

Lake County Safety Council

Monthly Luncheon

February 11, 2021

Today's Partner



The logo for HZW Environmental Consultants, LLC features a stylized green leaf inside a circular frame. Below the leaf, the text "HZW ENVIRONMENTAL" is written in a bold, sans-serif font, with "CONSULTANTS, LLC" in a smaller font underneath.

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General BWC News

- BWC is in the process shipping another 23 million face coverings to Ohio employers
 - You do not have to order them and you will not be billed for them
- BWC is administering a \$28 Million Air Quality Program for Senior Facilities
 - Reimburses up to \$15,000 to Ohio nursing homes, assisted living centers & adult day centers for air quality improvements made between 3/1/20 and 3/31/21.
 - Application deadline has been extended to 3/31/21

 Ohio Bureau of Workers' Compensation

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OSC ONLINE
2021 OHIO SAFETY CONGRESS & EXPO

Join us online
March 10-11

Registration opens in December. It's **FREE!**

We've Got You Covered

March 10-11, 2021
Registration is **FREE!**

www.ohiosafetycongress.com

Ohio Bureau of Workers' Compensation

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Private Employer – Important Dates

- March 1**
 - Self-Insured SI – 40 due
- March 3**
 - Self-insured assessment – first half
- March 31**
 - DFSP annual report
 - One Claim Program education requirement
 - EM cap requirements due
 - Request to change estimated payroll exposure

Ohio Bureau of Workers' Compensation

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Public Employer – Important Dates

Feb. 15

- Payroll true up report

Feb. 16

- Lump Sum Settlement submission

March 2

- Drug Free Safety Program action plan

March 31

- PEC experience snapshot



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BWC Monthly Employer Webinars

The February webinar will include:

- BWC updates on COVID-19
- True up and why it's important to review your Estimated Annual Premium (EAP)
- Winter hazards
- Monthly safety tip: Developing a Driver Safety Program

- Webinar Dates: 1:30 p.m. Tuesday, Feb. 9
 11:30 a.m. Thursday, Feb. 25



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Policy Year 20-21 Update

Safety Training Requirement for Bonus Programs

- 2019 training requirements were waived due to impact of COVID
- 2020 training requirements **will not** be waived



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BWC Safety Webinars

- | | | |
|-----------------------------------------|---------|-------------------------|
| ○ Accident Analysis | Feb. 9 | 11:00 a.m. – 12:00 p.m. |
| ○ Office Ergonomic Tips for Teleworkers | Feb. 17 | 1:30 p.m. – 2:30 p.m. |



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BWC DSH Virtual Training

- | | | |
|----------------------------------------------------|---------|-----------------------|
| ○ OSHA Recordkeeping Half-day Workshop | Feb. 10 | 9:30 a.m. - 1:00 p.m. |
| ○ Job Safety Analysis | Feb. 18 | 1:00 p.m. - 4:30 p.m. |
| ○ Lockout/Tagout and Safety-related Work Practices | Feb. 23 | 1:00 p.m. - 4:30 p.m. |
| ○ Hazard Communication | Feb. 25 | 9:30 a.m. - 1:00 p.m. |
| ○ Developing a Driver Safety Program | March 1 | 9:30 a.m. - 1:00 p.m. |
| ○ Emergency Preparedness Planning | March 4 | 9:30 a.m. - 1:00 p.m. |



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BWC Consultative services

- Onsite visits are currently suspended due to COVID-19, but we are providing consultative services via phone call, email and other electronic means
 - Review of safety programs/policies
 - Assistance with training content or programs
 - Assessment of specific operations or tasks



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Thank you for all of you do to protect the safety and health of your employees!

Mike Rienerth, Loss Prevention Supervisor
Ohio BWC – Division of Safety & Hygiene
216-538-9724
Mike.R.1@bwc.state.oh.us



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Introducing Ken Hackworth, PE



Ken Hackworth, PE

Ken Hackworth, PE is a Senior Safety Engineer in the area of Control Systems and Safety Engineering.

Background

Ken Hackworth, PE has more than 25 years of experience in industrial controls and functional safety systems and is a licensed Professional Engineer (PE) and a certified Functional Safety Engineer. Ken received his Bachelor of Science in Electrical Engineering from The Ohio State University, is a subcommittee member of ANSI B11 safety standards and a member of the American Society of Safety Professionals.

Ken is experienced and certified in U.S. and international safety standards, including OSHA, ANSI, NFPA, RIA, and ISO/EN standards and specializes in machine safety engineering and compliance consulting. As a trainer for OSHA, Ohio BWC and several multi-national industrial clients, Ken enjoys training safety professionals, technical staff and business leaders in the latest technology and safety standards for industrial machinery.



Ken Hackworth, PE
Senior Safety Engineer

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Agenda

- 01** Step 1: Motivation to Prevent Machine Injuries
- 02** Step 2: Discovery of Hazards
- 03** Step 3: Control of Hazards
- 04** Summary and Q&A



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Machine Safety Specialists Profile



Since 1977, Machine Safety Specialists has helped businesses improve industrial workplace safety and become compliant with OSHA, ANSI, NFPA, and ISO/EN machine safety standards.

