



Safe Hands, Safe Machines: Recycling Industry Safety Tips

Shawn Smith, Senior Product Director

Stephany Birkholz, Regulatory Project Manager

About The Speakers



Shawn Smith, Senior Product Director, Training

Shawn Smith has 30+ years of training production, programming, and learning management expertise. He leads KPA's dynamic training and content team, a group of self-proclaimed nerds and individuals who are passionate about keeping your employees safe. He oversees the trifecta of compliant, impactful, and innovative Environmental, Health, and Safety (EHS) resources at KPA. In his spare time, he is a high school robotics coach in Hershey, PA, pursuing global acclaim and inspiring today's youth to be themselves.



Stephany Birkholz, Regulatory Project Manager

Stephany Birkholz re-joined KPA in 2024 as the Regulatory Project Manager. She previously served eight years with KPA as an EHS Consultant and Team Supervisor in manufacturing and automotive industries. Prior to KPA, Stephany worked for the Florida Dept of Env. Protection as a hazardous waste inspector and provided compliance assistance to household hazardous waste collection sites, and scrap/waste recyclers, among other industries.

She earned her B.S. from the USF in Environmental Science and Policy with a minor in Geology, is a Certified Hazardous Materials Manager (CHMM), Registered Environmental Professional (REP).

Agenda

- Hand Safety Essentials
- Machine Guarding Unveiled
- Mastering the Line of Fire
- Safety Culture Keys
- Q&A

Hand Safety Essentials

Crushing Hand Injury Story

Employee needed to move some material from one area to another. The employee was using a crane to lift 5 steel pipes. As the load began to lift the employee reached out with one hand to guide the load and placed his fingers on top of one of the pipes as the load began to settle. In an instant the pipes fell directly onto the employee's fingers. He quickly pulled his hand away from the load and looked at his hand and saw that his fingertips were gone.



Common Hand Injuries

- **Tendinitis:** Inflammation of tendons, often caused by repetitive motions.
- **Carpal Tunnel Syndrome:** A condition affecting the median nerve in the wrist, often leading to pain, numbness, and tingling.
- **Cuts:** Slices, lacerations, and punctures caused by sharp objects.
- **Crushes:** Injuries resulting from being caught between objects or machinery.
- **Burns:** Thermal burns from hot materials or chemicals.
- **Contusions:** Bruises or soft tissue injuries.
- **Amputations:** Severe injuries that may result in the loss of fingers or parts of the hand.



Causes of Hand Injuries

- **Sharp Objects:** Knives, blades, broken glass, and other sharp materials.
- **Heavy Machinery:** Presses, balers, shredders, and other equipment.
- **Improper Handling:** Lifting heavy objects incorrectly or using hands for tasks they are not designed for.
- **Hazardous Materials:** Chemicals, solvents, and other substances that can cause burns or skin irritation.
- **Lack of PPE:** Not wearing appropriate protective gloves or other personal protective equipment.
- **Repetitive Motions:** Performing the same actions over and over, which can lead to overuse injuries.
- **Distractions:** Working while distracted or fatigued, which can increase the risk of accidents.



Personal Protective Equipment



- **Select the right gloves for the job and appropriate for the specific task and hazard being addressed:**
 - **Cut-Resistant Gloves:** Designed to protect against sharp objects and reduce the risk of cuts and lacerations.
 - **Chemical-Resistant Gloves:** Provide protection against corrosive substances and chemicals.
 - **Heat-Resistant Gloves:** Protect hands from burns when handling hot materials.
- **Additional PPE for the hands, wrist and arms when needed:**
 - **Impact-Resistant Gloves:** Offer protection against blunt force trauma.
 - **Arm Guards:** Provide additional protection for the forearms and wrists.
- **Regular Inspection and Maintenance:** Ensure that PPE is in good condition and is regularly inspected and maintained.

Safe Material Handling Techniques

- **Use Mechanical Aids:** Utilize carts, dollies, or other equipment to assist with lifting and moving heavy materials.
- **Keep Loads Balanced:** Ensure that loads are evenly distributed to prevent strain on your back and arms.
- **Avoid Pinch Points:** Be aware of pinch points between objects or machinery to prevent crushing injuries.
- **Use Proper Gripping Techniques:** Use a firm grip on objects to maintain control.
- **Wear Appropriate PPE:** Ensure that you are wearing the correct gloves and other protective equipment for the task at hand.
- **Take Breaks:** Rest frequently to avoid fatigue and reduce the risk of accidents.



