

Welcome and Objectives

- Learning Objectives.
- Systematic approaches to identifying hazards in the workplace using tools like checklists, inspections, and risk assessments.
- Identify various types of workplace hazards.
- Use structured techniques for hazard identification.
- Document and communicate identified hazards effectively.



Risk Management in Practice

Lecture Title:
Hazard Identification Techniques

Lecturer: Chris Camilleri

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Undergraduate Diploma in
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Systematic Techniques for Hazard Identification

What comes to mind?

Systematic techniques for hazard identification are structured, repeatable methods used to proactively uncover potential risks in a workplace or process. These techniques rely on logic, analysis, and collaboration to ensure hazards are not missed due to oversight or bias.



Tool	Purpose	Key Features
Checklists	Guide hazard identification in a consistent manner	Standardized format for identifying hazards Lists common risks by task, area, or equipment Prevents oversight through structured prompts
Inspections	Detect existing or potential hazards through observation	Physical examination of workplace, equipment, and processes Can be scheduled or unscheduled Conducted by trained personnel
Risk Assessments	Evaluate and prioritize hazards based on risk level	Analyze likelihood and severity of harm Prioritize risks and determine control measures Reviewed periodically or after workplace changes
Why This Matters	Ensures a comprehensive and effective safety management system	Comprehensive hazard coverage Consistent hazard identification and management Legal and regulatory compliance Promotes safety culture

Consistency and Reliability

- o Systematic techniques ensure that hazard identification is repeatable and consistent, reducing the chance of overlooking risks.
- o They provide a standardized framework that can be applied across different teams, shifts, or sites.

Comprehensive Coverage

- o Structured methods like RAMS or HAZOP help uncover both obvious and hidden hazards, including those that may not be immediately visible or intuitive.
- o They encourage a step-by-step review of tasks, processes, and environments.

Why systematic techniques are preferred over informal methods?



Prioritization of Risks

- o Systematic methods often include risk rating or ranking, which helps organizations focus on high-consequence hazards first.
- o This supports efficient resource allocation for controls and mitigation.

Improved Communication and Collaboration

- o Techniques like team-based HAZOPs or safety audits foster cross-functional collaboration, bringing together diverse perspectives.
- o They create a shared understanding of risks among workers, supervisors, and safety professionals.



