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Lockout Tagout

*LOTO

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What is Hazardous Energy?

Energy sources that include electrical, mechanical, hydraulic, pneumatic, chemical, thermal or other energies that can be hazardous to workers

If someone is working on a machine that contains hazardous energy, and that energy is suddenly released, it can be hazardous or fatal to the worker(s)

So what can be done about it?

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What can we do about it?

We have developed a method to prevent workplace injury caused by hazardous energy:

Lockout Tagout (LOTO) procedures prevent accidental release of hazardous energy by making sure that the equipment is no longer storing that energy and cannot be operated while repairs are being made

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What is LOTO?

- Puts physical blocks for operation of equipment so that it cannot be operated while someone is working on it

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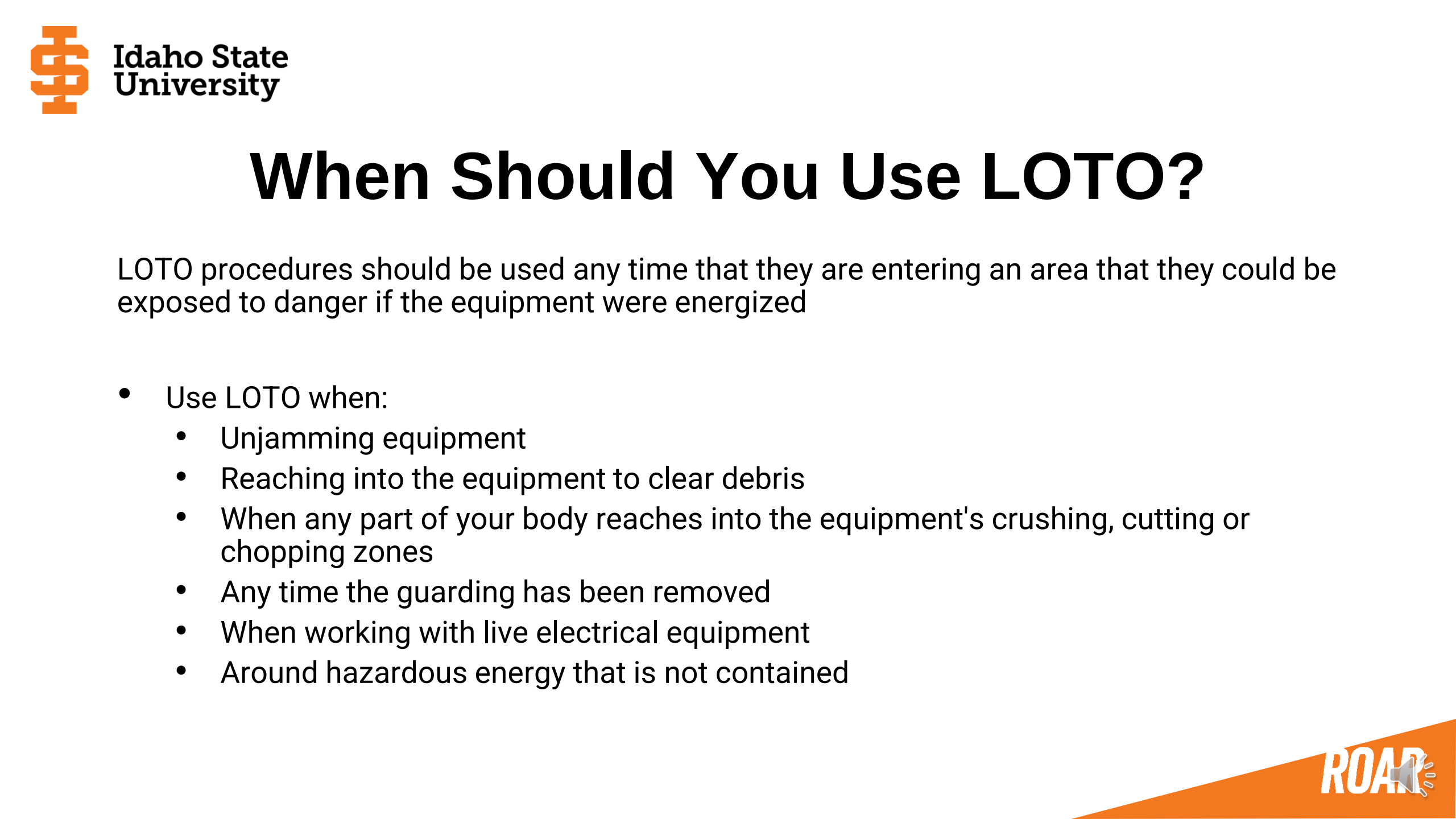
When Should You Use LOTO?