We are experts in:

- Machine safeguarding
- Risk assessment programs
- Safety control systems (control reliability and functional safety)
- OSHA, ANSI, NFPA, and ISO/EN machine safety standards
- Machine safety training and compliance consulting services

When it comes to safeguarding your company, facilities and team, Machine Safety Specialists has the expertise and experience to prevent and protect you from industrial accidents and/or safety infractions.

➤ *MSS has representation on ANSI sub-committees, including ANSI B11.19 and ANSI B11.26.*

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Company Profile



RISK ASSESSMENT



TRAINING



RISK ASSESSMENT SOFTWARE APPS



CONSULTING AND EXPERT WITNESS

Our clients include:

- | | | |
|------------------------|--------------------------|-------------------------|
| • Alcoa | • Edgewell Personal Care | • Olin Winchester |
| • Alcon / Novartis | • Eli Lilly and Co. | • OSHA |
| • Amgen | • Energizer | • Owens-Corning |
| • Anderson Windows | • Goodyear Products | • Procter & Gamble |
| • Avery Dennison | • Honda | • Saint-Gobain |
| • Bosch Tool | • Kellogg's | • Tesla |
| • Bridgestone | • Koch Industries | • Timken Steel |
| • Cargill Incorporated | • Lincoln Electric | • Treehouse Foods |
| • Cincinnati Inc. | • Magna | • Unilever |
| • Coca-Cola | • Mary Kay | • US Navy |
| • Colgate-Palmolive | • Newell Rubbermaid | • Whirlpool Corporation |

➤ *MSS has a close working relationship with OSHA and provides compliance officer training.*

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Three Steps to Prevent Machine Related Injuries

For fixed industrial machinery



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Scope of Presentation



Included:

- Fixed, industrial machinery
- Fixed, powered laboratory equipment
- Robotics and machine tools
- Automated and custom industrial machinery

Note: "Fixed" machines means "Stationary"



Excluded:

- Cranes, elevators, lifting equipment
- Mobile equipment (forklifts)
- Appliances
- Portable tools, hand tools
- Fire detection and suppression
- Electrical shock (grounding) and fire

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Three Steps to Preventing Machine Injuries

<p>Step 1:</p>  <p>Motivation to Prevent Machine Injuries</p>	<p>Step 2:</p>  <p>Discovery of Hazards</p>	<p>Step 3:</p>  <p>Control of Hazards</p>
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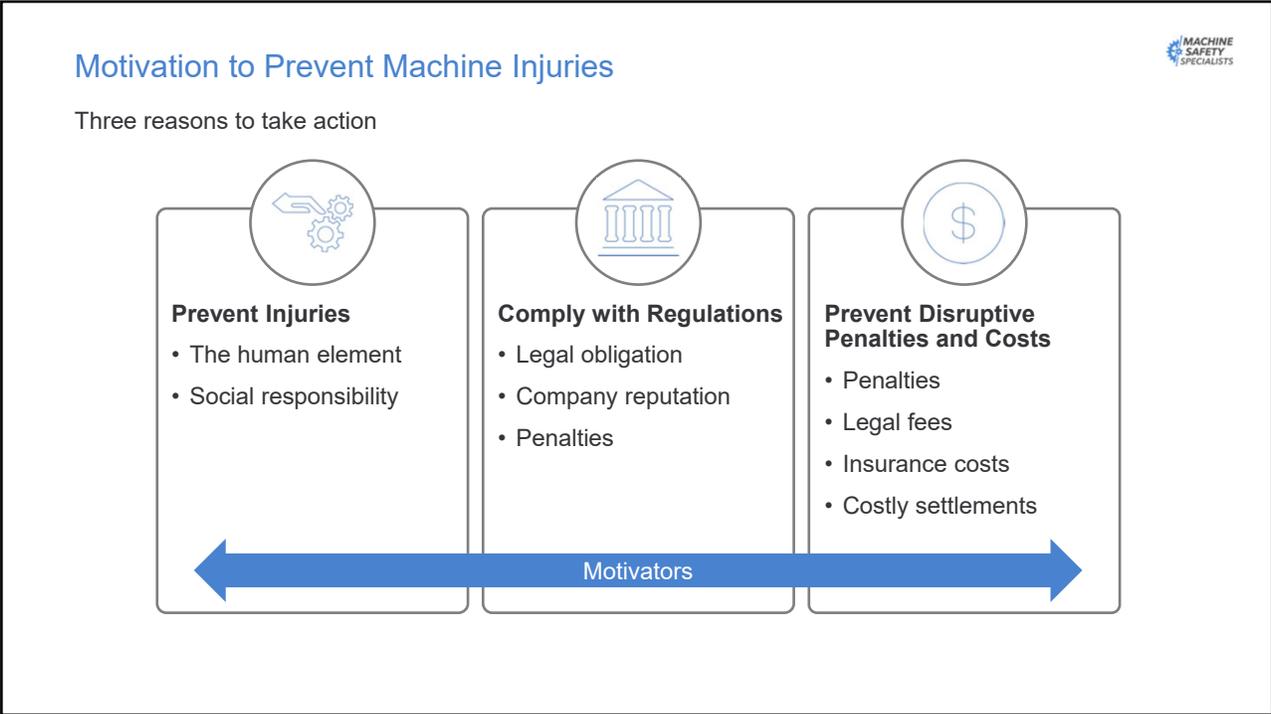
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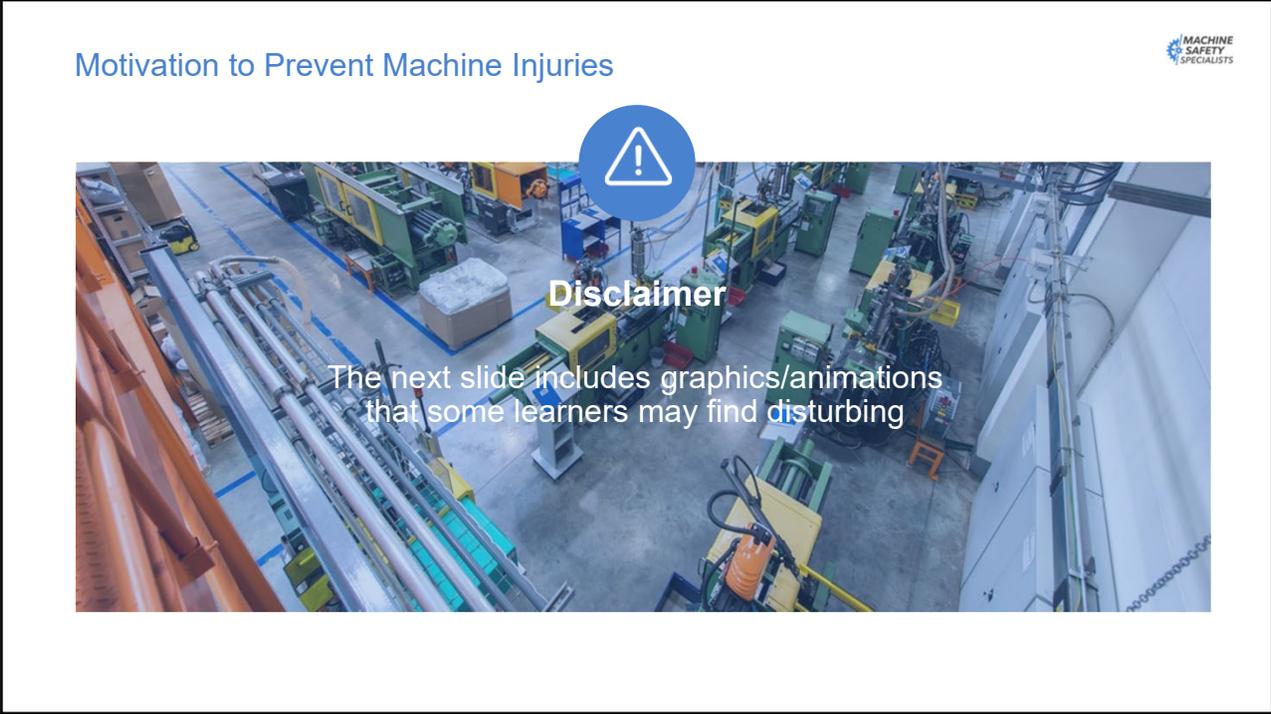
Step One:
Motivation to Prevent Machine Injuries



