

How to Develop An Effective Machine Guarding Program.

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Learning Objectives For This Session

- Introduction - History of machine safeguarding
- When did this issue start?
- Is this a new issue?
- Can you purchase a safe machine?
- What you need to do for the future.
- How to build an effective machine guarding program.

Introduction

- **How Many Of You Are Into Safety Of Your Family And Your Fellow Workers?**
- **Have You Done This?**
- **The Elevator Scenario?**



My Question To All Of You Is This !

- Have all of your purchasing department, your design engineers, your managers, your supervisors, your maintenance personnel and your machine operators been properly trained in the ANSI, NFPA, NEC, OSHA, specific machine owners / operators manuals for that piece of equipment?
- It is either yes or no question!
- If not, your company will never achieve having an effective machine guarding program. Safety of machine guarding starts with understanding these documents.

My Question To All Of You Is This !

- When I conduct expert witness work for the injured person, I win 98 percent of my cases,
- WHY? because the employer failed to do this specific training on each type of machine.
- If you or the others just read the OSHA standards, then you have not been properly educated on that particular machine nor can anyone build an effective program.

Introduction

- Please write this down “It is either safe or it is unsafe and Safety has NO sides.”
- And “If it is unsafe, why would anyone allow a person to operate an unsafe machine without building a **safe work procedure** to protect the employee until some corrective action is put in place”.

Introduction

- A **safe work procedure** (SWP) is an integral part of the risk management process as it outlines the hazards, risks and associated controls measures to be applied to ensure the task/activity is conducted in a way to reduce the risk of injury.
- Therefore a SWP is considered an administrative control, and should only be adopted once all other types of controls (i.e. elimination, substitution, isolation and engineering) have been considered.

Safe Work Procedure (cont)

- **Safe Work Procedure (SWP's)** provide information to assist management and workers on how to perform tasks safely. They include:
 - Describing how the work is to be carried out.
 - Identifying the work activities assessed as having safety, health or environmental risks identified.
 - Stating what the safety and environmental risks are.

Safe Work Procedure (cont)

- Describing the control measures that will be applied to the work activities.
- Describing how measures will be implemented to undertake the work in a safe, health and environmentally sound manner.
- Outlines the legislation, standards and codes to be complied with and,

Safe Work Procedure (cont)

- Describing the equipment used in the work, the qualifications of the personnel undertaking the work and the training required to undertake the work in a safe manner.
- **Safe Work Procedure (SWPs)** relate specifically to keeping the worker / person undertaking the work safe and until a permanent fix to the hazard can be corrected and eliminated.

Introduction

- So if you find safety, health or environmental hazards occurring on the factory floor, then this is a sign of a **management system failure**.
- I am not saying that management is failing but what I am saying is the managing of the safety, health, environmental or machine guarding program is failing and that there are known reasons for this happening.

Introduction

- Where Do We Start?
- With a complete audit of your equipment program and reviewing these following elements:
 - Reviewing the machine guarding and safety program.
 - **Conducting An Audit Of The Entire Program.**
 - Ensuring that You Have Management & Employee Buy-in For The Program?

Introduction

- Purchasing Department – Bid Specifications & Safety Review of these documents.
- Have these professionals been trained on what to look for in a bid specification? For example if you order a drill press are they looking at the ANSI B11.8 and NFPA 79 electrical requirements?
- You must conduct an audit of these documents and procedures before purchasing the equipment.

Introduction

- Does the Safety, Health & Environmental Department Review & Signoff on the purchasing document before the documents go out the door?
- Is the machine inspected by a trained Safety, Health & Environmental professionals at the vendors location, when it comes into the facility and then gives final buy off before it is turned over to area management to use?

Introduction

- Machine Owners / Operator Manuals must cover specific information on that particular machine.
- Has everyone been trained in these documents and are they signed by the employees who attended the training?



Introduction

- Do you even have all of the owners / operators manuals for every piece of equipment that is located on your property?
- This includes an updated list by make, model and serial number?
- Do you look at the Consumer Product Safety Commissions website on a monthly basis to see if there are any recalls on the product?

Legal Four Lines Of Defense

- 1. You must have a program !**
- 2. The program must be in writing!**
- 3. The program must be effectively communicated for each machine that is built by using the owners / operators manuals.**
- 4. The program must be enforced and not by just writing up the employee but should be used for writing up the management for not ensuring the machine was safe to operate in the first place.**

Management Commitment.

The critical elements of any program but especially in developing an effective machine safety program are:

- **A safety management program cannot be successful without the active support of senior management.**
- Top level management support includes allocating resources to safety programs and demonstrating the organization's commitment to safety.