LOTO procedures should be used any time that they are entering an area that they could be exposed to danger if the equipment were energized

- Use LOTO when:
  - Unjamming equipment
  - Reaching into the equipment to clear debris
  - When any part of your body reaches into the equipment's crushing, cutting or chopping zones
  - Any time the guarding has been removed
  - When working with live electrical equipment
  - Around hazardous energy that is not contained



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Locks

- Locks can come in many different colors (most common is red)
- Locks will be combination or have keys
- Provide physical barrier to prevent operation
- Will only have one key!
  - This key is in the possession of the person doing the work at all times
  - At no point is anyone else allowed to cut or remove the lock (your company might have exceptions for supervisors when the person is confirmed off shift and/or cannot be reached)

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Requirements for Locks

1. All padlocks utilized must be manufactured for the sole purpose of lockout. Regular padlocks are not permitted
2. LOTO locks must not be used for any other purpose than LOTO
3. All lockout padlocks should have a label with the authorized individual who owns the lock
4. Only one key is permitted per lockout lock that takes keys. This key is to remain in the possession of the owner at all times.
   - There is an exception for locks that are combination
5. Must be standardized throughout the facility to make them recognizable
6. Provided by the employer

OSHA 29 CFR 1910.147

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Example of an Approved Lockout Padlock:

Example of a Standard Padlock
Not Permitted for Lockout:

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Knowledge Check 1

- True or False: Red is the required color for LOTO locks

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Knowledge Check 1

- False: Red is a common color but not a required color

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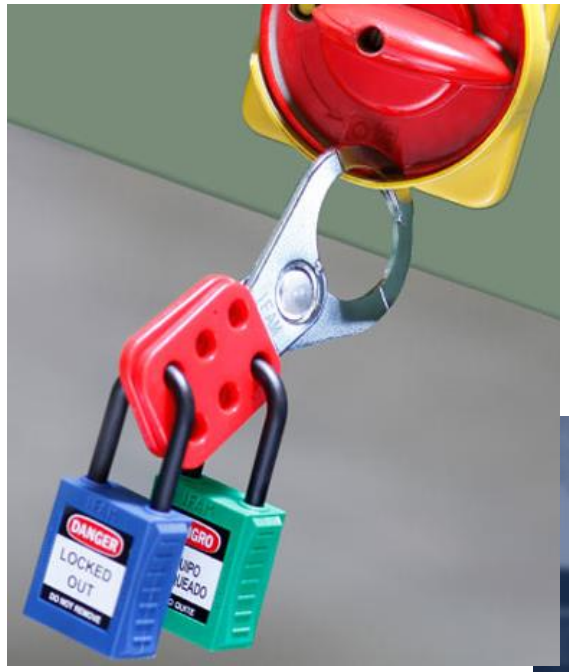
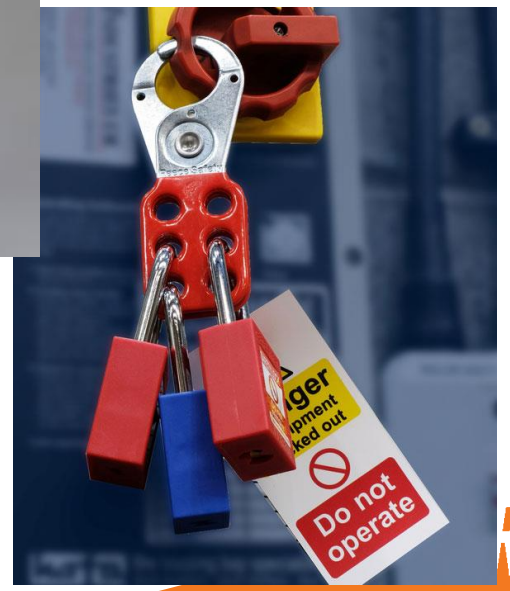
Multi-Person Jobs

Any time there is more than one person on a job there needs to be more than one lock

