

LOCKOUT / TAGOUT BEST PRACTICES

Matt Dudgeon - Master Lock Safety Solutions

March 2015

SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

**Master
Lock**

Agenda

Your Questions and Comments are Always Welcome

- Lockout/tagout (LOTO) statistics
- LOTO overview
- LOTO program requirements
- Process for lockout and re-energization
- Shift changes, emergency removal
- Q & A

SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

**Master
Lock**

2

Key LOTO Statistics

Machinery doesn't care if you lose your hand or if your family loses a parent, a brother, a sister or a child.

Failure to properly control hazardous energy:

- Causes nearly 10% of serious accidents leading to an average of 24 lost work days for injury recuperation
- 248 deaths in 2012 from electrocution or being caught in running equipment or machinery*
- Thousands of serious injuries annually



*Source: Bureau of labor statistics

SAFETY SOLUTIONS

CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

**Master
Lock.**

3

Why do these accidents happen?

Main Causes of Serious Machinery Accidents

- Accidental Restarting of Equipment During Servicing or Repairs
- Failure to Stop Equipment
- Failure to Disconnect From Power Sources
 - Failure to Dissipate Residual Energy
- Failure to Clear Work Areas Before Reactivation
 - People, tools and work materials
- Insufficient Guarding of Dangerous Machinery
 - Nonexistent (or Removed)
 - Poorly Designed/Installed
 - Defeat of Presence Sensing Safety Devices
 - Interlocks, light curtains, etc.



SAFETY SOLUTIONS

CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

**Master
Lock.**

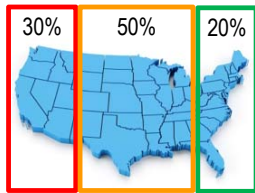
4

The OSHA Lockout/Tagout (LOTO) Standard



The OSHA LOTO Standard The Control of Hazardous Energy
CFR 29, Part 1910.147 Lockout / tag out

- Intends to prevent the *unexpected* energization or start-up of machinery and equipment, or the unintentional release of stored energy



From Master Lock's field experience with US facilities, we estimate:

- Approx. **20%** have a functioning LOTO program that meets all or most compliance requirements
- Approx. **50%** have addressed the major elements of the LOTO standard in a limited manner, but are still vulnerable to accidents
- Approx. **30%** currently have NO significant LOTO program in place

SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.



5

Lockout / Tagout continues to be cited as a Top 10 violation by OSHA

1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9
10	10	10	10	10	10	10	10	10	10	10
2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014

- As a long standing top 10 violation, there is plenty of room for improvement in lockout programs amongst U.S. employers

SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.



6

New Reporting Requirements

As of January 1, 2015, OSHA's updated reporting rule expands the list of severe injuries that all employers must self report to OSHA

- Previously, employers had to report the following to OSHA:
 - All work-related fatalities
 - Work-related hospitalizations of three or more employees
- Starting in 2015, employers will have to report the following to OSHA:
 - All work-related fatalities
 - *(within 8 hours of occurrence)*
 - All work-related inpatient hospitalizations of one or more employees
 - All work-related amputations
 - All work-related losses of an eye
 - *(within 24 hours of occurrence)*
- These type of injuries can be expected to occur from insufficient lockout tag out and/or machine guarding.



SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

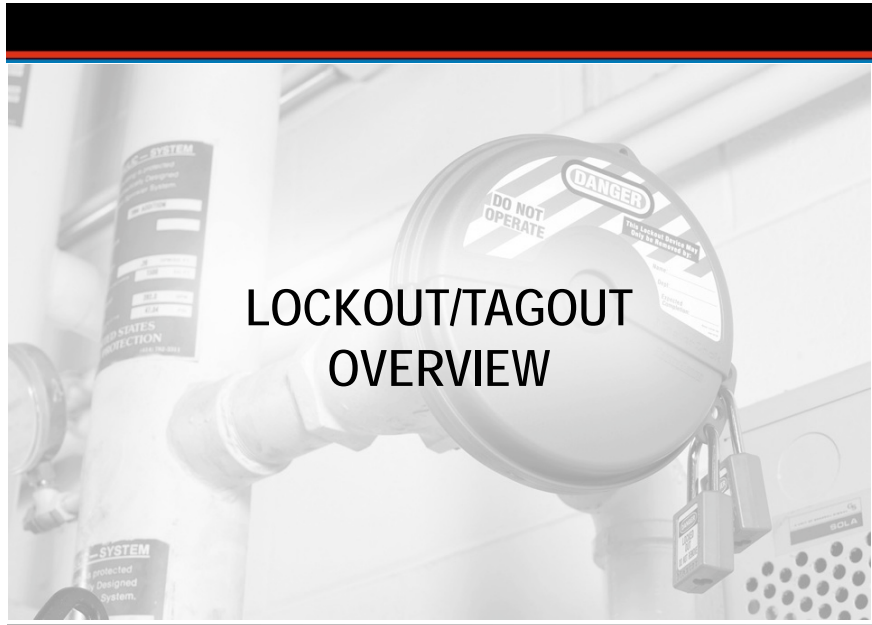
7
**Master
Lock.**

It is critical for employees to take personal responsibility for their safety



SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

8
**Master
Lock.**



LOCKOUT/TAGOUT OVERVIEW

SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.



What is Lockout Tagout?

Lockout/tagout is the process employing specific safety procedures and practices to control hazardous energy during the service and maintenance of machinery and equipment

- Protects workers from:
 - The unexpected powering or start up of machinery or equipment
 - The unexpected release of hazardous energy



SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.



When does LOTO need to be used

Generally, normal production operations are not covered by the LOTO standard. But, they are covered whenever . . .

- An employee must either remove or bypass machine guards or other safety devices, resulting in exposure to hazards
- An employee is required to place any part of his/her body:
 - In contact with the point of operation
 - Into a danger zone of a machine operating cycle.

According to the standard, servicing and maintenance of equipment is defined to include the following:

- Construction, installation, set up
- Adjusting, inspecting, modifying
- Lubricating, cleaning or jam clearing
- Making adjustments or tool changes



SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

**Master
Lock**

11

How is lockout different from tagout?

Lockout:

- Application of a secured lockout device on an energy isolating device (valve, switch etc.) per the established procedure
- Can't be removed until maintenance complete
- **OSHA: If energy isolation device is capable of being locked out, it must be locked out (unless can demonstrate tagout is just as effective).**



Tagout:

- Application of prominent warning tags on energy isolating devices instead of lockout devices
- **At least one other method of protecting personnel must also be utilized during tagout**
 - Ex: Removal of valve handle
 - Often time consuming



SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

**Master
Lock**

12

Employee Involvement In LOTO

Employees who work in an area where LOTO is utilized can be classified as either being Authorized to apply LOTO or Affected by nearby application of LOTO

Authorized Employee

- Fully trained and permitted to apply lockout or tagout control measures to machines or equipment
- Performs equipment servicing or maintenance



Affected Employee:

- Not fully trained to apply lockout control measures
- Operate machinery that is affected by maintenance or service being performed, or work in the area



SAFETY SOLUTIONS

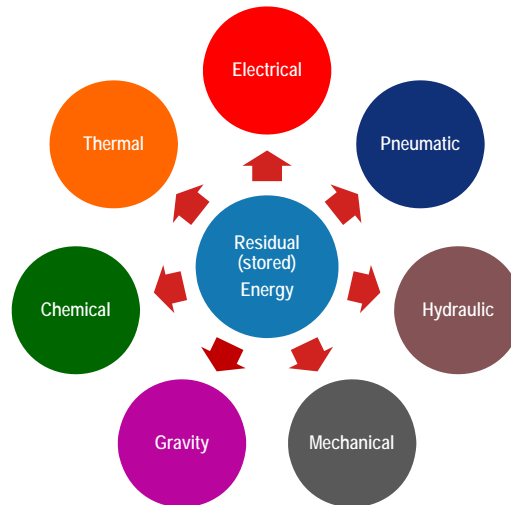
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

Master
Lock

13

Hazardous Energy Sources

Hazardous energy comes in many different forms, all of which are potentially harmful to workers



SAFETY SOLUTIONS

CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

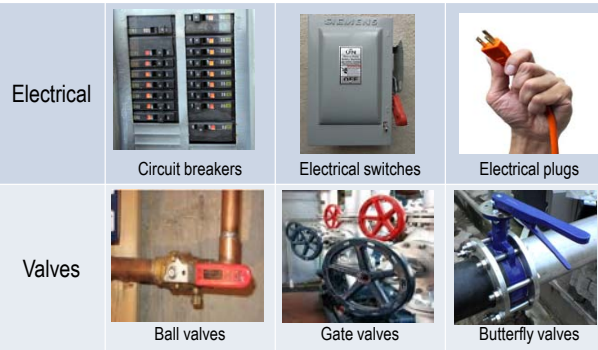
Master
Lock

14

Energy Isolation Devices

Energy isolation devices are mechanical and physically prevent the transmission or release of hazardous energy

