Employee Safety

Most Dangerous Job in Manufacturing? Maintenance—Look to OSHA Top 10 for Safety Pointers

Vanessa Jo Roberts | Feb 20, 2020

The maintenance team puts itself at risk to reduce hazards for everyone in a facility. It's equally important to protect these workers from harm. OSHA's Top 10 list can help guide you.

When it comes to dangers across the manufacturing shop floor, there are many—keeping safety teams and government inspectors busy with programs and guidance to protect workers from harm.

But clearly one of the most dangerous roles falls to the workers tasked with maintaining machines—even though a chief purpose of maintenance is to reduce hazards and risks in a manufacturing facility.

"Good maintenance and repair procedures contribute significantly to the safety of the maintenance crew as well as that of machine operators," explains the Occupational Safety and Health Administration in its ***guidance on machinery maintenance and repair***.

"The variety and complexity of machines to be serviced, the hazards associated with their power sources, the special dangers that may be present during machine breakdown, and the severe time constraints often placed on maintenance personnel," OSHA continues, "all make safe maintenance and repair work difficult."

In a small shop, this work might fall to each machinist or a select group of machinists, but in a large business there often are maintenance technicians and teams who do only that. Either way, this particular job is highly dangerous.

It's risky because the work requires closeness to the machine.

"During normal operation, automation typically diminishes the likelihood of human error that can lead to accidents," points out the ***Health & Safety Authority***. "In maintenance activities, contrary to normal operation, direct contact between the worker and machine cannot be reduced substantially—maintenance is an activity where workers need to be in close contact with processes."

Comparatively speaking, according to the ***Bureau of Labor Statistics***, jobs in this category have "one of the highest rates of absences due to work-related injuries and illnesses." The incidence rates for trunk, hand and head injuries tend to be nearly twice the comparable rates for all workers, the BLS reports.

4 Lockout/Tagout Best Practices

It's too easy to be hurt when performing maintenance, so regularly evaluate and tweak your ***lockout/tagout program*** to keep it current and avoid safety hazards.

Here are four best practices to follow, according to Todd Grover, global senior manager, applied safety solutions, at Master Lock:

1. Start with a good lockout program.

2. Make timely updates.

3. Verify by effective physical application and testing.

4. Deploy lockout equipment in lean fashion.

For all the details on these tips, read our "Preventing Safety Hazards with Effective Lockout/Tagout Programs."

A look at the ***OSHA top 10 violations for 2019*** might explain why: Seven of the most cited regulations come into play during machine maintenance. Clearly, the first and fourth most prevalent items on the list, preventing falls and ensuring appropriate lockout/tagout procedures, are critical.

No. 1: Fall Protection (CFR *1926.501*)

Maintenance often involves scaling equipment so the appropriate use of ***harnesses***, anchors and personal protective equipment (such as hard hats and gloves) are regular items used by these workers.

Possible money-saving approach: If you have machinery and systems that require regular inspections and maintenance at height, then you might want to rethink your approach to fall protection safety, suggests JoAnn Dankert, senior safety consultant at the National Safety Council, in an ***article in Safety and Health magazine***.

"In some situations, it may be beneficial to forgo using personal fall protection equipment and instead build a platform with standard railings and a swing gate in front of a fixed ladder. Although such a platform costs money, Dankert said, it may be less costly than creating a fall protection plan, buying the PPE, and training and re-training employees."

One way to determine the right approach for your shop floor might be to use the ***Hierarchy of Controls*** from the National Institute for Occupational Safety and Health (NIOSH). Based on the idea of "prevention through design," the heirarchy can help you define your fall safety needs across a spectrum, from least effective to most effective. (*Read more about PtD* ***here***.)

No. 4: Lockout/Tagout (CFR *1910.147*)

Lockout/tagout, the practice of controlling the potential for hazardous energy release, is a priority best practice for maintenance.

Creating a clear lockout/tagout procedure is Step 1. Most facilities do create LOTO procedures, says Namir George, manager of international consulting services at NSC, in the Safety and Health article.

The problem is that many fail to adequately implement these procedures, he says. George cites three common reasons for violations of company lockout/tagout procedures: complacency, a rush to finish the work and unfamiliarity with the equipment.

The Need for Lockout Tagout

Dangerous electrical energy can easily be stored in machining operations—so proper lockout tagout processes, devices and adequate training are needed to help keep workers safe from harm. Tagging is very important to visually show workers that a machine's operation status has been communicated and is clearly labeled—but locking is essential to making sure the machine's power and energy cannot be bypassed by service teams—and can only be handled by authorized workers. Take a look at some of the most important recent information on lockout tagout.

OSHA STANDARD 29 CFR 1910.147

It's a Top 10 OSHA Violation

In 2017: OSHA Top 10 Rank

#5

3,131 Violations

2,877 Citations

Top 4 Lockout / Tagout OSHA Citations

1 STANDARD 1910.147(C)(6)(I):
Procedures shall be developed, documented, and utilized for the control of potentially hazardous energy.