Designing An Effective Machine Safety Program

- Top management should be involved in implementing and communicating the program so that all employees understand that management's commitment is serious.
- Requiring accountability from all employees for safety and health matters.
- Integrating safety and health into business practices (e.g., purchases, contracts, design and development).

Designing An Effective Machine Safety Program

- Involving employees in safety and health-related activities (e.g., self-inspections, accident investigations and the development of safe work practices).
- Ensuring that written program goals, objectives, policies, procedures, implementation plans and review processes are communicated to employees.
- **The CEO should sign those written statements to demonstrate management's commitment to the program.**

Communication Of The Program

- The overall effectiveness of workplace machine safety measures depends on an organization's ability to effectively communicate safety and security goals and objectives.
- A communication strategy should be devised and implemented in a manner that supports the goals and objectives of the safety management program.

Communication Of The Program

- The steps in developing an effective safe machine guarding program and communication strategy are:
- First, identify the most important communications and documents involving workplace safety, and establish a baseline for later comparison.
- Example, you will need to review all engineering drawings, purchase orders, bid specifications, sign-off documents, owners / operators manuals, maintenance records, training records just to name a few.

Communication Of The Program

- *Employee involvement*
- Experience has shown that a further basic requirement of any good safety and health program regardless of size or type of workplace is to ensure employee participation in the design and operation of the program.
- The plan may involve a number of different structures for achieving employee participation: for instance, a safety committee, designation of key employees for various functions, ad hoc working groups or assignments within teams.

Communication Of The Program

- Clearly, rank-and-file workers are the persons most in contact with potential safety and health hazards and thus have a vested interest in effective protection programs.
- In addition, group decisions have the advantage of the group's wider range of experience.
- The maintenance personnel and machine operators are the people who have the knowledge in the machine operation.

Accountability

- Remember this “If your top level management official has not ensured that the employees have been properly trained in the equipments owners / operators manuals, then these management officials, maintenance personnel and machine operators were never properly trained.
- **Top Level Management must be held accountable to ensure that this procedure has been conducted**

Accountability

- Every owners / operators manual makes this statement

“Prior to allowing a person to operate this machine, FOR YOUR OWN SAFETY, READ INSTRUCTION MANUAL BEFORE OPERATING THE TOOL.

- **Learn the tool’s** application and limitations as well as the specific hazards peculiar to it”.

Enforcement Of The Program

- A worksite analysis is the identification of existing or potential hazards by conducting baseline worksite surveys for safety and health concerns.
- A worksite analysis often includes the following:
 - Conducting an audit of all machinery that is located in the facility using specific ANSI standards or other national & international standards as your guide for that particular machine.

Enforcement Of The Program

- Ensuring that an audit of engineering designs by the safety professional & final sign-off by top management before they are sent to purchasing.
- Ensuring that management, area supervisors, maintenance personnel and employees have been properly trained before they are allowed to operate the machinery. **This is usually never done!**

If training has not been performed, then the operation should not be allowed to begin.

Enforcement Of The Program

- **If management allows employees to operate the equipment without the proper safeguards or without safe work procedures being developed and being in place, then they are committing an illegal act and thus putting the company and more importantly, the employee at risk.**
- If the management puts the company and employees at risk, then management must be written up and be held accountable by top level management for their actions.

Introduction

- We all know that the safety of people, machines and processes is a key element of any sustainable business.
- But yet in the year of 2017 many Certified Safety, Health and Environmental Professionals working in industry today, do not know what to look for to ensure that they have an effective machine safeguarding program and also have safe properly guarded machinery and trained personnel.
- Why?

Introduction

- Although significant progress has been made in terms of safeguarding machines since the era prior to the organized safety movement (1970), companies continue to be cited by the Occupational Safety and Health Administration (OSHA) and workers continue to be injured, even killed by machine tools and equipment.
- Why is this still happening in the year 2017



Introduction

- It is common to see machine tools built in the forties, fifties and sixties being used in machine shops today. 80% of them are still not properly safeguarded.
- Why Is this still happening if we had an effective machine safeguarding program in place?
- In terms of machine safeguarding, these programs are either not written or they are not being enforced by management.

Introduction

- In addition to the potential threat of an OSHA citation, these conditions expose the operator to serious hazards that must be addressed.
- The safety professional can help line management determine workable solutions for these problems.

Introduction

- An extremely important area of Occupational Safety & Health Act of 1970 is the Federal OSHA standards, which protects a machine operator from hazards, associated with machinery and its operations.
- However, too frequently, the purpose of machine safeguarding is misunderstood in that it is thought to concern itself with the point of operation hazards only.



Introduction

- What do I do if I find a hazard while conducting a safety audit?
- Until the hazard can be corrected, You must notify the management and the employees.
- Build a safe work around procedure (JSHA) or Job Task Analysis (JTA) then educate everyone in the new procedure to protect the employees from being injured and enforce the safe work around procedure.