Common energy isolation devices



- Energy isolation devices must be locked in the OFF position prior to performing servicing or maintenance

SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

**Master
Lock**

15

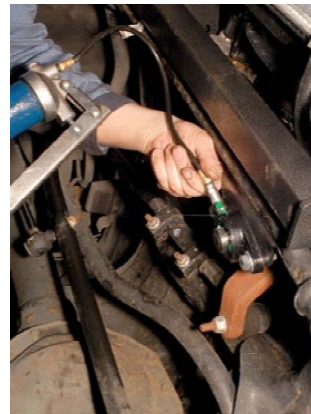
Lockout Tagout Application Exception

Limited allowances are made for:

Minor tool changes, servicing activities and adjustments do not require LOTO to be applied if they are "routine, repetitive, and integral to the use of the equipment" for production--as long as the work is performed *using alternative measures of effective protection*.

- Alternative measures must assure that the worker won't be harmed during these exceptions because a safe distance or an adequate temporary shielding method is used.
- Interlocked guards or emergency stops are not considered effective protection by themselves because they only affect control circuitry and not the actual energy sources.

BEST PRACTICE: Be conservative when determining if this allowance applies to a production task. If you are not actively supporting a productive process (i.e. not fixing a problem) and someone could get hurt, this exception clearly does not apply.



SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

**Master
Lock**

16

Cord and Plug Exception

The cord and plug exception for LOTO is only valid if:

- The cord and plug is the single energy source with no potential for stored energy.
- Only one worker is performing the servicing or maintenance and the plug remains under their exclusive control
 - Frequently the single worker and exclusive control requirements are not strictly adhered to with accidents being the common outcome



BEST PRACTICE: This exception is frequently abused, hard to monitor, and has resulted in many accidents.

If you are not actively monitoring proper use of this exception **LOTO is the best practice to use while working on cord and plug connected equipment**

SAFETY SOLUTIONS

CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

Master
Lock

17

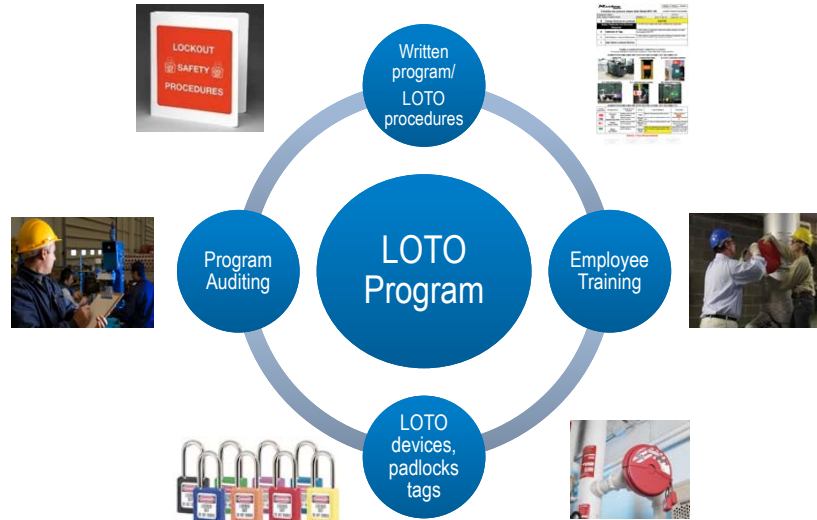
LOCKOUT TAGOUT PROGRAM REQUIREMENTS

SAFETY SOLUTIONS

CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

Master
Lock

OSHA 29 CFR 1910.147 Requirements: LOTO Program



SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

Master Lock

19

Written Hazardous Energy Control Program

Provides details of :

- Responsibilities of all participating personnel
 - Administration, Authorized, Affected employees
- Documented energy control procedures
- Method of accessing all necessary energy control equipment and hardware
- Employee training/retraining program
- Annual inspections
- May include disciplinary procedures for purposeful LOTO policy violations



BEST PRACTICE: Write your program to be a user friendly guidance and teaching tool. Use the applicable sections of your program verbatim in your Authorized and Affected personnel training and retraining.

SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

Master Lock

20

Lockout Procedures

Visual lockout procedures identify the required steps for locking out hazardous energy sources

- A machine specific lockout procedure is required for any equipment with:
 - More than one energy source
 - Unique power connections
 - A particular sequence of steps required to shut down the equipment
- Reference tool for identifying the location and process for isolating hazardous energy
 - Should be easily accessible
 - Posted at or located near each machine

Lockout Procedures

Lockout procedures should include:

- Procedural steps for shutting down, isolating, blocking and securing machines or equipment
- Procedural steps for the placement, removal and transfer of lockout devices or tagout
- Instructions for testing a machine or equipment to verify the effectiveness of lockout method

BEST PRACTICE:
 Provide easy access to procedures by posting them near the point of use

Write up a new procedure following a checklist approach prior to working on any undocumented machine

OSHA Guidelines: Lockout Devices

The OSHA Lockout Tagout standard outlines a number of compliance criteria for safety padlocks and lockout devices

Requirements per OSHA 29CFR 1910.147 standard	
Requirement	Master Lock LOTO products
Durable: Manufactured with materials that withstand usage environment	✓
Substantial: Can't be removed without excessive force	✓
Standardized: Clearly differentiates from other devices by color, shape or size	✓
Identifiable: Indicates employee that installed lockout device	✓
Exclusive for safety: Not to be used for purposes other than controlling energy	✓



- Lockout devices and padlocks must meet all criteria in order to be considered OSHA compliant

SAFETY SOLUTIONS

CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

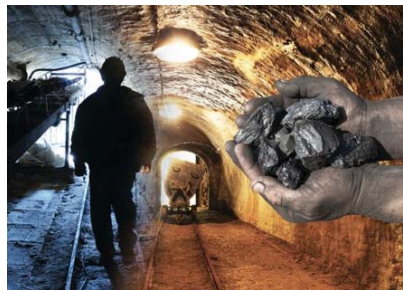
Master Lock

23

Lockout Devices Overview

Durable: Capable of withstanding the environment to which they are exposed

- Weather
 - UV
 - Wind
 - Moisture/Humidity
- Chemical
 - Industrial chemicals
- Temperature resistance
 - Extreme hot/cold



BEST PRACTICE: Request the assistance of a lockout product specialist to help assess the challenging exposures your LOTO equipment will be used in and recommend locks and LOTO devices that will stand up to your working environment.

SAFETY SOLUTIONS

CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

Master Lock

24

Lockout Devices Overview

Substantial: Can't be removed without excessive force

- Lockout devices can't be removed without the use of excessive force
 - Ex: use of bolt cutters or prying off
- Tags must withstand OSHA's 50 lb. pull force requirement
- LOTO devices are a deterrent to tampering or accidental removal, not a security device



SAFETY SOLUTIONS

CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

**Master
Lock.**

26

Lockout Devices Overview

Standardized: Clearly differentiated from other devices by color, shape or size

- Safety padlocks must be visually differentiated in style and /or color from security padlocks within a facility
 - Ensures that workers easily identify LOTO procedures



BEST PRACTICE: Using colored padlocks for LOTO clearly differentiates them from a security padlock

Pictured: A red 410 plastic safety padlock is clearly differentiated from a standard security padlock

SAFETY SOLUTIONS

CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

**Master
Lock.**

26

Lockout Devices Overview


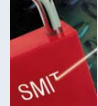
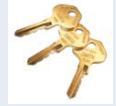
Identifiable: Indicates employee that installed lockout device

- Lockout devices must clearly identify the employee that installed the lockout device
 - Employees know who to contact with questions or issues

BEST PRACTICE:

Utilizing ID customization options on padlocks and devices clearly identifies authorized employees for a LOTO procedure

Employee ID Options

Padlock Labels	Laser Engraving	Key Stamping
		
Padlock labels include write-on and photo options	Permanently add employee name, dept. or other info to padlocks	Permanently stamp employee name, dept. or ID number to keys

SAFETY SOLUTIONS

CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

Master Lock 27

Lockout Devices Overview

Exclusive for Safety: Not to be used for purposes other than controlling energy

- Lockout devices must only be used for safety lockout
 - Using for other purposes can confuse workers and affect their ability to correctly identify when LOTO is being utilized



Pictured: An S806 cable lockout device being used to secure a ladder to prevent relocation

SAFETY SOLUTIONS

CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

Master Lock 28

Any issue with this isolation?



SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

Master
Lock

29

Any issues with this isolation?



SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

Master
Lock

30

Inspections/Audits

Regular, periodic inspections must be carried out at least annually to ensure that employees are following energy control procedures

- The intent of periodic inspections is to confirm:
 - Energy control procedures are implemented properly
 - Employees are familiar with their responsibilities
 - Deviations or procedural inadequacies are corrected
- Performed by an authorized employee who is not involved in the energy control procedure being inspected



BEST PRACTICE: Auditing is best done progressively throughout the course of the year. Break down the number of authorized personnel to be audited and divide over 9 months. That leaves 3 months to catch the ones you missed. Audit the written procedure when it is actively being used. Use the 9 mo./3 mo. strategy to have plenty of time to meet OSHA LOTO procedure audit requirements

SAFETY SOLUTIONS

CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

**Master
Lock.**

31

Employee Training and Communication

Employees must be trained so they understand the purpose and function of the LOTO program

- According to the OSHA standard, employers are responsible for providing:
 - Effective initial training
 - Certification that training has been given to all employees covered by the standard
 - Periodic retraining as necessary
- Training requirements:
 - Authorized employees: Training on the recognition of applicable hazardous energy sources, the type and magnitude of the energy, and the methods for energy isolation
 - Affected employees: Training on the purpose and use of energy control procedures
 - Other Training to identify locked out equipment in the workplace



SAFETY SOLUTIONS

CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

**Master
Lock.**

32

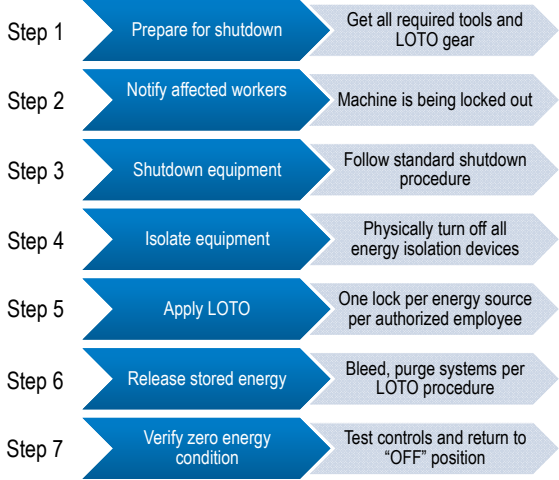


7 STEP LOTO PROCESS GROUP LOCKOUT SHIFT CHANGES

SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.



7 Step Process to Safely Lockout Machinery



SAFETY SOLUTIONS
CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.



Lockout Verification

- As an important precautionary measure, the authorized employee must check to confirm that:
 - The equipment is properly shut down
 - The energy sources have been isolated
 - Lockout and tagout devices are in place
 - Residual energy sources have been neutralized
 - Verify equipment isolation by trying to operate the machine using the normal operating control(s)
 - Metered testing of electrical circuits by qualified personnel may also be required for certain tasks
- Once zero energy condition is verified, return all tested controls to their “off” position



BEST PRACTICE: Electrical Safe Work Practices requires meter testing of electrical circuits to verify zero energy if a contact shock/burn hazard could exist. Be sure personnel who do this testing are qualified to perform this skill when working around open conductors.

SAFETY SOLUTIONS

CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

**Master
Lock.**

35

Shift or Personnel Changes

Specific procedures shall be utilized during shift or personnel changes to ensure the continuity of lockout or tagout protection

- Orderly transfer of lockout or tagout device protection between off-going and incoming employees, to minimize exposure to hazards
 - Incoming employee adds lock before off-going employee removes lock
- Notify incoming Affected Employees that lockout is in place
- Re-test all operating controls to verify energy is truly neutralized
 - Don't count on the last crew to verify your safety
 - Replace controls in off/neutral position



SAFETY SOLUTIONS

CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

**Master
Lock.**

36

Emergency Removal Requirements

Locks/Tags may only be removed by the Authorized Employee who affixed the lock/tag.

If it becomes necessary to remove a lock/tag that has inadvertently been left by an employee, the following steps must be followed:

- Notify the person's supervisor
- Ensure that the person is not on the premises
- Attempt to contact him/her at home
- Management authorizes the removal of lock/tags according to the emergency removal procedure
- Document the removal activity
- Notify the Authorized Employee prior to his/her returning to work



SAFETY SOLUTIONS

CONFIDENTIAL | M. DUDGEON | ©2014 by Master Lock Company LLC. All rights reserved. No part of this document may be shared with third parties, reproduced, transmitted or modified in any form or by any means without prior written permission of Master Lock Company LLC.

**Master
Lock**

37