Continuous Improvement

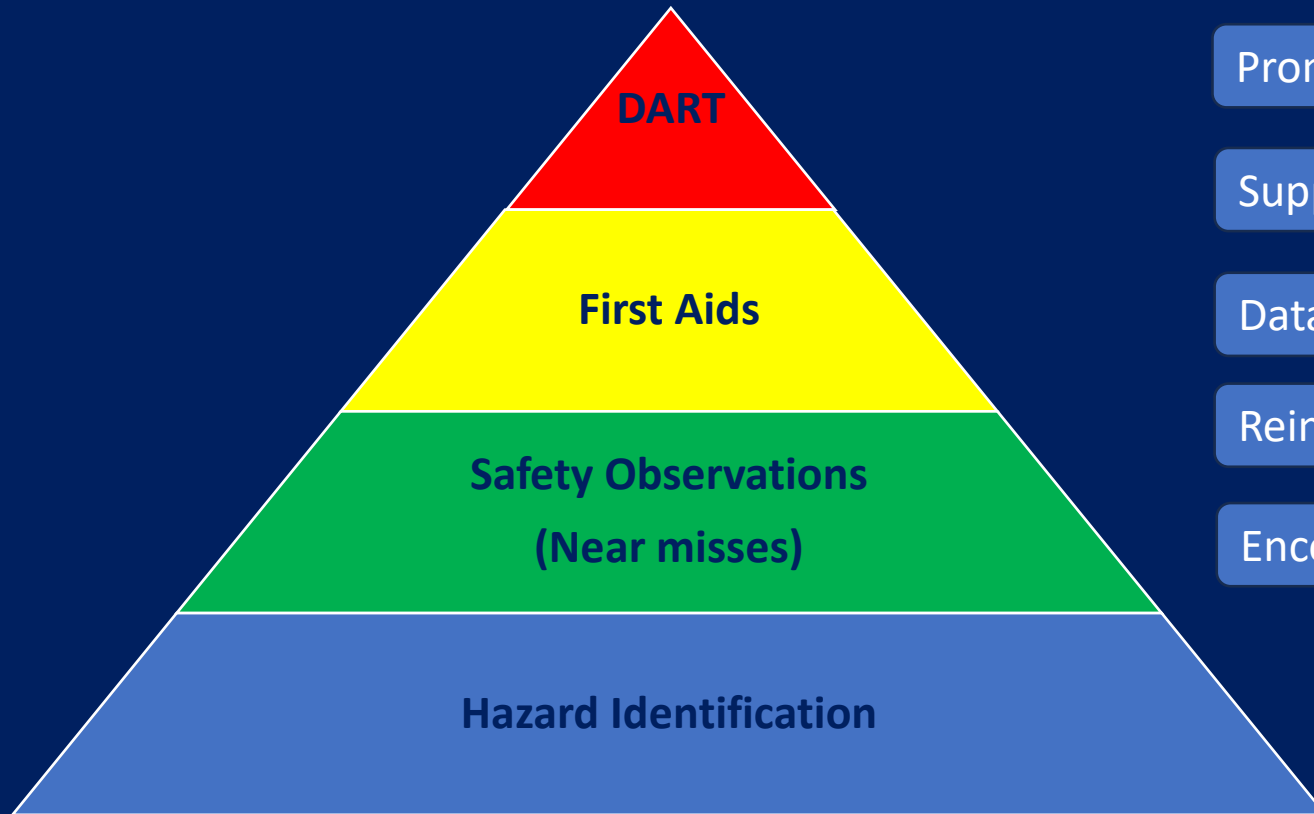
- o Systematic approaches allow for tracking and trending of hazards over time.
- o They support incident investigations, root cause analysis, and updates to procedures based on lessons learned.

Enhanced Safety Culture

- o When hazard identification is embedded in daily routines (e.g., toolbox talks, inspections), it promotes a proactive safety mindset.
- o Workers become more engaged and aware, contributing to a positive safety culture.



Safety Triangle



Promote Proactive Hazard Identification

Supports Systematic Techniques

Data-Driven Techniques

Reinforces Continuous Improvement

Encourages Reporting Culture

How This Supports a Systematic Approach

- 1) **Structured Roles:** Each level has a defined responsibility, ensuring no gaps in hazard identification.
- 2) **Consistency:** Tools like checklists and inspections are applied uniformly across the organization.
- 3) **Feedback Loops:** Information flows from the ground up and top down, enabling continuous improvement.
- 4) **Culture of Safety:** Promotes proactive identification and resolution of hazards, not just reactive responses.



Group	Role in Hazard Identification
Associates	<ul style="list-style-type: none">- Observe and report hazards in real-time- Follow safe work practices- Participate in checklists and inspections
Supervisors & Managers	<ul style="list-style-type: none">- Coach teams on hazard recognition- Conduct regular inspections- Ensure checklists and risk assessments are used effectively
Site Leadership	<ul style="list-style-type: none">- Drive a safety-first culture- Allocate resources for systematic inspections and assessments- Review and act on risk data
Senior Leadership	<ul style="list-style-type: none">- Set the vision for zero harm- Embed hazard identification into strategic goals- Ensure systems and tools (e.g., checklists, audits) are in place

Five steps to Risk Assessment



Identify Hazards

Recognize potential sources of harm in the workplace to prevent accidents and injuries.



Assess Who Is Harmed

Determine who may be affected by the hazards and how they might be harmed.



Evaluate Risks and Precautions

Analyze risk levels and decide on appropriate control measures to reduce harm.