Introduction

Remember, you can not fix everything at one time, so conduct an effective risk assessment, place a category to it (High, Medium and Low Risk) and make sure that every hazard has been logged into the maintenance system to be repaired.

Upper level management then must track the hazards to ensure that the work is being done and ensure that safe work around procedures need to be written and implemented.

Your Role as a Company Manager or Safety Official.



Your Role as a Company Manager or Safety Official.

- If your company has a safety person, the role of the safety professional is to periodically monitor operations and advise line management with regard to what they need to do.
- **“Safety” is owned by line management and safety professionals are advisors to management and are not the enforcers, They are advisors to both management and the employees.**
- The responsibility to enforce the program belongs to line management – not the safety, health or environmental professional.

Your Role as a Company Manager or Safety Official.

Safety professionals who place themselves in the position of enforcing the safety process become thought of as the safety cop and will find it more difficult to maintain credibility and support among the workforce.

They can and will find themselves being held accountable by their manager for something they cannot control. Worse yet they can be held accountable in a court of law. So, It is important to your success to recognize the scope of your role.

The Problem With Your Machinery

- Today, many well known machine manufacturers still fabricate and sell their equipment without the necessary safeguards and electrical controls required by OSHA.
- They usually do not follow national consensus standards and various safety regulations to protect people from hazards not associated with the point of operation.
- Potential Greed from the machine manufactures usually wins over the priority of safety of people.

The Problem With Your Machinery Manufacturers

- A good example is a company called **Saw Stop** who makes a wood working machine with a safety device on it to prevent amputations.

They Even Brag About It!

- Then, this same manufacturer installs a by-pass switch so people can by-pass that safety feature and then use the machine to cut other materials.



The Problem With Your Machinery Manufacturers

- Remember, this machine was designed under ANSI O1.1 and was made to cut wood, not other materials like metal which is under a different ANSI standard.

IF YOU CUT METAL ON A SAW STOP MACHINE THEN YOU MAY BE VIOLATING ANSI B11.10 Safety Requirements for Metal Sawing Machines.



Examples Of Manufacturers Frequently Asked Questions (FAQ) Right From the SawStop Webpage

- Can I get a serious injury using a SawStop saw?
- In the vast majority of cases, coming in contact with the spinning blade will result in a minor cut.

However, if your hand moves into the blade at very high speed, it is possible for you to receive a serious injury.

- **Do you know how fast a hand can move? I think not!**

Examples Of Manufacturers Frequently Asked Questions (FAQ)

- Can I cut conductive materials?
- **Yes. You can operate the saw in Bypass Mode which deactivates the safety system's braking feature, allowing you to cut aluminum, very wet/green wood (see above) and other known conductive materials.**
- **Now this is called having knowledge that the manufacture built a potential unsafe machine or tells you to commit an unsafe act.**

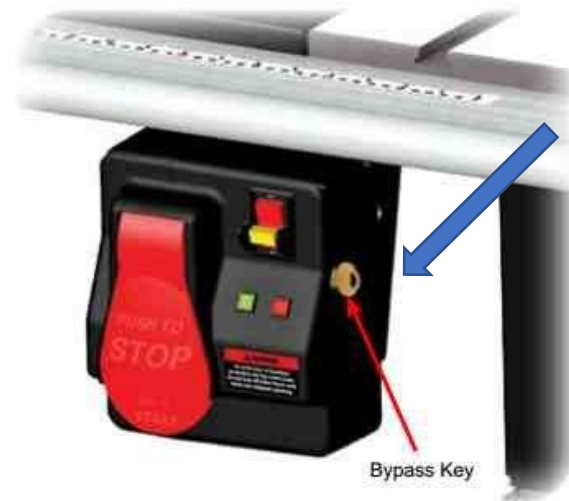
No Safety Warranty

- It is important to understand that the braking technology in SawStop table saws does not prevent contact with the blade – it minimizes the effect of the contact. It goes on to say in their owners manual **“If you use the saw in the By-Pass mode, the safety will be disabled and will not activate in the even you make contact with the blade”**
- So if you have this manufacturers saw, did you allow the management and operators know of this warning?