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Motivation to Prevent Machine Injuries
The Human Element



All of us have a **social responsibility** to prevent injuries

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Motivation to Prevent Machine Injuries
Comply with Regulations



- **OSHA 1910.212(a)(3)(ii)**
“...The [machines] shall be so designed and constructed as to prevent the operator from having any part of his body in the danger zone during the operating cycle...”
- **OSHA SEC. 5. Duties (“General Duty Clause”)**
“Each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.
- **OSHA may reference and require compliance with National Consensus Standards, such as: ANSI, NFPA, RIA, etc.**



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Motivation to Prevent Machine Injuries
Prevent Disruptive Penalties and Costs



Guards removed willfully?

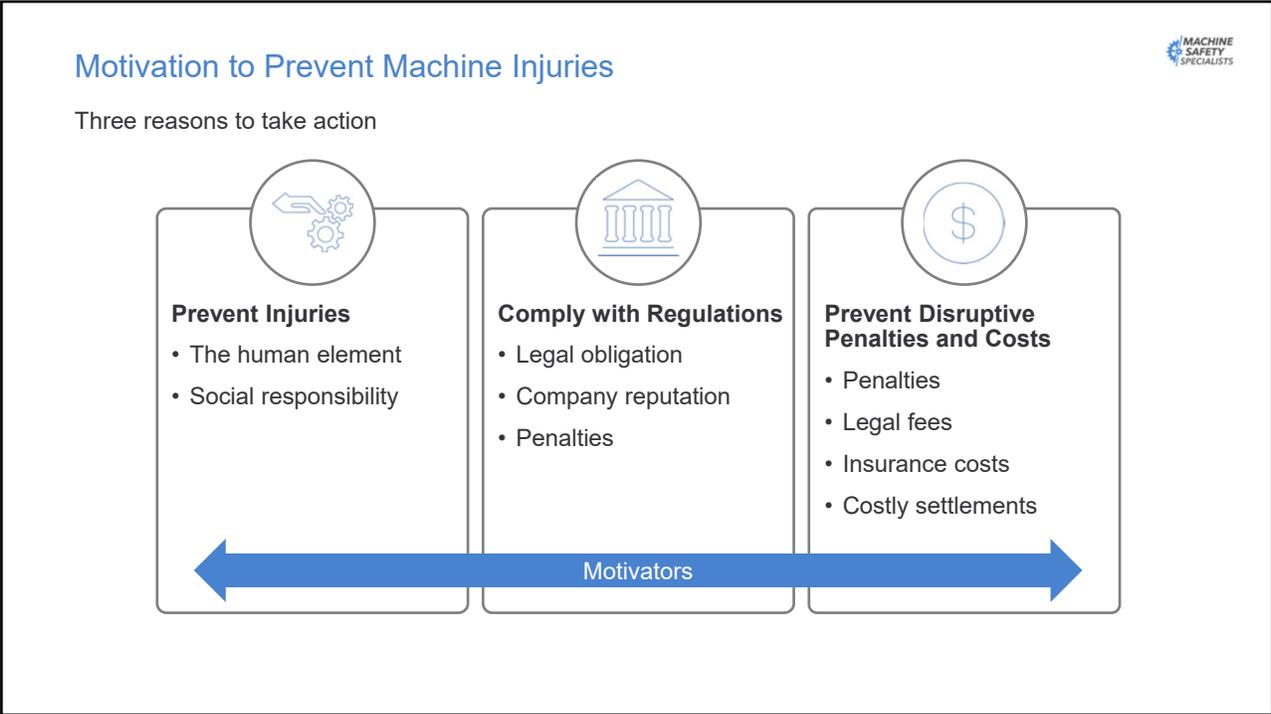
Guards removed willfully?

