

Winning the LOTOrY

Effective Control of Hazardous Energies

Based on CFR §1910.147
CFR §1926.417
NFPA 70E Article 120

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Presented By

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- Regional Safety Manager at Morrow-Meadows

- Member:



- Past lives:

- Electrician and Electrical Contractor
- Thermographer
- Project Manager
- Estimator
- Safety & Technical Consultant



I. Tell. Stories.



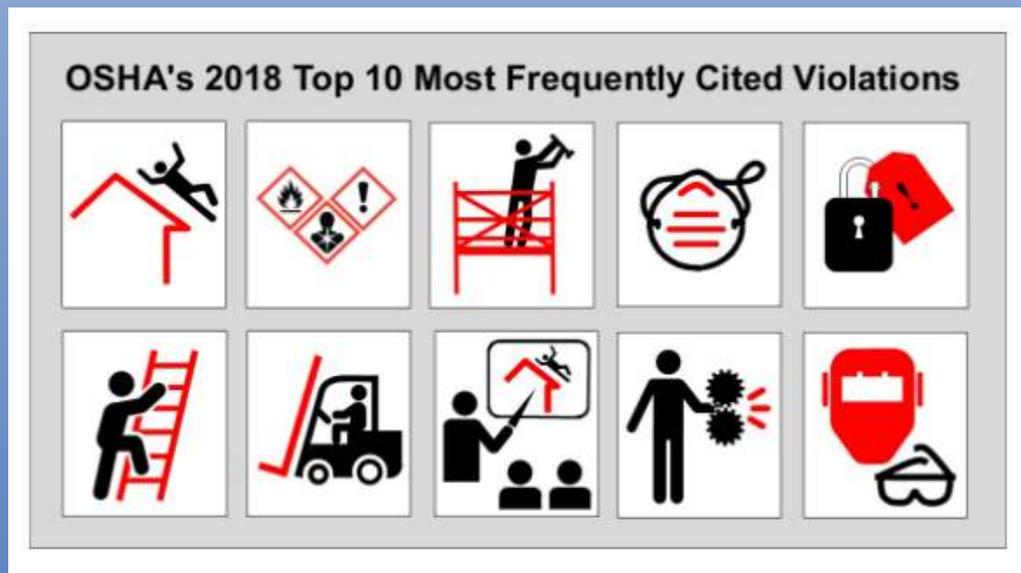
Quick Picks

- Identify greatest LOTO deficiencies
- LOTO Exceptions
- Quick Fixes
- Product “Placement”
- Inevitability of Change