- This prevents accidental energy release while one person might still be working on the machine

They make multi-lock devices called “hasps” that allow you to hang more than one lock on a smaller area





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Multi-Person Jobs

If there are too many people working on one job even for a hasp, a supervisor, work lead or foreman can apply one lock and put the key to that lock in a “lockbox” where other employees will place their locks on

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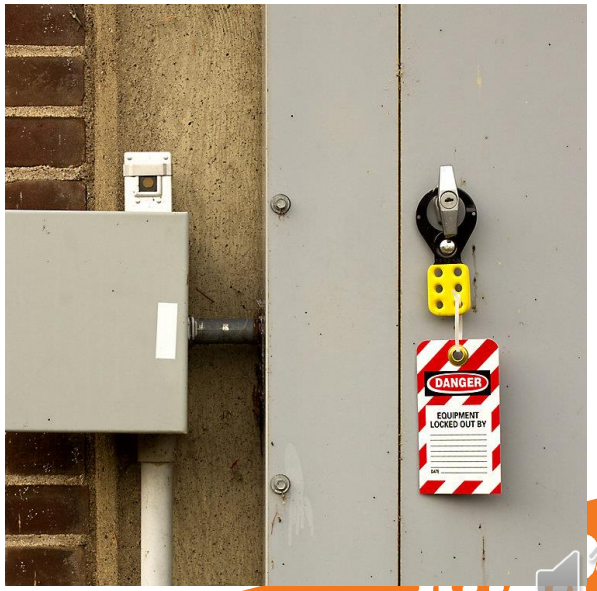
Tags

- Sometimes used in conjunction with locks to specify the work
- Can be used as a last resort if the item cannot be locked out for any reason
- Can be easily ignored
- Per OSHA 1910.147, if tags are to be used, the employer must demonstrate that the tagout program will provide the same level of safety as using a lock



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Locks and Tags

These things need to be DURABLE and able to withstand the environment they are in

That means:

- They will not corrode, or the ink will not run or fade on tags (they need to be legible)
- They need to be strong enough to not be removed by normal means (you won't be able to pull them off)

They need to be inspected regularly to make sure that they are still in good working order AND need to be replaced if they are no longer legible (tags) or are damaged (locks and tags)

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LOTO Employee Classifications

- **Authorized:** The person adding or removing energy control devices to a system
  - Authorized employees receive special training that help them identify the hazards associated with their work and how to effectively isolate and control hazardous energy

- **Affected:** Employees directly affected by the equipment being inoperable
  - Affected employees only need to be able to recognize when energy control procedures are being used and understand that they should not attempt to remove or start any equipment with these controls in place. **NOT** AUTHORIZED TO ADD OR REMOVE ENERGY CONTROL DEVICES

- **Other:** Employees that may/ may not be affected by the equipment being inoperable
  - Employees should still understand that energy control measures are being used and not try to operate the equipment

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Authorized Employees

- Authorized employees are the people who add or remove the LOTO equipment from systems

- They receive specialized training from their employer in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace and the methods and means necessary for energy isolation and control

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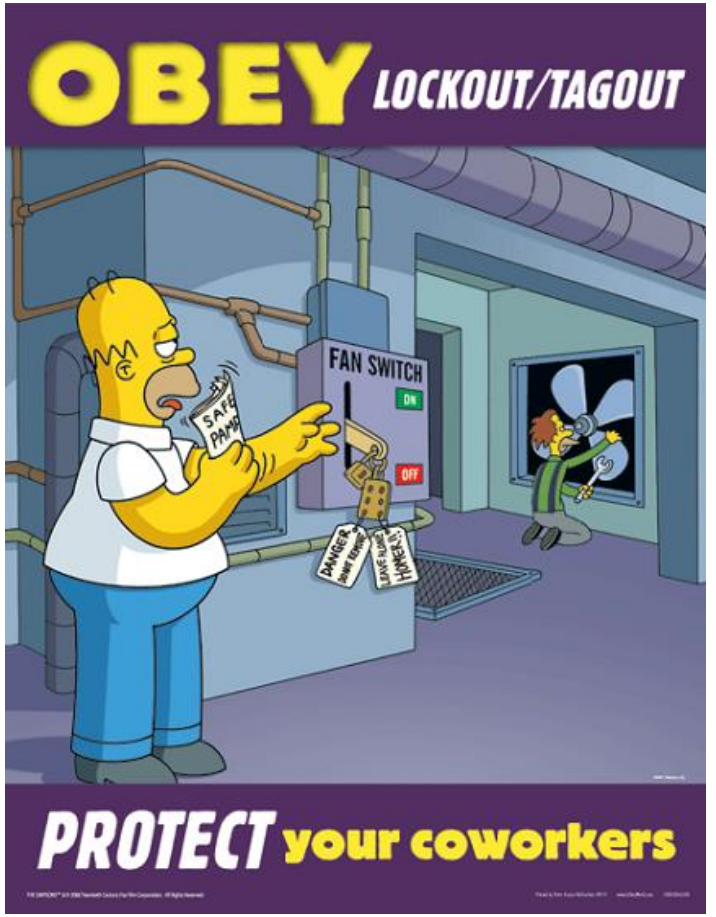
Everyone Else