Story

A lesson in Ergonomics

- A worker sorts through piles of scrap metal and debris by hand on a conveyor.
- The worker is required to bend, reach, and lift various materials continuously throughout their shift.
- What are some of the contributing factors that could lead to an injury in this scenario?
- What are some of the injury prevention strategies?



Story

A lesson in Ergonomics

Contributing Factors:

- **Repetitive Motions:** Frequent gripping, lifting, and twisting can strain muscles and tendons.
- **Poor Ergonomics:** The work area may not be designed to promote good posture, requiring the worker to stretch or twist excessively.
- **Lack of Breaks:** Insufficient breaks or job rotation can increase fatigue and the risk of injury.

Prevention Strategies:

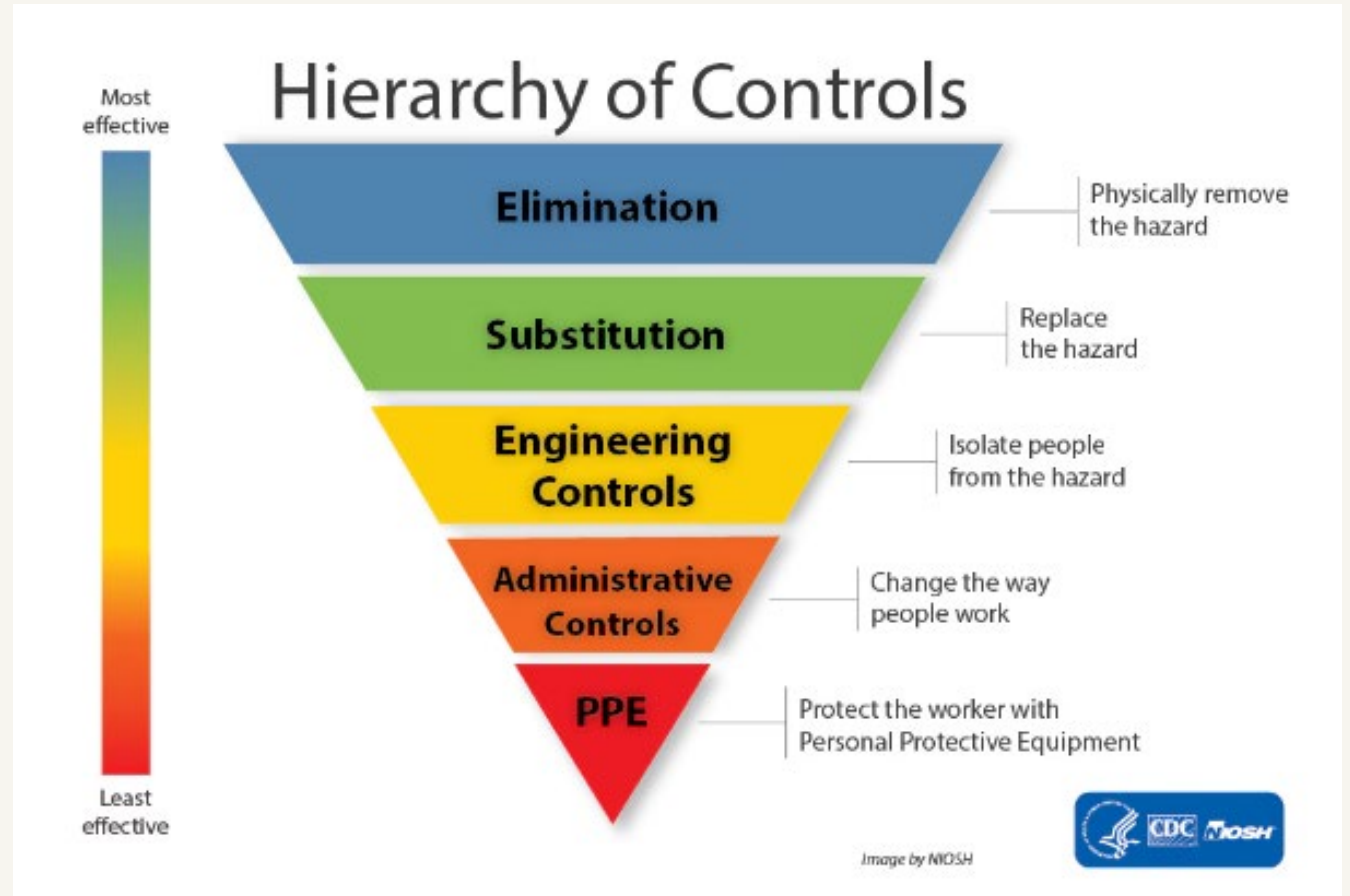
- To prevent such ergonomic injuries, recycling facilities can implement strategies like:
- **Ergonomic Training:** Educating workers on proper lifting techniques and body mechanics.
- **Workstation Design:** Adjusting workstations to be at a comfortable height and reducing the need for excessive bending or twisting.
- **Job Rotation:** Rotating tasks among workers to minimize repetitive strain on any one body part.
- **Regular Breaks:** Encouraging workers to take short breaks to stretch and rest their muscles.