SawStop Owners Manuals

- You can download these safety owners/ operators manuals from this website or by following the link below.
- <http://www.sawstop.com/support/manuals/professional-cabinet-saw>

Safety Bypass key – This is called being negligent in a court of law if you allow your employees to run an unsafe machine or cut products for which the machine is not designed to cut. This is not a properly designed metal cutting saw unless it meets **ANSI B11.10—2003 (R2009**



Whirlwind Guarding Device

- May be a better solution for your machine guarding needs.
- Flesh-Sensing technology
- Stops blade within 1/8 second
- Plug & Play, removable
- No electrical modifications
- Varying degrees of protection
- Inexpensive relative to market options
- Non-destructive
- Restart immediately
- Fits existing saw/machine tools
- Integrated LED lighting
- Integrated sawdust removal

Take a look you may like it

<http://www.whirlwindtool.com/>

The Problem With Your Machinery

- Also, many of these same manufacturers never warn the person buying their equipment that these safety devices may be missing.
- Example, Power Outage Protection is usually missing from the machine.
- One well-known manufacturer of woodworking and metal working equipment representative stated that; “if their company put this required safety device (separate emergency stops and power outage protection) on their machine, they could not sell the equipment for under \$99.00.”

Remember Communication & Enforcement

- If you have one of these machines have you told your management and employees about these warnings?
- If not, You can be held personally liable.
- Would you like to go to jail?

Example: Bumble Bee Tuna Fatality Santa Fe Springs California.

The Problem With Your Machinery

- Would you want to purchase their equipment for employees to use without it being safe?
- Would you like to be cited by OSHA and penalized for not having the proper safeguarding equipment that was required to have been installed by the manufacturer?

The Problem With Your Machinery

- Machine safety standards have been in place for the last 100 years. But rarely do safety professional read them.
- A good example of this statement is that according to the most recent safety regulation, machinery must not be able to restart by itself after a power failure. Federal OSHA requires and they state in 29CFR 1910.213 (b)(3) the following;

“On applications where injury to the operator might result if motors were to restart after power failures, provision shall be made to prevent machines from automatically restarting upon restoration of power”.

JDS or Safe-Start Power Outage Protection Do You have one of these in your work area?



These are not UL approved devices and the last one although approved by UL can not be used to daisy chain a machine to it. Plus you may now have voided the machine manufacturers warranty.

Federal OSHA Standards On The Subject Of Machinery Restarting After A Power Failure

- OSHA's Response: There are no OSHA standards designed specifically to cover metal sawing machines or other types of machines.
- However, many of OSHA's standards for general industry are applicable to all types of machinery, including metal working equipment.

Federal OSHA Standards On The Subject Of Machinery Restarting After A Power Failure

- OSHA covers these types of hazards under 29 CFR 1910. 303 (b)(1) *Examination*. Electric equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees.
- OSHA 29 CFR 1910.303 (b)(2) *Installation and use*. Listed or labeled equipment shall be installed and used in accordance with any instructions included in the listing or labeling.
- Every ANSI standard has this requirement for power outage protection and you must follow ANSI/ NFPA 79 for electrical for machinery in your designs.

Federal OSHA Standards On The Subject Of Machinery Restarting After A Power Failure.

- Once again, remember 29 CFR Part 1910 Subpart S - Electrical 303(b)(1) provides that "electrical equipment **shall be free from recognized hazards** that are likely to cause death or serious physical harm to employees."
- The automatic restarting of a machine after a power failure would be a recognized hazard under many circumstances.

Do Manufacturers Produce Safe Machinery? NO!

- The following examples are hazards that manufacturers usually miss.
- Following the proper ANSI and other national and international consensus standards.
- Positioning of electrical controls so located that the operator does not have to leave their works station to shut the machine off.
- Installing emergency stops that should be Red in Color with Yellow background (ANSI / NFPA 79)

Do Manufacturers Produce Safe Machinery? NO!

- Most do not provide proper machine guards
- Most still leave belts and pulleys & other hazards exposed.
- Most do not provide proper non-slip walking surfaces and instead they use diamond deck.
- Most do not provide protection from flying chips and sparks.

Introduction

- For safe machinery, the supplier and user need to work together from the beginning.
- We all know that there are regulations for the protection of user personnel.
- We all know that the regulations may be subject to regional variations.
- However, there is a general process to be employed during the manufacture and upgrade of machinery.

Introduction

- **The only way to ensure that you have a safe machine is to follow the American National Standards Institute (ANSI) standards or other national and International Standards Organization (ISO) and the Electrical standards for that particular machine.**
- When should this all occur? During the design and manufacture of machinery, the supplier and user shall identify and evaluate all possible hazards and hazardous points by undertaking a risk assessment.

Introduction- The Big ANSI Standards For Risk Reduction

- According to the American National Standards Institute (ANSI) TR-3 Risk Assessment and Risk Reduction - A Guide to Estimate, Evaluate and Reduce Risks Associated with Machine Tools
- American National Standards Institute (ANSI) for each particular type of machine must be reviewed and used.
- ISO 14121 Safety of Machinery - Principles for Risk Assessment

Introduction- The Big ANSI Standards For Risk Reduction

- **ANSI B11.TR 1—2004**
- **Ergonomic Guidelines for the Design, Installation And Use of Machine Tools**
- The purpose of this guideline is to provide a uniform approach to ergonomic considerations for machine tools within the workplace.
- This document addresses those considerations which will assist in design, installation and use of manufacturing systems, including individual and integrated machine tools and auxiliary components.

