



Engineering Control

Introduction:

Engineering controls are essential safety measures that eliminate hazards or create barriers to reduce workers' exposure to dangerous machinery and high-risk areas. These measures can include physical changes like barriers, access restrictions, and automated shutoff systems. Implementing these controls helps reduce the likelihood of accidents and injuries, promoting a safer and more efficient work environment.

Discussion Points:

- Overview of Engineering Controls.
- Types of Engineering Controls.
- Implementation Strategies.
- Assessment and Effectiveness.
- Continuous Improvement.

Discussion:

Engineering controls involve implementing physical changes to the workplace or equipment to separate people from hazards. Their purpose is to eliminate dangers or to create effective barriers that significantly reduce workers' exposure to dangerous machinery and its components. These controls can include physical barriers, access restrictions, and automated safety systems.

Physical barriers encase moving parts, preventing accidental contact and potential injury. Access restrictions ensure that machinery cannot operate unless specific safety conditions are met, which helps prevent activation while it is still hazardous. Automated shutoff systems engage in certain hazardous conditions, stopping operations before accidents can occur.

Physical Barriers

- Guardrails and Handrails: Block falls from high places.
- Machine Guards: Cover moving parts on tools that fingers could touch.
- Acoustic Shields: Block loud noise from traveling across a room.
- Welding Curtains: Stop bright light and sparks from traveling across a room.
- Perimeter Fences and Walls: Fencing used to keep unauthorized personnel away from high-risk areas.
- Pedestrian Walkway Segregation: Bollards, curbing, or barriers to separate walkways from roadways.
- Interlocking Safety Devices: Automated electromechanical systems that cut power to dangerous devices.
- Presence-Sensing Optoelectronic Barriers: Light curtains and laser scanners that create invisible barriers.



- Physical & Electronic Access Control Systems: Devices that limit entry to trained, qualified personnel.

Access Restrictions

- Interlocks: Shut down machines automatically if a safety gate opens.
- Turnstiles and Gates: Restrict entry to dangerous zones, such as high-voltage areas.
- Pedestrian Aisles: Painted lines or fences used to separate people from moving forklifts.
- Keycard Systems: Limit room access to trained staff only.

Emergency stop controls, commonly known as E-stops, are essential engineering control designed to immediately stop machine operations in the event of a malfunction or safety concern. These controls should be easily accessible and clearly labeled to ensure they can be activated quickly during an emergency.

Implementing physical barriers provides distinct operational advantages over lower safety tiers:

- Minimizes Human Error
- Controls Risks at the Source
- Lowers Long-Term Costs
- Continuous Protection

Implementing engineering controls significantly reduces the likelihood of accidents and injuries. By proactively identifying and addressing potential hazards through these physical measures, we can eliminate or reduce risks at their source, leading to a safer work environment. Understanding and applying these engineering controls also helps ensure compliance with machine safety rules and regulations. While maintaining machine safety is a collective responsibility, effective engineering controls can significantly lower risk.

As always, stay safe out there!