Machine Guarding Unveiled

The Hierarchy of Controls

Utilize the Hierarchy of Controls to control exposure to hazards in the workplace

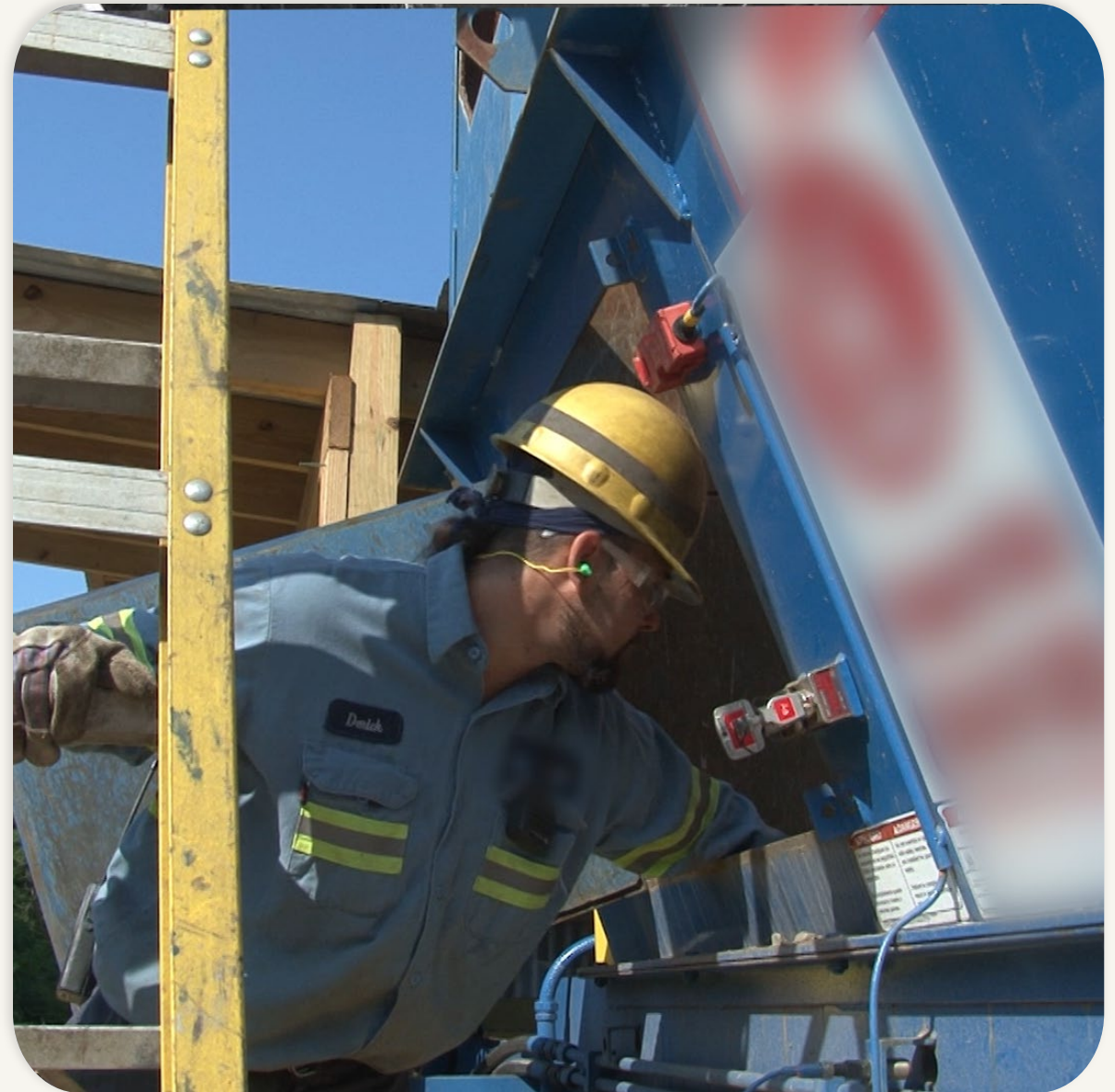
- **Elimination** - Designing tools or machinery that don't require hand contact with moving parts
- **Substitution** - Using ergonomic tools or equipment that are designed to reduce the risk of hand
- **Engineering** - Installing guards or barriers around machinery to prevent accidental hand contact with moving parts or creating safety interlocks that stop machines if guards are removed.
- **Administrative Controls** - Implementing safety protocols and training programs that emphasize proper techniques for using tools and machinery, including regular reminders and checks to ensure compliance.