Record and Implement

Document findings clearly and put safety measures into practice to protect workers.



Review and Update

Continuously monitor and improve the risk assessment to ensure ongoing safety.

ACCOUNTABILITY

The Importance of Accountability Process



1. What is a hazard in the context of occupational health and safety?
2. Why is hazard identification considered the foundation of risk management?
3. Can all hazards be seen or easily recognized?
4. Who is responsible for identifying hazards in the workplace?
5. What are the consequences of failing to identify hazards?

6. What methods do you know for identifying hazards?
7. How do hazard identification techniques differ across industries?

Why these questions are essential ?

Hazard identification is the **first and most critical step** in occupational health and safety. It involves recognizing sources, situations, or behaviors that could potentially cause harm. This process lays the foundation for effective risk management and accident prevention.



Hazard vs Risk

HAZARD

A source or situation with the potential for harm in terms of injury or ill health.



RISK

The likelihood that a person may be harmed or suffer adverse health effects if exposed to a hazard



Types of Hazards in the Workplace

Physical Risks

Physical risks include hazards like noise and heat that can harm workers' health and safety.

Chemical Risks

Chemical risks involve exposure to toxins and fumes that can cause serious health issues.

Biological Risks

Biological risks cover viruses, bacteria, and other pathogens that threaten employee health.

Ergonomic Risks

Ergonomic risks arise from repetitive strain and poor posture causing musculoskeletal problems.

Psychosocial Risks

Psychosocial risks include stress and bullying, impacting mental wellbeing and productivity.

Definition and Importance

Hazard Identification Process

Recognizing potential sources of harm is essential for preventing workplace incidents effectively and proactively.

Prevention of Injuries and Illness

Timely hazard identification enables interventions that reduce injuries, illnesses, and fatalities in the workplace.

Regulatory Compliance and Safety Culture

Hazard identification supports legal compliance and fosters a strong organizational safety culture for operational efficiency.

Role of Safety Professionals

Health and safety professionals systematically identify hazards and ensure control measures are implemented and kept effective.



Legal and Organizational Responsibilities

Legal Obligations

Organizations must comply with occupational health and safety laws to identify and manage hazards effectively.

Hazard Identification

Regular risk assessments and safe work environments are essential to detect and mitigate potential workplace hazards.

Roles and Responsibilities

Employers and health professionals must integrate safety processes and promote hazard reporting among employees.

Consequences of Non-compliance

Failing to meet safety responsibilities can cause legal

Hazard Identification Risk Program



Hazard identification techniques vary significantly across industries due to differences in work environments, processes, materials, and risks.



Construction Industry

- Common Hazards:

Falls from height, struck-by incidents, electrical hazards, trench collapses.

- Techniques Used:

- Daily Toolbox Talks to discuss site-specific hazards.
- Site Safety Walks and visual inspections.
- Permit-to-Work Systems for high-risk activities.
- RAMS for each task.

- Why It's Unique:

Dynamic and constantly changing environments require frequent reassessment.



Manufacturing & Industrial Settings

- Common Hazards:

Machinery entanglement, chemical exposure, noise, repetitive strain

- Techniques Used:

- Process Hazard Analysis (PHA)
- Lockout/Tagout (LOTO) Audits.
- Routine Equipment Inspections.

- Why It's Unique:

High reliance on mechanical systems and automation requires technical hazard identification.



Healthcare Sector

- Common Hazards:

Biological agents, sharps injuries, patient handling, stress.

- Techniques Used:

- Infection Control Risk Assessments.
- Incident Reporting Systems.
- Ergonomic Assessments for manual handling

- Why It's Unique:

Hazards often involve human interaction and biological risks



Chemical (pharma) Industry

- Common Hazards:

Toxic releases, fire/explosion, corrosive substances

- Techniques Used:

- HAZOP and Event Tree Analysis (ETA).
- Safety Data Sheet (SDS) Reviews.
- Emergency Response Drills.