Introduction- The Big ANSI Standards For Risk Reduction

- **ANSI B11.TR 2—1997**
- **Mist Control Considerations for the Design, Installation And Use of Machine Tools Using Metalworking Fluids**
- This document provides guidelines for a uniform approach to the control of airborne contaminants generated by stationary machine tools used to cut and form materials.
- Control shall be through the proper design, installation, use, and maintenance of the machine tool and its support systems (such as, but not limited to, metalworking fluid delivery systems and air cleaning equipment).

Introduction- The Big ANSI Standards For Risk Reduction

- **ANSI B11.TR 4—2004**
- **Selection of Programmable Electronic Systems (PES/PLC) for Machine Tools**
- The purpose of this Technical Report is to provide guidance for the design or selection, integration, and validation of PESs for the safety related functions of a machine production system.
- The terminology used in this document may not be used consistently throughout the industry, but this document does represent the concepts which are important when using and designing safety-related control systems.

Introduction- The Big ANSI Standards For Risk Reduction

- **ANSI B11.TR5—2006**
- **Sound Level Measurement Guidelines**
- The purpose of this Technical Report is to specify methods for measuring, evaluating and documenting sound levels emitted by a machine or machine production system(s) during normal operation and when running at idle, and to establish recommended sound levels at the various measurement locations around the machine or machine production system.

Introduction- The Big ANSI Standards For Risk Reduction

- **ANSI B11.TR6—2010**
- **Safety Control Systems for Machines**
- This Technical Report provides guidance in understanding and implementing safety-related control functions (functional safety) as they relate to electrical, electronic, mechanical, pneumatic, hydraulic components and systems for machine tools covered by the B11 series of safety standards.
- This document also identifies the relationship between ANSI B11.TR3 risk level (now included within ANSI B11.0) and that of the Categories and PLs of ISO 13489

Introduction- The Big ANSI Standards For Risk Reduction

- **ANSI B11.TR7—2007**
- **Designing for Safety and Lean Manufacturing: A guide on integrating safety and lean manufacturing principles in the use of machinery**
- This document provides guidance on the practical application of safety and lean manufacturing principles to machinery and manufacturing systems for improving performance, safety and quality by reducing injury and waste.
- The guidelines in this technical report assist machine tool users to minimize waste and risk associated with machinery and manufacturing systems, including individual and integrated machine tools and auxiliary components

Introduction- The Big ANSI Standards For Risk Reduction

- ISO 12100 Safety of Machinery - Basic concepts - General principles of design
- Note: These standards must be considered and used during the design and manufacture of machinery.
- The supplier and user shall identify and evaluate all possible hazards and hazardous points by undertaking a risk assessment.

Introduction- Other Important ANSI Standards

- ANSI B-11 Series For Metal Working Machinery
- ANSI B-155 For Palletizing Machines
- ANSI /PMMI B155.1-2000 Standard for Packaging Machinery and Packaging-Related Converting Machinery
- ANSO 0.1. for Woodworking Machines
- ANSI Z-535 Color Coding & Placarding
- ANSI / NFPA 79 Electrical Standards For Machinery and the list goes on and on.

A Properly designed Machine Guarding Program Will include The ANSI Standards.

- American National Standards Institute (ANSI) are standards developed by experts in the industry.
- These standards explain the hazards involved in operating machinery.
- ANSI's are considered "Best Practices"



Seven Steps To A Safe Machine



Seven Steps To A Safe Machine

1. For safe machinery, the supplier and user need to work together from the beginning.
2. Even though there are regulations for the protection of user personnel. Most manufacturers do not follow them, so your bid specifications play the most important part of having an effective program.
3. Regulations may be subject to regional variations.

Seven Steps To A Safe Machine

4. However, there is a general process to be employed during the manufacture and upgrade of machinery.
5. During the design and manufacture of machinery, the supplier and user shall identify and evaluate all possible hazards and hazardous points by undertaking a risk assessment.
6. Depending on this risk assessment, the supplier and user should agree how to eliminate or reduce the risk by suitable measures.

Seven Steps To A Safe Machine

7. If the risk cannot be eliminated by design measures, the supplier and user shall define and select suitable engineering controls.



Jack Podojil's Eighth Step

- **Add This Wording To Your Bid Specifications**, it puts the burden of safety back on the manufacturer to ensure they conduct a proper risk assessment according to the ANSI standards.

