Advanced Lockout-Tagout (LOTO) Presentation for VPPPA on 5/7/2014

Speaker:
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What is the true intent behind hazardous energy control (Lockout-Tagout)?

“To prevent injury or death due to unexpected restart or reenergization during service of equipment.”
Overarching Themes

Safety
Efficiency
Modern tools
Sustainability
Today’s objectives

Basics
Discovering hidden efficiencies
Optimizing safety
Techniques to sustain program
Utilization of modern technology with LOTO
Top 10 avoids with LOTO
First the basics…

- 5 components to every LOTO program (must have)
Energy Control Program – The 5 Components are...

- LOTO Training
- LOTO Procedures
- LOTO Auditing
- LOTO Equipment
- LOTO Corporate Policy
And we all know why these rules exist…

Source: Jack Benton – ehssafetynews.wordpress.com
Discovering Hidden Efficiencies
Top tips to achieve the most:

- Utilize a format that is intuitive
- Ensure the “daily use tools” are easy to utilize and quick to access.
- Ensure everyone is part of the solution by incorporating a constant improvement plan with your annual audits and refresher trainings.
Finding the **safest** approach

- **Intuitive** formats are not just for efficiency – more likely to be used.
- **Graphical** picture based procedures are **proven** to save time and improve confidence.
- **Random** audits (peer-to-peer and 3rd party mixed) ensure high quality measurements.
Expert Tips

Most employees forget to notify affected employees prior to starting their work and upon completing their work.

Important step for safety and efficiency – They need to know when they can start the process back up.

Encourage employees to take a few extra seconds when planning for the lockout-tagout process. A few seconds of planning can shave minutes off the process and help identify any discrepancies.

Always test the equipment (most important step) – If the procedure is inaccurate, remove it and notify the safety manager to have it updated & tested immediately.
Understand that LOTO is a Dynamic system with known change rate
Have one designated owner
Rely on outside experts for big updates, daily updates should be done by in house staff

Audits – People, Procedures, Policy, Product
  Include a LOTO topic in weekly/monthly meetings to hear and address user feedback.
Modernize – Utilize the best tools

Select the **RIGHT** locks/devices to ensure it’s easy.

Use **pictures** of device being utilized right at the station to reduce guess work.

Keep devices **updated**.

Utilize **electronic** formats whenever practical (iPad, smartphone, etc.).

Mount procedures at **point-of-use** using durable formats.
- Usage of **Graphical** procedures & tags
- Mount your locks/devices near where they are needed
  - Keep the devices stocked, updated and high performance (with usage pictures and training)
- Random audits throughout the year
- Electronic tablet auditing (iPad, etc.)
- Seek outside audits for **objective feedback**
Note for those with large programs...

- Avoid proprietary programs that might lock you into annual fees or the use of their program exclusively to access, create or maintain your procedures.

- Just use MS Excel™ - it has all the capability and future expandability you need:
  - Enterprise capability
  - Editing on a tablet
  - Custom programing
  - Sharing, networking, updating real time
  - Free with no annual fee
Top 10 Avoids – Common pitfalls

1. Lack of Machine Specific Procedures  
   1910.147(c)(4)

2. Lack of Training of all your employees  
   (authorized, affected, other)  1910.147(c)(7)

3. Wrong use of tags & locks 1910.147(c)(5)(ii)

4. No corporate policy

5. Working under someone else’s lock  
   1910.147(d)
6. Not identifying all energy source or adjacent equipment 1910.147(b) and (c)(4)

7. Not performing annual audits of procedures and employees 1910.147(c)(6)

8. Not understanding when to administer lockout (major vs. minor maintenance)

9. No oversight or plan for continuous improvement/review

10. Duplicate keys existing – just use bolt cutters to send the right message
• Most often issue with LOTO – Companies don’t identify the correct equipment requiring a procedure.
All 8 Criteria *Must* Be Met! CFR 1910.147(c)(4)(i)

1. Have **no potential** for stored or residual energy
2. Have 1 energy disconnect which can be **easily** isolated
3. Be completely isolated and deactivated by that **one disconnect**
4. Be **able** to be locked out during service or maintenance
5. Be able to be locked out using only **1 device**
6. Have the device under **exclusive control** of the employee for the duration of servicing
7. Be able to be serviced **without creating hazards** for other employees
8. Have **no prior accidents** due to uncontrolled energy
Does this need a procedure?

Natural Gas Boiler
What About This Machine?

Air Handler Unit
What About This Machine?

Rooftop Exhaust Fan
What About This Machine?

MIG Welder
What About This Machine?

Grinder – 120V
What About This Machine?

Electric Fork Truck
Note: All the aforementioned equipment requires a machine specific lockout-tagout procedure per the 8-criteria set forth in 1910.147(c)(4)(i)

Further information/tips (time permitting and for offline review)
Ensure the procedures stay accurate and you can prove you audited it.