OSHA's Top Ten

LOTO placed
5th in the
notorious
Top Ten



Source: United State Dept. of Labor <https://www.osha.gov/top10citedstandards>

LOTO Deficiencies

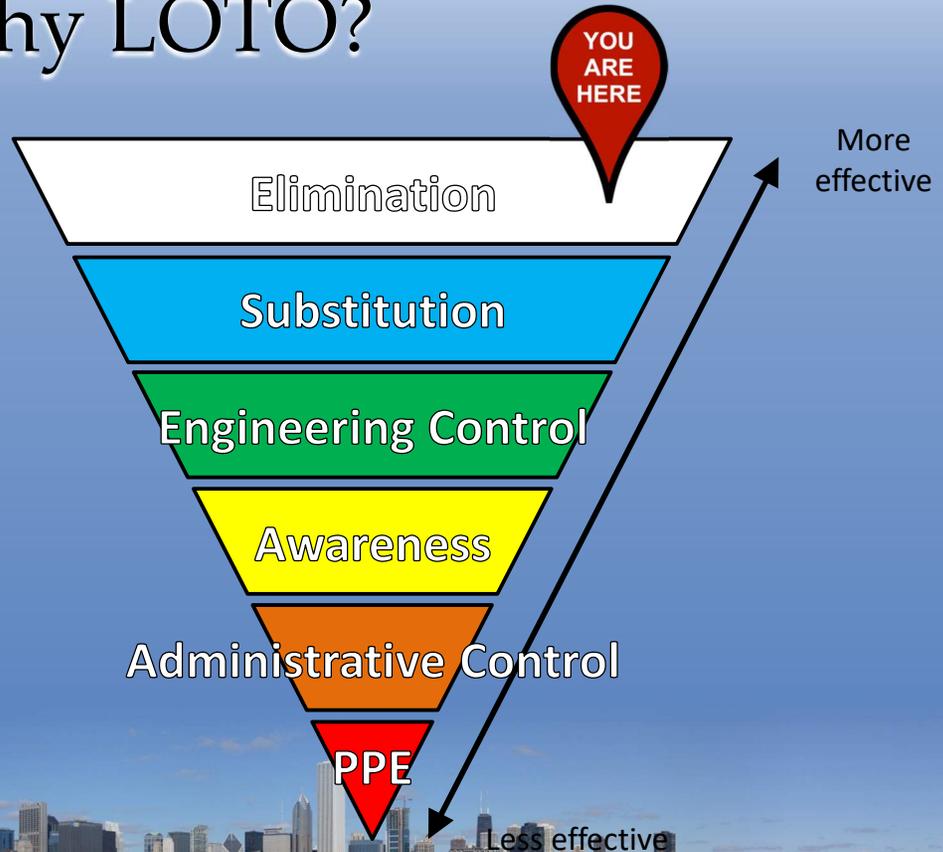
- Moved to 4th place with 2,975 citations (vs 2,923 in 2018)
- Top five sections cited – *FOUR were in 1910.147(c) General*
 - 1) 1910.147(c)(4) *Energy control procedure*
 - 2) 1910.147(c)(7) *Training and communication*
 - 3) 1910.147(c)(6) *Periodic inspection*
 - 4) 1910.147(c)(1) *Energy control program*
 - 5) 1910.147(d) *Application of control*

Reported by Kevin Druley of *Safety+Health*, November 24, 2019 <https://www.safetyandhealthmagazine.com/articles/19087-oshas-top-10-most-cited-violations>



Why LOTO?

Elimination level of Hierarchy of Controls



Electrical Exceptions

Additional or increased hazards by interrupting:

- Life support equipment
- Emergency alarms
- Hazardous location ventilation



More Electrical Exceptions

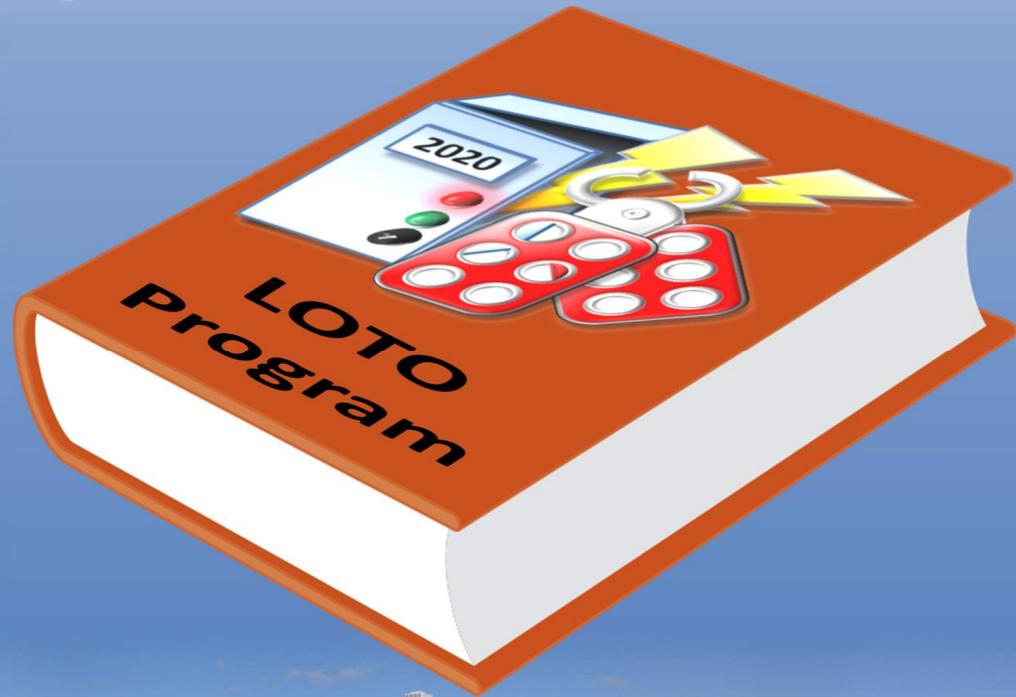
Infeasible due to equipment design or operational limitations:

- Diagnostic work or troubleshooting
- Start up or commissioning
- Part of a continuous process...*ish*



Quick Fixes

- Have a program



Quick Fixes

- Have a program
- Have procedures

Lockout-Tagout Posted Procedure

| | |
|----------------------------|--|
| ID#: CRAH-11 | Location: 1st Floor Data Center Southwest |
| Created: 6/19/2013 | Description: Computer Room Air Handler, no humidification |
| Revised: 11/19/2013 | |

3 Lockout Points

Note: Controls are located on front of machine. Local disconnect is located on front of machine.

Lockout Application

1) Notify affected personnel. 2) Properly shut down machine. 3) Isolate all energy sources. 4) Apply lockout devices, locks, & tags. 5) Test lockout devices. 6) Attempt machine startup. 7) Dissipate or discharge stored energies as necessary. 8) Verify total de-energization of all sources using live-dead-live test, opening panel covers as needed. 9) Block out any remaining mechanical sources of energy.

Standard Data Floor CRAH Unit



Distribution Panel CRAH-1



| Energy Source | Location | Method | Device |
|-----------------------------------|--|--|-------------------------|
| Electrical Primary Feed | Breaker E-1 is located in Distribution Panel CRAH-1 on the West side of the 1st Floor Data Center Southwest. | Turn Breaker to the off position and lock out. | Circuit breaker lockout |
| Water Supply | Ball Valve W-1 is located under the floor in front of the machine. | Turn Valve to the off position and lock out. | Ball valve lockout |
| Water Return | Ball Valve W-2 is located under the floor in front of the machine. | Turn Valve to the off position and lock out. | Ball valve lockout |

Lockout Removal Process

1) Inspect equipment. 2) Ensure all tools and items have been removed. 3) Blockers or restore all machine guards and panel mounts. 4) Confirm that all employees are safely locked. 5) Verify that controls are in neutral. 6) Notify affected employees that machine will be re-energized. 7) Remove any lockout and lockout devices. 8) Re-energize machine following start-up procedures. 9) Perform any required operational tests.

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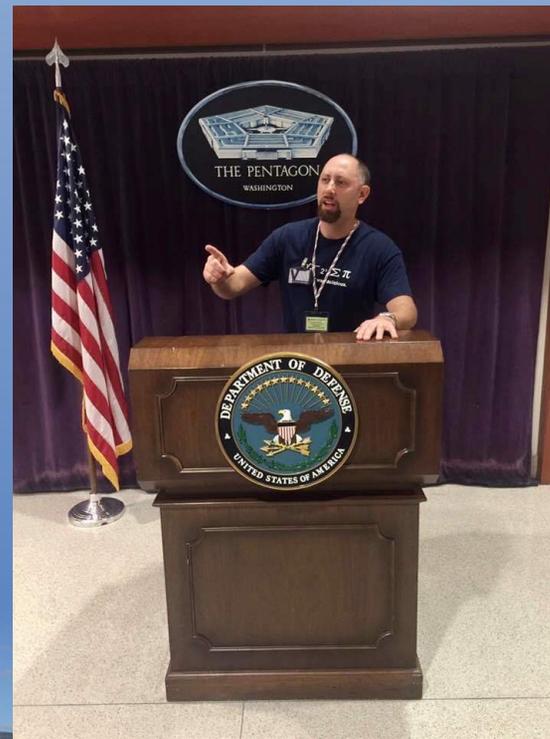
Quick Fixes

- Have a program
- Have procedures
- Perform inspections



Quick Fixes

- Have a program
- Have procedures
- Perform inspections
- Hold training/provide awareness



What's Next?