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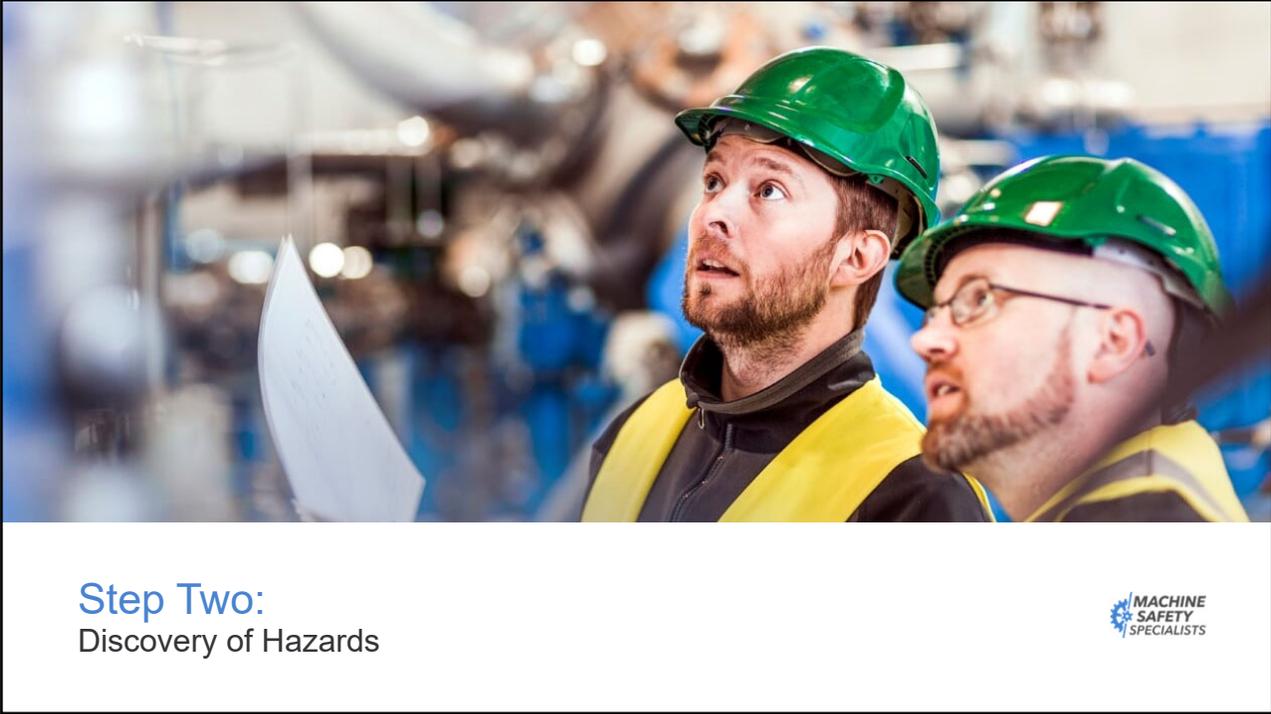
Motivation to Prevent Machine Injuries
Prevent Disruptive Penalties and Costs

Level	Old Maximum Penalty (Pre 2016)	2021 Maximum Penalty
Serious	\$7,000 per violation	\$13,653 per violation
Other than Serious	\$7,000 per violation	\$13,653 per violation
Willful or Repeat	\$70,000 per violation	\$136,532 per violation
Posting	\$7,000 per violation	\$13,653 per violation
Failure to Abate	\$7,000 per day unabated beyond the abatement date (generally limited to 30 days maximum)	\$13,653 per day beyond the abatement date (generally limited to 30 days maximum)
Criminal (willful violation causes employee death)	\$250,000 for individual 6-month prison term \$500,000 for Corporation	\$250,000 for individual 6-month prison term \$500,000 for Corporation