SAFETY DEFICIENCY CORRECTION WARRANTY

- **If the machine does not meet applicable safety standards (including, but not limited to OSHA, OSHA-approved state, ANSI (both general and specific to this type of machine, NEC, NFPA, ISO and other recognized consensus standards) the supplier shall correct all deficiencies at no cost to the owner.**

Also add this next verbiage to your bid specification.

Jack Podojil's Eighth Step

- **The supplier's financial responsibility, to rectify situations that can be shown were out of compliance to codes and standards (i.e., NEC, NFPA, ISO, OSHA, OSHA-approved state, etc.) when the equipment was new, does not relieve the supplier of responsibility regardless of the warranty expiration date.**
- **Thus the manufacture can not say that they did not know what their machine was going to be used for.**

Where Do I Go From Here And What Do I Need To Do?



Question To You?

Do I Have Enough Time To Continue?



The Machine Guarding Program



The Machine Guarding Program

- Have you and all of your employees been properly trained and I mean properly trained?
- Have all of your purchasing department, your design engineers, managers, maintenance personnel and your machine operators been properly trained in the ANSI, NFPA, NEC, OSHA etc. and the specific machine owners / operators manuals for that piece of equipment?
- **If not, your company will never achieve developing an effective machine guarding program.**

The Machine Guarding Program

- The safety professional is responsible to assess operations and identify potential hazards and controls associated with machine use.
- He or she will be expected to write the machine safeguarding program and help the organizations management with it's effective implementation, including employee training.
- Once these responsibilities are fulfilled, the safety professional should focus their attention on helping line management manage the program.

The Machine Guarding Program

- The first task to complete is conducting an assessment of the knowledge possessed by line management relative to safeguarding machines.
- Next, develop a succinct training course for line management that will bring their knowledge base to a satisfactory level.



The Machine Guarding Program

- Schedule one on ones (or meet with small groups) with line management to walk their areas of responsibility to identify operations that present safeguarding concerns.
- Make this your opportunity to educate line management with regard to the hazards and controls found in their assigned areas.
- Help them recognize what is expected of them (and workers) so they can appropriately enforce requirements.

The Machine Guarding Program

- It is important to prepare properly before attempting to convince management to support your safeguarding program.
- The safety professional should be thorough in their analysis of the problem and use both passive and active surveillance techniques to obtain the information necessary to package their proposal to management. Examples of these techniques follow.

The Machine Guarding Program

- Passive Review - OSHA injury logs to identify incidents related to machine safeguarding. [?]
- Review pertinent injury reports to determine the causal factors related to machine safeguarding related incidents tally the number of injuries, lost/restricted workdays and worker's compensation costs and assign a realistic monetary value or loss to the organization. [?]
- Review internal/external inspection records to determine the number and type of machine safeguarding deficiencies.

The Machine Guarding Program

- Active Review – Assess line management knowledge of safeguarding principles and requirements.
- Observe worker compliance to machine safeguarding requirements.
- Document machine safeguarding hazards using a digital camera and incorporate these photos into your presentation to management as appropriate.

The Machine Guarding Program

- Verify deficiencies cited in OSHA citations have been corrected and whether conditions continue to meet expectations.
- Develop a detailed path forward to address concerns related to safeguarding workers.
- Build or review formal Job Task Analysis (JTA) and educate everyone on them.

The Machine Guarding Program

- The next step involves scheduling time to make your presentation to management.
- Practice your presentation prior to delivering it and anticipate the questions you are likely to receive.
- Explain the anticipated benefits to the organization related to the safeguarding program.
- Give careful thought to which managers should be in attendance and choose a time for your proposal when those people can attend.

Effective Machine Guarding Program

- An effective machine safety program must begin with a thorough analysis of the potential hazards created by the machines used in your facility.
- You need to identify the specific hazards both mechanical, non-mechanical, and electrical.
- You must also have the owners / operators manual for each piece of equipment in your facility.

Effective Machine Guarding Program

- Basically, your goal in conducting a hazard analysis will be to identify existing or potential hazards at each phase of the operation of the machine.

Question, do you have JSA or JTA made from the machines owners / operators manuals? If not, you can not perform a complete JSA or JTA.

- On the basis of this analysis, you will then be able to determine the best way to reduce or eliminate those hazards.

The Written Program

- The machine safeguarding program should be written either as a stand alone document or as a section of the overall safety manual.
- In either case the program should be endorsed by senior management and signed by the President / CEO of the company.

The Written Program

- The written program establishes the foundation of the machine safeguarding program.
- Elements of the written program should include:
 - Purpose statement – customize to the organization/location.
 - Policy statement - address the use of safeguards in your organization.

The Written Program

- Roles/responsibilities – clearly articulate roles and responsibilities for workers, first line supervisors, management and the safety professional (this element of the overall program should appear in the written program and be emphasized in the training process).