- Affected employees and other employees must be aware of the LOTO procedures in the workplace to protect the people doing the work
- They are not authorized to remove or operate equipment that has been locked out
- Even if a person is an authorized employee and not working on the current project, it is important to not remove those safeguards



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LOTO, Your Employer and You

- OSHA 29 CFR 1910.147 outlines LOTO procedures
- Employers might have their own procedure for locking out / tagging out equipment but there are some steps that they should include in their procedure
- It is important to use LOTO procedures! They are there to keep you safe!
- **Don’t allow “schedule” or “production” pressure rush you into not using LOTO practices!**

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Knowledge Check 2

- True or False: Locks are allowed to have multiple keys provided that one goes to the owner of the lock and the other goes to the supervisor

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Knowledge Check 2

- False: Locks are only allowed to have ONE key. It should be in the possession of the owner of the lock at all times

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LOTO Procedures

1. Step 1: Prepare
2. Step 2: Notify
3. Step 3: Shut Down
4. Step 4: Isolate
5. Step 5: Apply LOTO Equipment
6. Step 6: Release/ Control Stored Energy
7. Step 7: Verify
    1. 7A: Live – Dead – Live for electrical verification
8. Step 8: Maintain
9. Step 9: Restore

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Step 1: Prepare

- Prepare yourself and your team for the shutdown.

- Talk about what hazardous energies might be present and how to mitigate risk or if it is a solo job, take the time to identify potential hazards to yourself
- You might be dealing with many hazardous energy sources, be sure to identify them all!

- Job hazard analyses help identify potential risks

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Step 2: Notify Affected Employees

- Notify anyone in the area or who works with the equipment of the impending shutdown
- This could include people like
  - Operators
  - Supervisors
  - People working down the line

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Step 3: Shut Down

- Shut down the equipment in accordance with the manufacturers specifications or your company procedure and should always be done in a safe, orderly manner

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Step 4: Isolate

- Isolate the energy sources by turning off a breaker, switch or turning a valve. Prevent any new energy from entering the system you are working on

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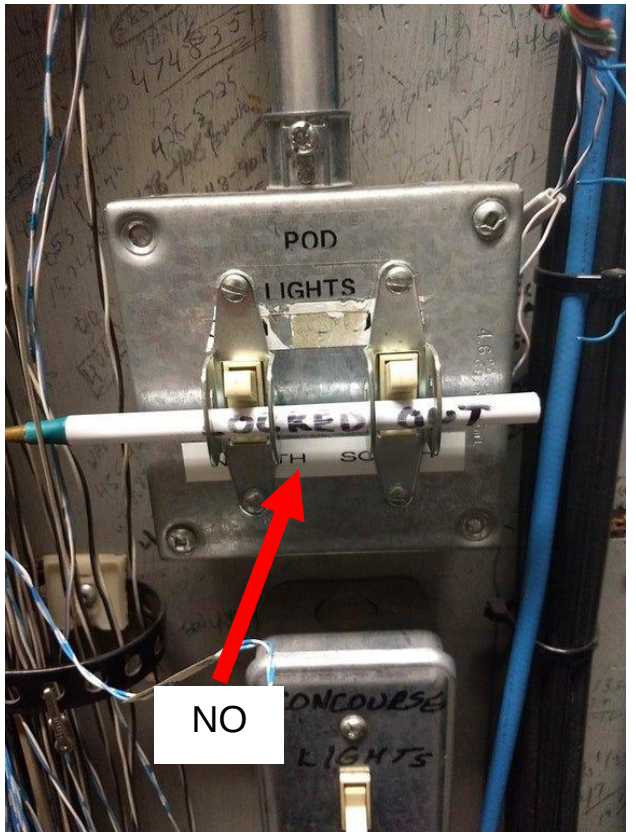
Step 5: Apply LOTO Equipment

