock removal.	
3	Name of person having their personal lockout lock removed.	
4	Is this a University of Notre Dame employee?	Circle: Yes NO If NO, complete step 4a.
4a	If No, enter name of contractor company.	
5	Describe or name the equipment that lock is being removed.	
6	Describe the original reason for lockout.	
7	Provide the reason for emergency lock removal.	
8	Was the person whose lock requires removal contacted?	Circle: Yes No If No, complete step 8a.
8a	Describe attempts to locate and contact the person whose lock/tag requires removal. Example: phone number called, voice mail, email, etc.	

Required approvals before locks can be removed.

Printed Supervisor / Manager Name:_____

Signature _____ _____

Date: _____

Printed Environmental Health & Safety Name:_____

Signature _____

Date: _____

OR

Verbal Confirmation Provided by Environmental Health & Safety (EHS)

EHS Contact Name:_____

Date and Time Contacted:_____

Appendix D
University of Notre Dame
Lock / Tag / Try Hardware



American Lock (Tag NOT included, shalluse separate tag with this lock)
Part Number: A1106RED
Part Number: A1106BLU
Part Number: A1106GRN



Master Lock (Tag Included)
Part Number: 410RED
Part Number: 410GRN
Part Number: 410BLU

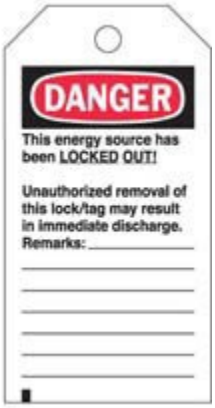






Brady Compact Lock (Tag Included)
Part Number: 143150 (Red)
Part Number: 143152 (Green)
Part Number: 143156 (Blue)





Brady Lockout Tag – Shall use with a lock
Part Number: 65520 or 66063