Story

Consider a scenario involving a worker preparing to clean and perform maintenance on a baler. He removed the guard and began to inspect the equipment. A nearby worker unaware that the employer had removed the guard and was performing maintenance started up the machine. The employee quickly removed his hand from the moving parts of the baler before his hand was cut and crushed.

What type of controls should have been put in place to prevent this potential serious injury from occurring?



Hierarchy of Controls

How could this injury have been prevented?

- **Elimination:** Design the process that where inspecting/maintenance is done remotely, eliminating the need for any employee place their arm inside the baler.
- **Substitution:** Use a different inspection method, such as a telescoping camera, that doesn't pose the same risk of hand injury.
- **Engineering Controls:** Install an interlock switch that prevents baler from operating when the guard is removed. Lockout all energy sources before performing any maintenance.
- **Administrative Controls:** Implement training sessions on Lockout Tagout and Tryout that emphasize safe operation procedures and awareness of the dangers associated with the equipment. Regular safety audits could help ensure compliance with safety protocols.
- **Personal Protective Equipment (PPE):** Provide cut-resistant gloves that can minimize injury if a hand does come in contact with the sharp items in the baler, though this is the least effective solution compared to others.

Regulatory Requirements

Relevant Safety Regulations Pertaining to Machine Guarding

- OSHA 1910.212: General requirements for all machines, including machine guarding.
- Industry-Specific Standards: Specific regulations for woodworking machines, abrasive wheel machinery, power presses, and other equipment.
- Purpose of Regulations: To protect workers from injuries caused by hazardous machine parts.
- Key Requirements:
 - Point of Operation Guarding: Guarding of areas where work is performed on materials.
 - Power Transmission Guarding: Guarding of rotating parts such as pulleys, belts, and gears.
 - Hazardous Non-Power-Transmission Parts: Guarding of other hazardous parts of machines.
 - Control and Disconnect Devices: Ensuring safe operation and shutdown of machines.
 - Special Purpose Machines: Addressing specific guarding requirements for specialized equipment.
- Compliance: Adherence to these regulations is essential for workplace safety and legal compliance.

Hazard Mitigation Strategies



- **Safeguarding Machinery:** Installing additional safety features such as fencing, lockout tags, and warning signs.
- **Regular Inspections:** Conducting regular inspections of machine guards to ensure they are in good condition and functioning properly.
- **Training:** Providing workers with proper training on the safe operation and maintenance of machinery.
- **Risk Assessment:** Conducting regular risk assessments to identify potential hazards and implement appropriate mitigation measures.