- Why It's Unique:

High-risk processes demand rigorous and systematic hazard identification.



Office and administrative Environments

- Common Hazards:

Ergonomic issues, slips/trips, fire safety, psychosocial risks.

- Techniques Used:

- Ergonomic Assessments.
- Stress and Mental Health Surveys.
- Fire Risk Assessments.

- Why It's Unique:

Hazards are often less visible and more related to long-term health.



Transport & Logistics

- Common Hazards:

Vehicle collisions, manual handling, fatigue

- Techniques Used:

- Driver Safety Audits.
- Journey Risk Assessments.
- Fatigue Management Programs.

- Why It's Unique:

Mobile work environments and time pressures influence hazard types



Using Checklists



Purpose of Checklists

Checklists systematically review known workplace hazards to ensure no critical safety areas are missed.



Advantages of Checklists

Checklists offer ease of use and help standardize hazard identification across teams and shifts.



Limitations and Updates

Checklists may miss emerging unique hazards; regular updates and customization maintain effectiveness.

Examples of Checklist



Safety Inspection Checklist



Category	Item/Task	Status
General Safety Workplace conditions	- Clean and orderly	☐
	- Adequate lighting	☐
	- Unobstructed pathways	☐
Emergency Exits Exit signs and paths	- Clear exit signage	☐
	- Unblocked emergency exits	☐
	- Emergency lighting functional	☐
Fire Safety Fire prevention measures	- Fire extinguishers available and checked	☐
	- Fire alarms and detectors functional	☐
	- No storage blocking fire exits	☐
Equipment Safety Machinery and tools	- Machines properly guarded	☐
	- Equipment well-maintained	☐
	- Lockout/tagout procedures	☐
Hazardous Materials Chemical handling and storage	- Proper storage and labeling	☐
	- MSDS sheets accessible	☐
	- Employee training	☐
Personal Protective Equipment (PPE) Safety gear	- PPE available and used	☐
	- Eye, ear, head, and hand protection	☐
	- Respiratory protection (if needed)	☐
First Aid First aid stations and supplies	- Accessible first aid stations	☐
	- Fully stocked first aid kits	☐
Safety Training Employee safety training	- Safety orientation for new hires	☐
	- Regular safety training programs	☐
Environmental Environmental concerns	- Waste disposal procedures	☐
	- Environmental hazards identified	☐
	- Compliance with regulations	☐

SAFETY CHECKLIST

HOUSEKEEPING

- Walkways and exits clear
- Floors free of spills and tripped hazards
- Floors free of spills and tripping hazards
- Tools and equipment properly stored

PERSONAL PROTECTIVE EQUIPMENT

- PPE available and in good condition
- Employees wearing required PPE
- PPE properly stored when not in use

EQUIPMENT AND MACHINERY

- Machines guarded and maintained
- Lockout/tagout procedures followed
- Operators trained and authorized

FIRE SAFETY

- Fire extinguishers accessible
- Emergency exits clearly marked
- Alarms and sprinklers operational

CHEMICAL SAFETY

- Containers labeled and stored safely
- Safety data sheets (SDS) available
- Spill kits accessible and stocked

ELECTRICAL SAFETY

- Electrical cords in good condition
- Proper grounding of equipment
- No daisy-chaining of power strips

EMERGENCY PREPAREDNESS

- First aid kits fully stocked
- Emergency numbers posted
- Employees trained on procedures

Conducting Workplace Inspections



Types of Inspections

Workplace inspections can be formal or informal, involving scheduled or spontaneous hazard checks by trained personnel.

Inspection Process

Effective inspections require planning, execution, documentation, and follow-up to ensure hazards are identified and managed.

Common Hazards Found

Typical hazards include blocked emergency exits, improper storage, and malfunctioning equipment discovered during inspections.