The Written Program

- Scope of coverage – the program should state that the requirements apply to all company owned machine tools and equipment and all tools and equipment brought on site by contractors.
- Requirements – this section can be broken down to topical areas including general, woodworking tools, metal working tools, conveyors, belts, pulleys, shafts, etc.
- Types of safeguards – describe how and where various types of safeguards are used – prohibit makeshift safeguards

The Written Program

- Program assessments – describe who conducts these assessments and on what periodicity, i.e., initial assignment of safety responsibilities, when new machine tools/equipment are purchased and on a periodic basis
- Training – list required training and all operators and maintenance personnel must receive training in the equipment's Owners / Operators manuals for that particular machine or you have not properly trained them.

The Written Program

- Avoid taking the approach of writing the program, implementing it and then waiting to see what happens on the shop floor!
- Success is more likely if you involve a group of shop supervisors and workers in the process.



The Written Program

- This premise is also true when the action is to review an existing program.
- You may lead the group because of your knowledge of the standards, but your objective should be to achieve buy-in from this group prior to the new or modified program being implemented.
- The purpose of writing the document is to produce a program that will protect workers against injury and the organization against OSHA citations.

The Written Program

- Other Elements of the Machine Safeguarding Program In addition to the written program, the following elements are included in an effective safeguarding program:
 - Location-specific operator qualification program – develop and implement a site wide operator qualification program and enforce the rule that only trained, qualified operators are allowed to operate machine tools and equipment

The Written Program

- Work space layout – give your attention to how the shop floor is laid out and keep these principles in mind:
- Tool room is centrally located
- Straight line and ample space is provided around tools and equipment for handling large pieces

Assessing an Existing Safeguarding Program

- Whether you have just been given safety responsibilities or you have been managing safety in an organization for several years, it is a good, proactive practice to assess the safeguarding program.
- Accidents involving operating machinery often result in serious injury to the worker.

Assessing an Existing Safeguarding Program

- Situations in the plant change over time; new equipment and machine tools may be added to meet production levels.
- Remember, Bid Specifications play an important part of building an effective machine guarding program.
- The management and the safety professional can ensure the safeguarding program is up to date and adequately protecting workers by conducting a thorough assessment on a periodic basis.

Assessing an Existing Safeguarding Program

- Annual assessments are probably adequate; partial assessments can be completed at more frequent intervals if you know of changes in the operation.
- The safety professional should work with line management to establish the optimum frequency to assess operations.
- But all machinery must be inspected by management before each day begins.

Assessing an Existing Safeguarding Program

- The training provided to line management should include the instruction to monitor their areas for the installation of new machine tools and equipment – and additional controls that may be needed.
- All line management, maintenance personnel and machine operators should follow the written Job Safety & Health (JSHA), Activity Hazard Analysis (AHA), Job Task Analysis (JTA) or you will have accidents or near misses.

Assessing an Existing Safeguarding Program

- Formal assessments may be supplemented by periodic meetings with line management for the purpose of refreshing them with respect to safeguarding requirements.
- This opportunity can be used to solicit whether any new machine tools or equipment have been purchased or are being planned for purchase.

Assessing an Existing Safeguarding Program

- A quick review (annually) of the OSHA injury log will help the upper level management and the safety professional determine if the machine safeguarding program is effective.
- Injuries indicate a problem exists; either a safeguard was missing, was not operating as designed, or was removed by the operator during the operation of the equipment.

Assessing an Existing Safeguarding Program

- Line management either failed to detect the hazardous condition or failed to act on what they were told or saw in the workplace.
- Assessing the injury log and appropriate injury reports can help the safety professional identify weaknesses in the program and where their attention should be focused to help line management correct the problem.

Investigating The Incidents

- History has demonstrated the potential severity related to incidents involving machine tools and equipment.
- Operators of this type of equipment are exposed to these hazards virtually every time they energize the equipment.
- Incident investigation is an important duty of the safety professional

Investigating The Incidents

- In this regard, the safety professional can help line management understand the injury problem and also help them identify (and make meaningful changes to promote incident prevention) why incidents occur.
- In today's work environment, safety professionals recognize that simply citing human failure as the root cause of incidents may be short-sighted.

Investigating The Incidents

- Thorough investigations of incidents look beyond symptoms to identify the true root cause(s) of the incident.
- The root cause is often related to the management systems in place in an organization.
- As Dan Petersen noted “an accident is an indication of something wrong with the management system.”

Investigating The Incidents

- While it may be true that a worker suffered an injury while operating a machine tool after the guard had been removed, it is unlikely that the injury occurred the first time the guard was removed by an employee.
- It is also unlikely that the supervisor had never seen an individual operating the equipment in this manner.