- Procedures must be audited at least every 12 months (as well as authorized employees).
Maintaining your LOTO Program

- Employees must be audited annually on their use of LOTO procedures to ensure proper utilization and understanding.

- Perfect time to identify any deficiencies in LOTO procedures or overall expectations of authorized employees.

*sample audit form available on www.escservices.com

*available for download on www.escservices.com
Graphical Is Faster…

1. Find Number of Locks/Tags
2. Identify the isolation points
3. Follow Lockout Process from Top-Bottom
When procedures are installed at the point of use, authorized employees are more likely to utilize the data, they spend less time locating the correct procedure, and the mounted procedure will serve as a great tool for emergency responders in the event of an emergency.
Tip: Utilized injection molded procedures for outdoor use to yield 10+ years UV and over 150 lbs. pull force.

Use of injection molded energy isolation tags to speed the process up.
TRAININGS – Tips to ensure safety and compliancy

- **Authorized Employee**
  - Must be provided to each authorized employee prior to legally using lockout-tagout.
  - **HOT TIP**: Offer different options - 1.5 Hour, 3.5 Hour, & 8 Hour Sessions depending on the skill levels and usage of LOTO.

- **Affected Employee**
  - Awareness Training
  - Generally a 1 Hour Session

- **Annual refresher trainings are recommended**
- Review all procedures to ensure quality and safety. Fix any discrepancies immediately.
- Utilize tablets to make real-time corrections for easy fixes.
- Be prepared to install missing isolation point tags.
A good corporate policy should be **clear and easy to understand**.

Review and update the policy annually to ensure performance.

If no policy exists (or policy was lost), immediately contact ESC to receive a free policy template to start customizing today.
Utilizes QR codes at point of use

Audit LOTO program real time

50% more efficient audits

Keeps electronic records of procedure and employee audits via dashboard
TOP BENEFITS

- Identify trends you never knew before with auto-generated usage logs.
- Don’t deal with the hassles of printing documents – keep it all electronic and in the cloud.
- Proactively manage your audit dates with proper resource planning.

Important Reminder - Make sure the solution is NON-proprietary – you should always OWN your data and be able to move it to another future platform if desired.
End Of Presentation

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VPPPA Attendee: Looking for new ideas for procedures.

ESC Response: Try using graphical pictures to help enhance your existing procedures. Use the pictures as a “road map” to more quickly explain where the isolation points are for the equipment. If you already have pictures, work towards a solution that helps eliminate waste such as utilization of tablets to view/edit/access the procedures.
VPPPA Attendee: What are good solutions for record keeping and tracking audits?

ESC Response: Depending on your size, there are different approaches. If you have 100 procedures, using a simple MS Excel spreadsheet and hosting it on your server might be the best solution (and free). If you have several hundred or several thousand, you will need a robust enterprise level solution like ScanESC™ that brings all your data together and help make your program much more manageable.
VPPPA Attendee: What is good lockout-tagout software to use?

ESC Response: Any software that allows you to manage your program more effectively without trapping you into a proprietary foundation. There are several out there that are very proprietary and if you discontinue the use of the software, you will likely loose your entire investment.

ESC recommends MS Excel™ as a foundation for all procedures for stability, future proofing the program, and familiarity. ScanESC™ is a solution by ESC that leverages your MS Excel procedures to their fullest without using proprietary software that prohibits future options.
VPPPA Attendee: What are good tools to use for lockout-tagout that are new or highly rated?

ESC Response: Solutions vary depending on desired objectives. If a company wants inexpensive and universal tools, then lightweight self retracting cable devices work great for this. Master Lock, Brady, Panduit, and Zing all make very high performance devices that are geared for different needs. One new device we like is a breaker device by Panduit that just hit the market. Our tests have shown their product to hold the tightest with the least wear on the breaker. Search “Panduit breaker device” to learn more.
VPPPA Attendee: For the refining industry - what are some common pitfalls or challenges we should look out for?

ESC Response: Refining is a unique industry in that the process and product itself can pose additional safety hazards beyond the lockable energy sources. Chemical, Thermal, and Potential Energy in the form of gravity all pose grave dangers if they are not properly controlled.

The most common pitfall with LOTO systems in refining is the lack of approved processes for commodity-style equipment. Example: If heat exchangers have the same LOTO approach utilized as the piping system procedures, then there may be potential safety and compliance issues. To remedy, follow the 8 criteria to pre-write procedures for fixed equipment and review the process utilized to create “system procedures” annually to ensure safety and compliance.
VPPPA Attendee: Advanced electric motor verification steps

ESC Response: When locking out electric motors to service, it’s important to also lock out adjacent systems if they pose a hazard while servicing. For instance, in a mine if you were to service an electric motor on a large conveyor, it would be important to take steps to ensure the infeed and exit conveyors do not operate if they pose a hazard while servicing.