Citations: 621

2 STANDARD 1910.147(C)(1):
The employer shall establish a program consisting of energy control procedures . . . the machine or equipment shall be isolated from the energy source and rendered inoperative.

Citations: 373

3 STANDARD 1910.147(C)(7)(I):
The employer shall provide training to ensure that the purpose and function of the energy control program are understood by the employees.

Citations: 288

4 STANDARD 1910.147(D):
Affected employees shall be notified by the employer or authorized employee of the application and removal of lockout devices.

Citations: 79

3 Examples of Company Fines: 2017

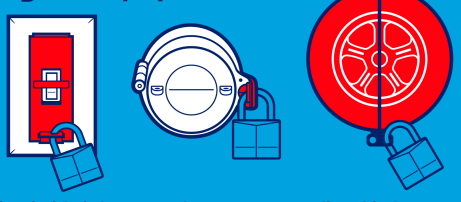
Automotive Manufacturer Mansfield, Ohio	Inspection Cause: Amputation, Machine Injuries	Total Fines: $536,249
Animal Feed Manufacturer West Point, Nebraska	Inspection Cause: Fatality	Total Fines: $526,633
Container Manufacturer Chicago, Illinois	Inspection Cause: Injuries	Total Fines: $503,380

Machine Guarding vs. Lockout Tagout

Machine guarding provisions cover most production operations, however workers performing maintenance during operations must follow lockout tagout procedures if they:

- Remove or bypass machine guards or other safety device
- Place any part of their bodies in or near a machine's point of operation
- Place any part of their bodies in a danger zone of machines

3 Examples of Lockout Tagout Equipment



Electrical Switch Lockout

Push Button Lockout

Adjustable Gate Valve Lockout

SOURCES: Safety+Health Magazine, 2017; National Safety Council, 2017; Convergence Training, 2017; National Marker Company, 2018.

But what about those other five OSHA regulations?

No. 3: Scaffolding (CFR *1926.451*) & No. 6: Ladders (CFR *1926.1053*)

These two go hand in hand with the No. 1 OSHA violation, fall protection. The use of scaffolding and ladders is commonplace in maintenance work to scale machines and repair hard-to-reach components.

No. 9: Machine Guarding (CFR *1910.212*)

This one nearly goes without saying since often maintenance must take place when machinery is running—at minimum to diagnose the need and then to check the system once servicing is complete.

"Injuries involving machinery or equipment often result in death or permanent disability," OSHA notes in recent ***instruction for the National Emphasis Program on Amputations in Manufacturing Industries***. "OSHA's enforcement history shows that employees performing servicing and maintenance on machinery or equipment are often injured when no machine guarding is present."

Get pointers in our "OSHA Machine Guarding Checklist: Retrofit and Customize Your Guards."

No. 8: Fall Protection Training

Providing fall protection training is as critical as ensuring your maintenance team has adequate fall protection systems, equipment and PPE, says MSC Safety Specialist Damon Cassell, who *likes to say* that "commonsense is often not common."

OSHA's fall protection training regulation is relatively new compared to many of its regulations—dating just to 2017. But as fall protection has continued to be the most prevalent violation, the agency increasingly has focused on training during its inspections with the hope of reducing injuries and deaths from workplace falls.

When it comes to fall protection, ***OSHA recommends*** that businesses "train workers about job hazards in a language that they can understand." (*Find additional advice in "**5 Must-Know Tips for Fall Protection Training**."*)

No. 10: Eye and Face Protection (CFR *1926.102*)

Given that the BLS statistics note that head injuries occur frequently for workers in maintenance jobs, the need for eye and face PPE makes sense. Both manufacturing and maintenance make the ***government's list*** for jobs with a high risk of eye injuries.

Often maintenance workers must get up close to sharp tools and machinery, as well as expose themselves to chemicals and machining fluid. This eye, face and head ***PPE checklist*** for the oil and gas industry can serve double duty as guidance for maintenance teams.

NIOSH recommends that not only should all businesses provide appropriate PPE for ***eye protection***, but they should also conduct eye hazard assessments.

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Safety Culture's Effect on Maintenance in Manufacturing

Safety culture within your organization definitely affects the welfare of your maintenance team. As Dale Ekmark, a maintenance safety consultant, points out in an ***EHS Online article***, it's important that leaders "consistently convey the right message."

He also recommends that businesses emphasize planning and scheduling their maintenance whenever possible. "Maintenance that is planned and scheduled is by nature less risky than middle-of-the-night emergency repairs."

What's more, making every effort to ensure the safety of your maintenance team can save your business on what it might spend on compensation claims. BLS says that for the maintenance category, compensation costs are much higher than for all other occupations.

What tips can you share about improving safety for your maintenance workers?