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Hazard Discovery Strategies



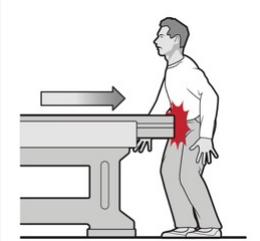
- 01** Professional Machine Safeguarding Audits
 - **Expert** guidance
 - Trained safety engineers
 - Specific recommendations
 - **Considerations:** Best answers, best solutions, cost
- 02** Machine Risk Assessment Process
 - **Team based**, task-based approach
 - Reference ANSI B11.0 (in U.S.), ISO 12100 (outside U.S.)
 - **Considerations:** Time intensive, team training, technical knowledge
- 03** Plant Walkthroughs
 - DIY Process
 - Convenient
 - **Considerations:** Complacency, technical knowledge, liability and responsibility

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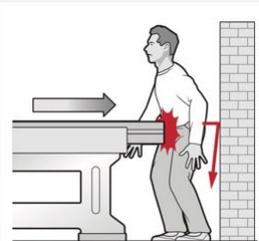
Hazard Discovery Examples

Common Hazards





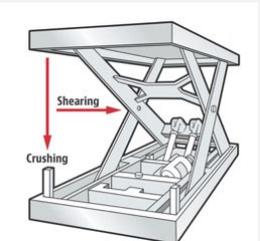
"Struck by" (Impact)



Crush



"Struck by" Robot (Impact)

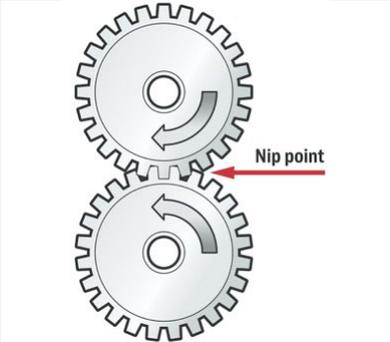


Shear and Crush

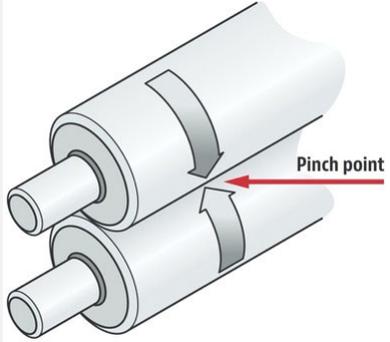
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Hazard Discovery Examples
In-running nip points





Typical exposed gears

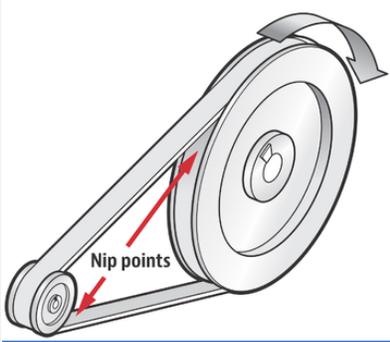


Typical feed rolls

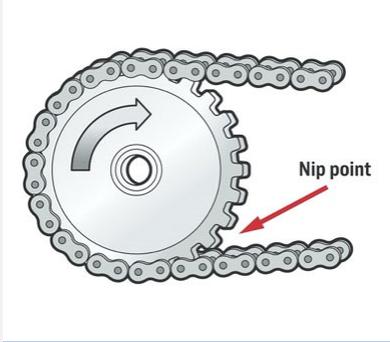
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Hazard Discovery Examples
In-running nip points





V-Belt and pulley drive:
A common source of in-running nip points on industrial machinery

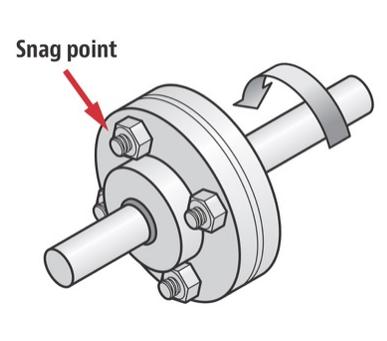


Typical chain-sprocket drive

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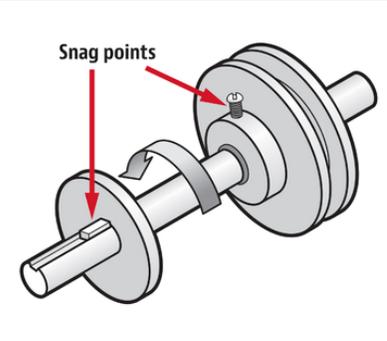
Hazard Discovery Examples
Rotating nip points





Snag point

Snagging hazard from projecting flange bolts on rotating coupling



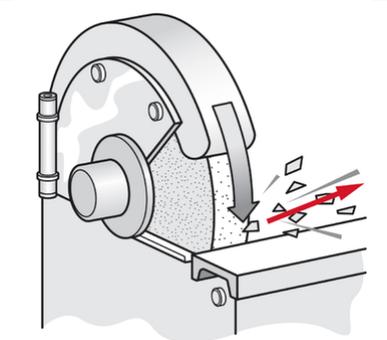
Snag points

Snagging hazard from projecting keyway and set screw on rotating shaft

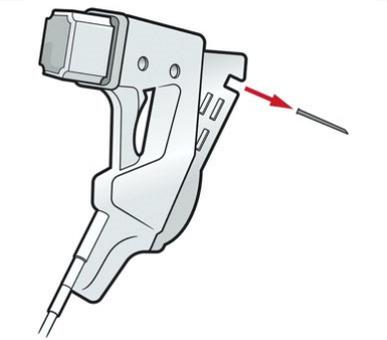
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Hazard Discovery Examples
Fragments and Projectiles