Investigating The Incidents

- Something in the culture of that organization allowed (or maybe encouraged) the operation of that machine tool in the stated condition.
- Dan Petersen's point is simple: although the worker was at fault for having operated the tool in this condition (perhaps even removing the guard), it is the management system that allows the condition to exist.

Investigating The Incidents

- To fix the problem, the safety professional has to identify and address the weakness in the management system.
- In the example discussed above, a manager or safety professional might cite the unsafe act as operating the machine tool without the proper guarding in place and the unsafe condition as the missing guard.

Investigating The Incidents

- In doing so, the manager or safety professional has only identified symptoms related to the problem; his/her investigation has not determined why these conditions were allowed to exist.
- Weaknesses in the management system were not identified.
- Safety will improve when the investigation identifies the true root cause(s) and modifications are implemented to address them.

Summary

- Once again, the safety professional must understand their role in the safety process. “Safety” is owned by line management; the safety professional is responsible to assist line management with the implementation of the safety process.



Summary

- Safeguarding employees who work with or around machines or equipment is a concern for most safety professionals.
- The hazards associated with machine tools and equipment exist in nearly every industry.
- Whether new to the field or having managed safety for a period of time, the safety professional can benefit their organization through a careful evaluation of the safeguarding program.

Summary

The manager or safety professional tasked with developing a safeguarding program should consider the following key steps in the process:

- Systematically assess operations using both passive and active techniques to identify the hazards and controls associated with machine use
- Develop a convincing presentation to propose the safeguarding program to management
- Prepare the written program using input from line management and workers

Summary

- Remember: Identify machine-guarding deficiencies for each machine by performing a thorough documented machine safety assessment by using the machines owners / operators manuals and you must conduct a proper documented risk assessment.
- Keep in mind that both OSHA and the American National Standards Institute (ANSI) have standards that frame the “why” and the “how” of the risk assessments.

Summary

- Remember, it is important that machine inspections are performed by a qualified professional who understands not only the OSHA and ANSI standards but also the other applicable National Fire Protection Association (NFPA) and International Organization for Standardization (ISO) codes that apply and must know the materials located in the owners / operators manuals.
- A fresh set of eyes can often shed light on deficiencies that were previously overlooked
“Because it’s always been like that.”

Summary

- Prioritize the machines that need guarding upgrades.
- Many times, inspecting hundreds or thousands of machines uncovers a number of deficiencies that are just too great to tackle all at once, and a guarding program must be approached in phases to accommodate budgets.
- Sorting by risk assessment scores ensures upgrades are made in a logical order of “worst first.”

Summary

- The importance of machine operator buy-in cannot be underestimated.
- A typical machine operator spends more time operating “their” machine than they spend interacting with their family.
- They know that machine inside and out, with all its quirks.
- That’s why it’s extremely common to get pushback when there’s any mention of adding guarding to a machine.

Summary

- For the operator, not knowing what to expect creates a fear of the unknown – which leads to making statements like,
- “This guarding thing is crazy,”
- “How will this affect how I work on my machine?” and,
- “It’s been like this for 20 years – why change it now?”

Summary

- Document any and all machine-guarding improvements that have been made to a machine.
- While OSHA states it is the employer's responsibility to provide a workplace free of recognized hazards (the General Duty Clause), it is also the employee's responsibility to follow the employer's safety directives, and not remove or bypass machine guarding provided by the employer.

Summary

- In the event of an accident, if the employer has documented proof the machine has had the required regular, documented safety inspections and risk assessments, and provided correct and effective guarding that was disregarded or removed by operator – liability may shift.
- According to OSHA and ANSI standards, All belts, pulleys, gears, sprockets, shafting etc. must be inspected at a frequency to not exceed 60 days and you must show this documentation when needed.

Summary

- **Don't wait**
- Given potential liability issues, “I didn't know” is an inadequate answer.
- The good news is that with the proper processes, documentation and equipment in place, the number of machine-related accidents can be greatly reduced, if not eliminated completely – saving lives, expense, and in some cases, even your business.

Summary

- Please remember this: “Safe” is the state of being protected from recognized hazards likely to cause serious physical harm.
- There is no such thing as being absolutely safe, that is, a complete absence of risk, and therefore there is no machinery that is absolutely safe in the sense of being completely devoid of all conceivable risks.
- All machinery contains hazards, and some level of residual risk.

Summary

- However, the risk associated with those hazards should be reduced to an acceptable level.
- To achieve this goal, senior management should allocate appropriate personnel, time and resources to permit the risk assessment process to be successfully completed.
- Senior management holds the ultimate responsibility to determine the level(s) of acceptable risk

Questions?



If Not!

- **Thank you for attending this session.**