- Authorized employees need to apply LOTO equipment to the control for the energy sources. This can be a valve guard, circuit breaker guard, electrical switch guard, etc. Each authorized employee needs to apply their own lock if it is a multi person job to prevent people from accidently starting the equipment

- Again: be sure to apply LOTO equipment to all potential hazard sources!



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Step 6: Release/ Control Stored Energy

- Release or control all additional stored energy in the system.

- If the system is pressurized, you might have to bleed off existing pressure or if it was a heated system you might have to wait for it to cool. If the system has capacitors, be sure to use an approved shorting method to release stored electrical energy if required

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Step 7: Verify

- This is probably the most important step – verify the lockout

- You can do this multiple different ways
- Check with a multimeter if it is an electrical system (do a live – dead – live verification)
- Try to start the process with the start button or switch
- Check the pressure gages and open a bleeder valve all the way and verify there is no pressure

- **REMEMBER: you might be working around multiple hazardous energy sources. Be sure to verify that all sources are in a non harmful state!**

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Step 7A: Verify (multimeters)

- Live – Dead – Live Test
- Verify your multimeter is working by checking the voltage in a known live low voltage circuit (wall outlet for example)
- Check the voltage equipment you are working on (remember to check all phases if it is 3 phase) and verify that it is dead
- Recheck your multimeter on a known live circuit to verify that it is still in working condition

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Step 8: Maintain

- Maintain the lockout until the job is completed.
- If testing of the equipment is required, it is important to verify that all personnel working on the job have been cleared before starting the equipment (this is why we use multiple locks)
- It is important to re apply LOTO equipment after testing has been completed if there is still maintenance to be done

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Testing the Equipment

Procedures for testing the equipment in the midst of repair

1. Clear the machine of tools and materials that could become hazardous
2. Remove employees from the machine or equipment area
3. Remove the LOTO device
4. Test the equipment but proceed with caution regarding positioning of employees to prevent accidental injury
5. Once testing is complete, be sure to re-apply the LOTO equipment before further repairs are made
6. Reverify that the system is inoperable

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Step 9: Restore Energy

- Restore energy back to the system only after everyone has removed their locks and a verbal warning has been given to all authorized and affected employees that the equipment will be starting up again. All guarding that was on the equipment must be restored

- Only the people who applied the LOTO equipment are allowed to remove it. Everyone needs to remove their own lock unless your facility has written procedures to allow removal by anyone else

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Knowledge Check 3

- How is a live – dead – live verification performed?

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Knowledge Check 3

- First you check your multimeter against a live source to verify operation of the multimeter, then check the equipment that should be dead to verify that the circuit is not live, then re check your multimeter against a live source to verify operation

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Special Conditions: Energy Reaccumulating

If there is a possibility of the reaccumulating stored energy to a hazardous level, it is important to continue to verify that the system is still safe to work on periodically

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Special Conditions: Device Removal

Per 1910.147 (e)(3) –

- When an authorized employee who applied the LOTO device is not available to remove it, that device may be removed under direction of the employer provided that specific procedures, documentation and training have been developed beforehand and shall include
  - Verification that the employee is not at the facility
  - Making reasonable efforts to contact the employee to inform them that their device has been/ will be removed
  - Ensuring that the employee has the knowledge that their device has been removed upon return to the facility

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Special Conditions: Outside Personnel

- Whenever outside servicing personnel are working within your facility, they need to be made aware of all LOTO procedures in your facility and they should make you aware of theirs

- If the outside employer needs to lock something out, it is important to comply with their LOTO procedures

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Special Conditions: Shift Change

- Specific procedures shall be utilized during shift or personnel changes to ensure that the equipment remains in a safe condition. There should be an orderly transfer of lockout or tagout equipment to prevent accidental energization. There should also be verbal or written communication to make the transition process successful

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Why LOTO is Important!

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End of Show

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