Fragments from abrasive wheel



Projectile from nail gun

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Hazard Discovery Examples
Industrial Saw



Electrical shock hazard

Exposed belt/pulley:
In-running nip hazards

Exposed blade:
Cutting hazard



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Hazard Discovery Examples
Industrial Robot Manufacturing System



Robot:
Impact, crushing,
stabbing/puncture -
See ANSI/RIA 15.06

Custom Machine:
Crushing, cutting -
See OSHA & B11



Note: Specialized expertise is required

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Hazard Discovery Strategies



Professional Machine Safeguarding Audits

- **Expert** guidance
- Trained safety engineers
- Specific recommendations
- **Considerations:** Best answers, best solutions, cost

Plant Walkthroughs

- DIY Process
- Convenient
- **Considerations:** Complacency, technical knowledge, liability and responsibility

01

02

Machine Risk Assessment Process

- **Team based**, task-based approach
- Reference ANSI B11.0 (in U.S.), ISO 12100 (outside U.S.)
- **Considerations:** Time intensive, team training, technical knowledge

03

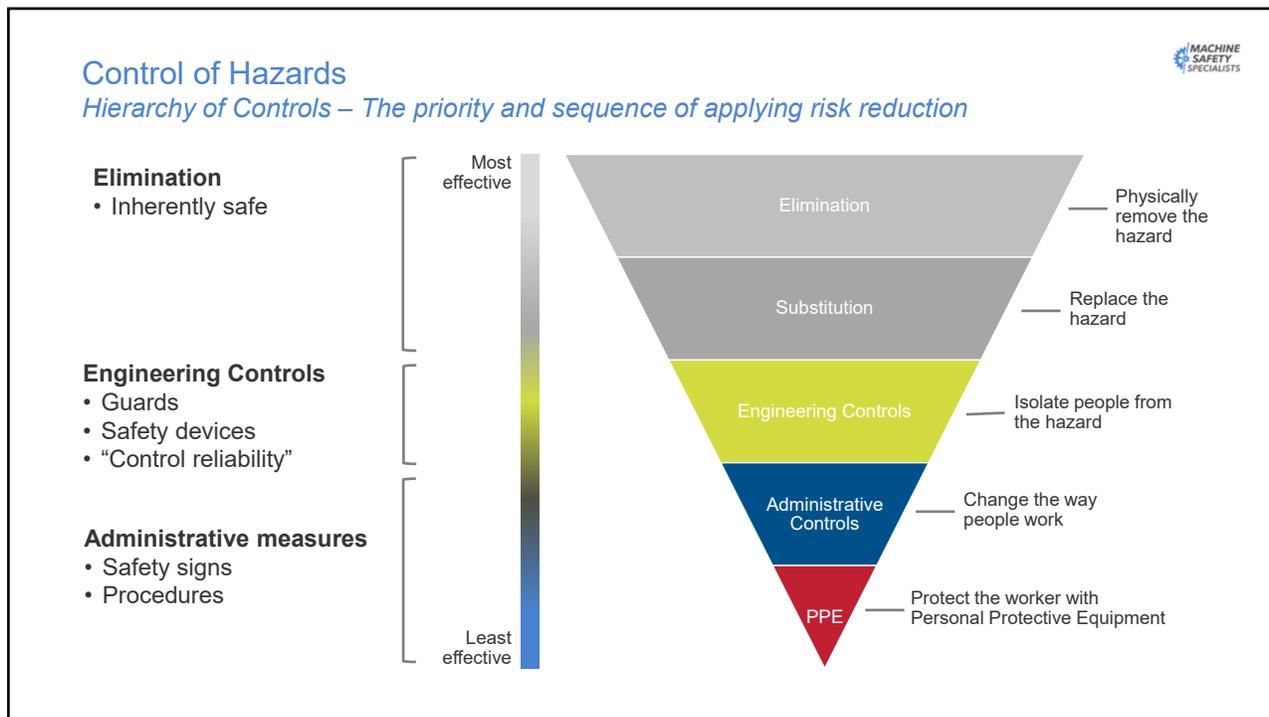
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Step Three:
Control of Hazards



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Control of Hazards – Mitigation Proportional to Risk Level