- Those broad strokes address the first four
- Managing the rest takes creativity



Recognizing Exposure

Affected Employee(s):

- Normally operates machine being serviced
- Works in the area where maintenance is being performed



Driver

Authorized Employee(s):

- Trained and authorized by the company
- Responsible for and in control of LOTO of equipment in order to perform maintenance



Crew

Look at Stored Energy

How many stored energies are present?



Energy Sources



Energy Sources

- Electrical
- Steam
- Thermal
- Pneumatic
- Mechanical
- Gravity
- Chemical
- Hydraulic
- Pressurized Water



Recognize Potential

*The Story of the
AwesomeSaw and the
Common Garage*



Compensate for Others

*The Story of the
Ceiling Fan and the
Careless Roommate*



Problem Attitudes

The Story of the Impatient General Contractor and the...well, really that was it.



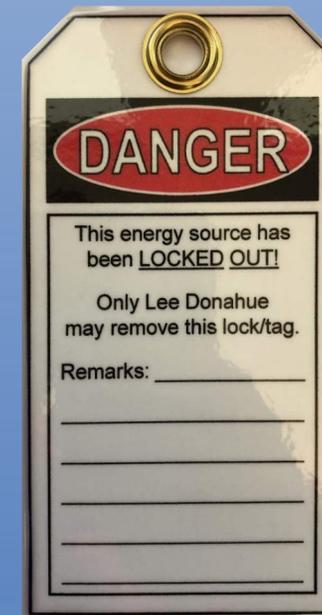
Problem Attitudes

Tag MUST indicate:

- DANGER: Do Not Operate
- Worker's name
- Date applied

Bonus points:

- Contact information
- Expected restoration date
- Photo of worker



Circuit Breaker Application

*The Story of
"We Can't
Lock It Out"*



Tricky Situations

How many locks can be applied to a hasp?

FIVE.

Cannot prevent worker #6 from applying a lock!



More Trickery – Using E-Stops

Emergency stops are not acceptable as sole means of lock-out.

This is currently being revisited:

- Newer equipment specifications
- Increase of robotic operations



OSHA Thinks It Over...

OSHA Requests Information on Possible Updates to the Lockout/Tagout Standard

May 17, 2019

Washington DC – The U.S.

Department of Labor’s Occupational Safety and Health Administration (OSHA) is requesting information on a possible update to the Control of Hazardous Energy (Lockout/Tagout (LOTO)) standard. The Agency is interested in comments on the use of control circuit-type devices to isolate energy, as well as the evolving technology for robotics.

OSHA is requesting information about

how employers have been using control circuit devices, including information about the types of circuitry and safety procedures being used; limitations of their use, to determine under what other conditions control circuit-type devices could be used safely; new risks of worker exposure to hazardous energy as a result of increased interaction with robots; and whether the agency should consider changes to the LOTO standard that would address these new risks.

The current LOTO standard, published in 1989, requires that all sources of energy be controlled during servicing

and maintenance of machines and equipment using an energy-isolating device. The standard specifies that control circuit devices cannot be used as energy-isolating devices, but the agency recognizes recent technological advances may have improved the safety of control circuit-type devices.

Comments must be submitted on or before August 18, 2019. Comments and materials may be submitted electronically at <http://www.regulations.gov>, the Federal e-Rulemaking Portal, or by facsimile or mail. See the [Federal Register notice](#) for submission details.

Products

Something
for
Everything



Collect Your Winnings

- The major transgressions are administrative
- The finer points are trickier:
 - Attitude is a major factor
 - Energy is everywhere
 - Specific examples can lead to broader behaviors
- Everything has a solution





Thank You!

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