Types of Machine Guards

- **Fixed Guards:** Permanently attached guards that provide physical barriers between workers and hazardous machine parts.
- **Interlocked Guards:** Guards that are mechanically interlocked with the machine's operating mechanism, preventing operation when the guard is open.
- **Presence Sensing Devices:** Devices that detect the presence of a worker near a machine and automatically stop the machine if a worker is detected.
- **Two-Hand Control:** Requiring the operator to use both hands to activate the machine, preventing accidental operation.
- **Emergency Stop Buttons:** Easily accessible emergency stop buttons that can quickly stop the machine in case of an emergency.



Maintenance and Inspection Protocols

Regular Maintenance and Inspection Procedures

- **Regular Inspections:** Conduct regular inspections of machine guards to ensure they are in good condition and functioning properly.
- ~~**Inspection Frequency:** Establish a schedule for inspections based on the type of machine and the level of risk.~~
- ~~**Inspection Checklist:** Use a detailed inspection checklist to ensure that all critical components are examined.~~
- **Maintenance:** Address any maintenance issues identified during inspections, such as repairs, lubrication, or replacement of parts.
- **Training:** Ensure that workers are trained on how to properly inspect and maintain machine guards.
- **Lockout/Tagout Procedures:** Follow lockout/tagout procedures to prevent accidental startup during maintenance or inspection.
- **Corrective Actions:** Implement timely corrective actions to address any identified hazards or deficiencies.
- **Documentation:** Maintain records of inspections, maintenance, and corrective actions.



Mastering the Line of Fire

Story

- Recently an equipment operator was fatally crushed by a frontend loader.



Story

A lesson in Ergonomics

Contributing Factors:

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Prevention Strategies:

- **Ergonomic Training:** Educating workers on proper lifting techniques and body mechanics.
- **Workstation Design:** Adjusting workstations to be at a comfortable height and reducing the need for excessive bending or twisting.
- **Job Rotation:** Rotating tasks among workers to minimize repetitive strain on any one body part.
- **Regular Breaks:** Encouraging workers to take short breaks to stretch and rest their muscles.

Common Hazards

- **Pinch Points:** Areas where machine parts come together or overlap, creating a risk of crushing injuries.
- **Entanglement Hazards:** Rotating parts, chains, and belts that can cause workers to become entangled.
- **Projections:** Sharp edges, corners, or protruding parts that can cause cuts or lacerations.
- **Flying Objects:** Debris, fragments, or other objects that can be ejected from machines.



Hazard Identification Techniques

How to Recognize and Assess Potential Hazards

- **Visual Inspection:** Carefully examine machines and work areas for potential hazards, such as pinch points, entanglement hazards, and projections.
- **Job Hazard Analysis (JHA):** Conduct a systematic review of tasks to identify potential hazards and develop preventive measures.
- **Safety Audits:** Conduct regular safety audits to identify and address hazards.
- **Employee Input:** Encourage employees to report any potential hazards they observe.
- **Hazard Recognition Training:** Provide workers with training on how to recognize and avoid common hazards.
- **Risk Assessment:** Conduct regular risk assessments to identify potential hazards and prioritize mitigation efforts.
- **Safety Signs and Warnings:** Use clear and concise safety signs and warnings to alert workers to potential hazards.
- **Regular Inspections:** Conduct regular inspections of machines and work areas to identify and address hazards.

Safe Work Practices



- **Lockout/Tagout Procedures:** Follow proper lockout/tagout procedures to prevent accidental startup of machines.
- **Guard Usage:** Ensure that all machine guards are in place and functioning properly.
- **Safe Distances:** Maintain safe distances from moving machine parts.
- **Avoid Distractions:** Avoid distractions that could lead to accidents.
- **Proper Tools and Equipment:** Use the correct tools and equipment for the job.
- **Protective Clothing:** Wear appropriate protective clothing, such as safety glasses and gloves.
- **Emergency Procedures:** Be familiar with emergency procedures and know how to respond to accidents.
- **Training:** Ensure that workers are properly trained on safe work practices and hazard identification.
- **Communication:** Communicate with coworkers to avoid accidents and misunderstandings.
- **Report Hazards:** Report any potential hazards or unsafe conditions to supervisors.