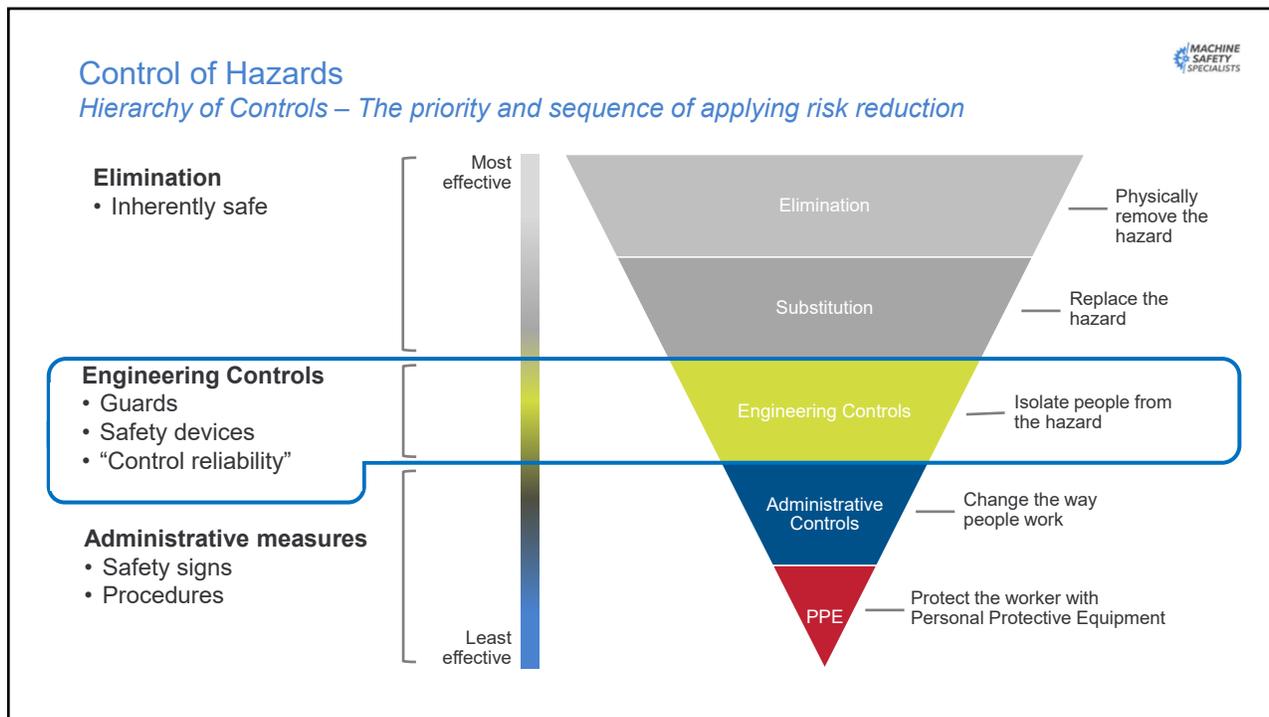
Hazard control proportional to risk

- Risk reduction should be appropriate and proportional to the risk level
Note: Risk reduction may not be less than required safety codes/standards
- Follow the hierarchy of controls (NIOSH)
- Functional safety systems (“control reliable systems”) are often required
- Formal verification and validation (checking and testing) are required

ANSI/RIA TR 15.306 – Table 4
Minimum risk reduction measures as a function of unguarded risk level

Risk Reduction Measure	Risk Level				
	VERY HIGH	HIGH	MEDIUM	LOW	NEGLIGIBLE
Elimination	One or a combination of Elimination, Substitution, and Safeguarding or SRP/CS is REQUIRED to reduce risks to an acceptable level			One or any combination of the Risk Reduction Measures that will acceptably reduce the Risk Level may be used	
Substitution					
Safeguarding/SRP/CS					
Warnings and Awareness Means	Complementary Protective Measures may be used in conjunction with the above risk reduction measures but shall not be used as the primary risk reduction factor				
Administrative Controls					
PPE					

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Engineering Controls – Mechanical Guarding

Mechanical guarding must be validated to applicable safety standards in your region

- See regulatory requirements in your region:
 - U.S.: OSHA, ANSI B11, UL
 - ISO: Machine directive, ISO 13857, etc.
- Measure guards to ensure they comply
- Must use “secure” fasteners
- Interlock circuits and “exclusive control” concepts are critical
- Third party expertise is recommended



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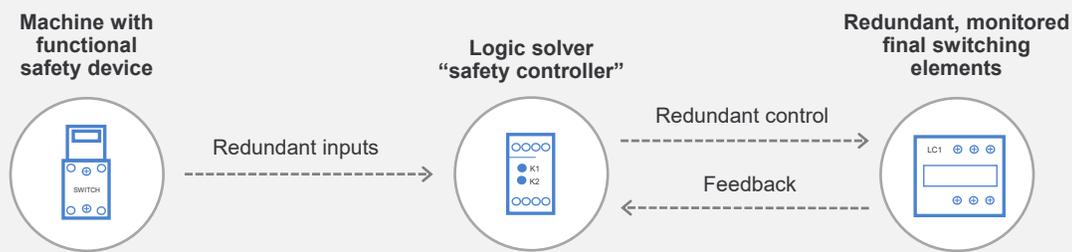
Engineering Controls – Functional Safety and Safety Devices



“Control reliable” circuits are critical for safety.