Common issues associated with High Voltage verification is that many contact meters are not rated high enough to verify after testing. Taking steps with “no-contact meters” that measure the electric differential within the electromagnetic waves that emit from a live circuit would be a great first step. Also, verifying at the control panel by attempting to restart.

Note: If you are about to service high voltage electrical disconnects, you must also follow NFPA 70e rules and practices that will protect you in the event of an arc flash until the circuit is known to be at zero energy state.
VPPPA Attendee: Mechanical lockout with devices vs. using tag out – when and how should you choose with is best when practicality is a concern (i.e. carrying 70 very heavy chains to lock out valves).

ESC Response: The ideal lockout-tagout solution varies depending on the industry. For a high value, but low volume industry, it might be practical to use the chains. For a high volume, high value industry (like power generation and others), it might make sense to use a lightweight cable device to secure the valves.

Tagout is no as secure as lockout+tagout together. Tagout is only permitted when there are additional steps taken to ensure an “equivalent level of protection” is established. That is a difficult concept to prove in the event of an accident.

Industry best practice – Find the best device and lock solution to meet the intended application. Work with 3rd party experts to get a plan in place and test it before implementing system-wide.
VPPPA Attendee: What are some common exceptions or alternatives to LOTO – Such as when performing minor or routine maintenance.

ESC Response: Lockout-Tagout is needed when you absolutely need no chance for unexpected startup. If you are performing diagnostic work, calibration work, programming tasks, or other tasks that are only possible when the equipment is partially energized, then protecting the employee with solutions such as SOP (Standard Operating Procedures) is one very high performance solution. A standard operating procedure must provide the equivalent level of protection as the lockout for the “intended task”. These are not referenced by OSHA, but are a critical tool to find hidden efficiencies in any safety program.
**VPPPA Attendee:** Tips for standardization.

**ESC Response:** To have an OSHA compliant program as well as one that is effective, it’s important to keep all your procedures, policies, locks/tags/devices, and general duty expectations for each safety manager as consistent as possible to ensure the integrity of the overall solution remains in tact.

One tip for this is to use a central server for accessing a common template that can be used to create the procedures. This will ensure all sites are using the same tools. For devices, it’s helpful to keep an inventory of what devices are preferred and why so that future upgrades can be made with prior historical knowledge. Lastly, for training, having all training files downloaded from a central server will help keep fresh information consistently delivered system wide.
**VPPPA Attendee:** When is it okay to use a lockbox and when is it okay to find an alternative?

**ESC Response:** OSHA doesn’t require lock boxes be used, rather that is quite often a corporate policy that will be written specifically that way for industry specific reasons and preferences. Example: Assuming no conflict with your corporate policy, if only two people are working on a piece of equipment and only two lockout points are involved, a lock box might not be the highest performance solution. Instead, opt for a hasp for ease of use and reduced components to manage.

Note: Lock boxes are great for situations when many people will be added to and removed from a lockout process. Simply applying one lock to the lock box provides the equivalent level of protection as applying a lock to each energy source saving time and reducing the wear and tear on the isolation points.
VPPPA Attendee: Train the trainer requirements – what are the minimum requirements?

ESC Response: OSHA does not list minimum requirements for knowledge, credentials, or certification a trainer must have, but instead does list the required objectives from each training. After a training is provided, all authorized employees (those applying the locks) must fully understand their roles and how to properly utilize lockout-tagout in their job to be safe.

To effectively meet the training requirements, the designated trainer should test all attendees of the training, retain the tests (with names and dates), and require retesting if the tests show lack of full comprehension. Additionally, allowing for hands on training and feedback will ensure further proof that the employees understood the training and know how to utilize daily. Annual refresher trainings are not required, but highly recommended as industry best practice.
VPPPA Attendee: Shift changes over holiday periods where certain personnel will lock it out and not return, but others must service and restart.

ESC Response: When a lock is used for LOTO, it must be applied by the person who will be protected and removed by the same person. If a piece of equipment is desired to be rendered inoperable during a transition period (i.e. shift changes, seasonal outages, prepared for demolition), then an alternative solution utilizing separate locks and tags that are not designated or marked as “lockout tagout specific” may be used to prevent damage to the equipment. Having keyed alike locks in this situation might be very beneficial for convenience.

Since locks are not required to protect equipment from equipment damage, you could also simply use a tag and zip tie if that helps achieve the objective better. Note: ensure you do not use any tags or locks that reference “lockout-tagout” or you could risk an OSHA violation.

No matter the solution and approach a company takes, The overall integrity of the system should be maintained…. “That someone’s life is being protected by this lock.”
Most safety managers we talk to agree that the concept behind hazardous energy control (Lockout-Tagout) is not that complicated.

However, finding the correct solutions that meet each industry’s and each company’s exact objectives is not an easy task.

If you have further questions, please feel free to reach out to ESC via our contact page and we’ll be happy to assist.