Safety Culture Keys

Importance of Safety Culture

Role of a Strong Safety Culture in Preventing Accidents

- **Reduced Accidents and Injuries:** A strong safety culture can significantly reduce the number of accidents and injuries in the workplace.
- **Improved Employee Morale:** Employees who feel safe and valued are more likely to be satisfied with their jobs and have higher morale.
- **Increased Productivity:** A safe and healthy workplace can lead to improved productivity and efficiency.
- **Reduced Costs:** Accidents and injuries can be costly to a business, both in terms of direct costs and lost productivity. A strong safety culture can help to reduce these costs.
- **Positive Reputation:** A company with a strong safety culture can develop a positive reputation in the community.
- **Legal Compliance:** A strong safety culture can help a company to comply with safety regulations and avoid legal issues.
- **Employee Engagement:** A safety culture that encourages employee involvement and participation can lead to greater employee engagement and ownership.
- **Continuous Improvement:** A strong safety culture promotes a culture of continuous improvement, with a focus on identifying and addressing hazards.

Leadership Commitment

- **Visible Support:** Leaders should visibly support safety initiatives and demonstrate their commitment to creating a safe working environment.
- **Clear Expectations:** Leaders should set clear expectations for safety performance and hold employees accountable for following safety procedures.
- **Safety Training:** Leaders should ensure that employees receive adequate safety training and education.
- **Resource Allocation:** Leaders should allocate sufficient resources to support safety initiatives, including equipment, training, and personnel.
- **Safety Recognition:** Leaders should recognize and reward employees for their contributions to safety..
- **Safety Audits:** Leaders should conduct regular safety audits to identify and address hazards.
- **Proactive Approach:** Leaders should take a proactive approach to safety, rather than waiting for accidents to occur.
- **Communication:** Leaders should communicate effectively with employees about safety issues and concerns.
- **Role Modeling:** Leaders should model safe behavior themselves and set a positive example for their employees

Employee Engagement



- **Safety Committees:** Encourage employees to participate in safety committees and provide input on safety issues.
- **Safety Training:** Provide employees with opportunities to participate in safety training and education.
- **Hazard Reporting:** Encourage employees to report any potential hazards or unsafe conditions they observe.
- **Safety Inspections:** Involve employees in safety inspections and audits.
- **Safety Recognition:** Recognize and reward employees for their contributions to safety.
- **Safety Celebrations:** Celebrate safety achievements and milestones.
- **Employee Suggestion Programs:** Encourage employees to submit suggestions for improving safety.
- **Safety Communication:** Provide employees with regular updates on safety initiatives and performance.
- **Open Communication:** Create an open and supportive environment where employees feel comfortable raising safety concerns.

Continuous Improvement

- **Safety Audits:** Conduct regular safety audits to identify potential hazards and areas for improvement.
- **Data Analysis:** Analyze safety data to identify trends and patterns.
- **Root Cause Analysis:** Investigate accidents and incidents to determine the underlying causes.
- **Corrective Actions:** Implement corrective actions to address identified hazards and prevent future incidents.
- **Preventative Measures:** Implement preventative measures to address potential hazards before they occur.
- **Employee Feedback:** Seek feedback from employees to identify areas for improvement.
- **Safety Training:** Provide ongoing safety training and education to keep employees informed and up-to-date.
- **Benchmarking:** Compare safety performance to industry benchmarks and best practices.
- **Safety Goals:** Set clear safety goals and objectives.
- **Review and Revise:** Regularly review and revise safety plans and procedures to ensure they remain effective.



Conclusion

Join us for our next webinar!

State of Safety: Reflecting on 2024 and Preparing for 2025

December 11th at 1pm EST

Join safety expert Zach Pucillo as he provides an in-depth analysis of the State of Safety for 2024. Zach will discuss pivotal regulatory updates and highlight trending safety topics that shaped the year. Additionally, he will offer insights into upcoming considerations for 2025 and share essential best practices for starting the new year on a safe and compliant note.

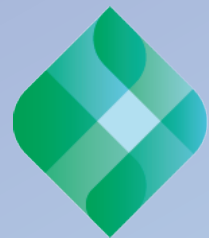
Attendees will gain insights into:

- Key safety trends observed throughout 2024
- Updates on regulatory changes and noteworthy news from the year
- Anticipated developments and challenges expected in 2025
- Best practices to ensure ongoing safety and compliance



Zach Pucillo CSP, CHMM
KPA | EHS Compliance Manager

Q&A



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Thank you!

**Recording & slides will be sent
out after the webinar.**

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