- Typical reliability requirements:
- No single points of failure
 - All dangerous failures are monitored

Functional safety systems are typically required



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Engineering Controls – Risk Assessment and Functional Safety



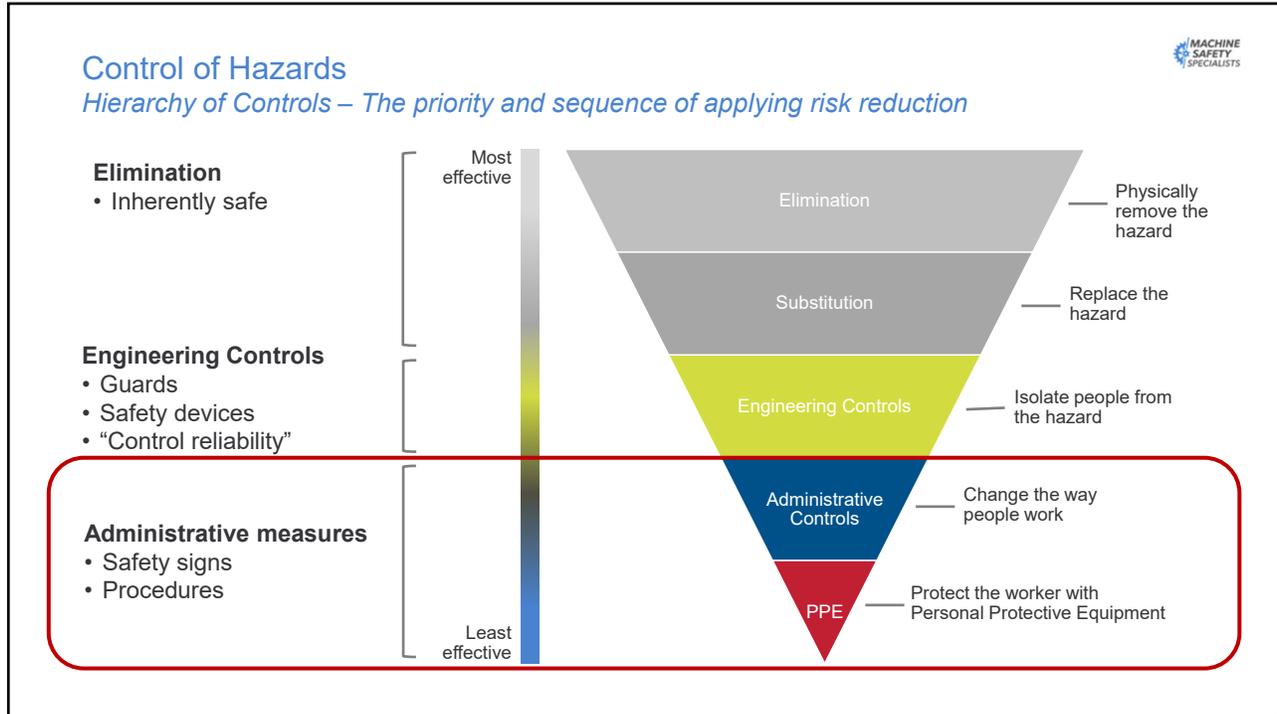
Risk assessment determines the required functional safety performance.

ANSI/RIA TR 15.306 Risk Levels + ISO 13849 Circuits

Severity of Injury	Exposure to the Hazard	Avoidance of the Hazard	Risk Level	Min SRP/CS Requirements	
				PLr	Structure Category
S1 - Minor	E0 - Prevented	A1 - Likely	NEGLIGIBLE	B	-
	E1 - Low				
	E2 - High	A2/A3 - Not likely/possible			
S2 - Moderate	E0 - Prevented	A1 - Likely	LOW	C	2
	E1 - Low				
	E2 - High	A2/A3 - Not likely/possible			
S3 - Serious	E0 - Prevented	A1 - Likely	MEDIUM	D	2
	E1 - Low				
	E2 - High	A2/A3 - Not likely/possible			
S3 - Serious	E0 - Prevented	A1/A2 - Likely/Not likely	HIGH	D	3
	E1 - Low				
	E2 - High	A3 - Not possible	VERY HIGH		



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Administrative Controls

Administrative controls = Least effective methods

- Depend on human factors
- Inadequate for medium to high-risk machines
- Typically, inadequate for modern machine safety standards
- Examples include:
 - Work procedures
 - Worker training and supervision
 - Safety signs, etc.
- Less effective than Engineering Controls

DANGER
GENIUS AT WORK

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Summary



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Three Steps to Preventing Machine Injuries



Step 1:

Motivation to Prevent Machine Injuries

- Social responsibility
- Comply with regulations
- Prevent disruptive penalties



Step 2:

Discovery of Hazards

- Professional safeguarding audits
- Risk assessments
- Plant walkthroughs



Step 3:

Control of Hazards

- Apply the hierarchy of controls
- Mechanical guarding
- “Control reliability” and functional safety systems are critical
- Administrative controls = Least effective

- At a minimum, safeguarding must comply with all applicable regulations and safety standards in your region.
- Independent third-party expertise is recommended

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Any Questions?



Contact Us

 info@mss-safety.com

 <https://www.machinesafetyspecialists.com/>

 <https://www.machinesafetyspecialists.com/risk-assessment-tools/>



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This presentation and any attachments include our opinions as related to this matter. We hold these opinions to a reasonable degree of engineering and scientific certainty based on relevant literature and standards, common practice in the industry, and materials reviewed till date. If new data becomes available, we reserve the right to supplement or amend this presentation and/or attachments.

The contents of this presentation and any attachments are intended to convey general information only and not to provide legal advice. The contents of this presentation and any attachments should not be construed as, and should not be relied upon, for legal advice in any particular circumstance or fact situation.





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