Follow-Up Actions

Follow-up actions involve immediate correction, reporting, or risk assessment to maintain workplace safety standards.

Why Conducting workplace inspections by safety-competent personnel is essential in hazard identification techniques?

Reason	Explanation
Expertise in Spotting Hazards	Competent individuals can identify both visible and hidden hazards due to their training and experience.
Ensures Accuracy and Credibility	Their inspections are thorough and trusted by management and regulators.
Legal and Regulatory Compliance	Many safety standards require inspections by qualified personnel to meet legal obligations.
Facilitates Effective Risk Assessment	Accurate hazard identification enables better risk evaluation and prioritization.
Promotes a Proactive Safety Culture	Regular inspections show commitment to safety and encourage employee engagement.
Enables Timely Corrective Actions	Safety professionals can recommend practical solutions and ensure prompt action.
Enhances Training and Awareness	Inspections serve as learning opportunities and help educate staff on safety practices.

Why Conducting workplace inspections by non safety-competent personnel (process owner) is essential in hazard identification techniques?



Reason	Explanation
Familiarity with Processes	Process owners understand the workflow deeply and can spot process-specific hazards.
Early Detection of Hazards	Their constant presence allows them to notice subtle changes or emerging risks quickly.
Promotes Employee Engagement	Involving them fosters shared responsibility and builds a proactive safety culture.
Practical Solutions	They can suggest feasible corrective actions based on operational realities.
Continuous Improvement	Regular involvement sharpens their safety awareness over time.
Cost-Effective	Using internal personnel reduces reliance on external consultants while maintaining safety standards.

Risk Assessments



Stepwise Hazard Identification

Risk Assessments breaks down jobs into tasks to identify hazards at each step for overall safety improvement.

Typical Workplace Hazards

Common hazards include manual handling injuries, equipment collisions, and falling objects in jobs like pallet stacking.

Control Measures and Safety

Control measures such as training, PPE use, and improved layout design reduce risks and ensure safer work environments.

Application in High-Risk Tasks

Risk Assessment is vital for high-risk tasks, aiding in safe procedure development and targeted employee training.

Other Techniques



Task Observation

Observing employees performing tasks helps identify unsafe practices and potential hazards in real time.

Incident and Near-Miss Analysis

Analyzing incidents and near misses uncovers hazards that caused or almost caused harm, aiding prevention.

Safety Audits

Comprehensive safety audits evaluate systems and practices, often led by external experts to improve safety.

Worker Feedback and Consultation

Engaging workers through feedback and consultation identifies hazards that may be overlooked by formal checks.

Safety Walks

Purpose of Safety Walks

Safety walks identify hazards in worker behavior, ergonomics, and equipment use through structured observations.

Informal and Frequent Checks

Safety walks are informal and frequent, enabling real-time hazard detection and immediate corrective action.

Use of Scoring Systems

Observers use scoring systems or checklists to prioritize follow-ups and track safety improvements over time.

Engagement and Culture Building

Safety walks foster employee engagement and reinforce safe work practices for continuous improvement.



Worker Interviews / Safety Conversations

Engaging Employees Directly

Direct engagement uncovers hidden hazards through workers' experiences and observations.

Structured Safety Dialogues

Using interview guides or feedback forms ensures key safety topics are covered.

Building Trust and Communication

Open communication encourages sharing of near-misses and unreported safety issues.

Using Insights for Improvements

Collected information updates safety procedures and enhances training programs.



Hazard Spotting Exercises

Interactive Group Training

Exercises engage employees in identifying hazards using images of real work environments.

Use of Visual Aids

Photos of workplace scenarios help participants spot potential risks actively.

Live Hazard Spotting

Teams walk through work areas to document and discuss observed hazards collaboratively.

Promoting Safety Culture

Exercises foster teamwork and critical thinking to build proactive safety culture.



Mobile Apps for Hazard Reporting

Real-Time Hazard Reporting

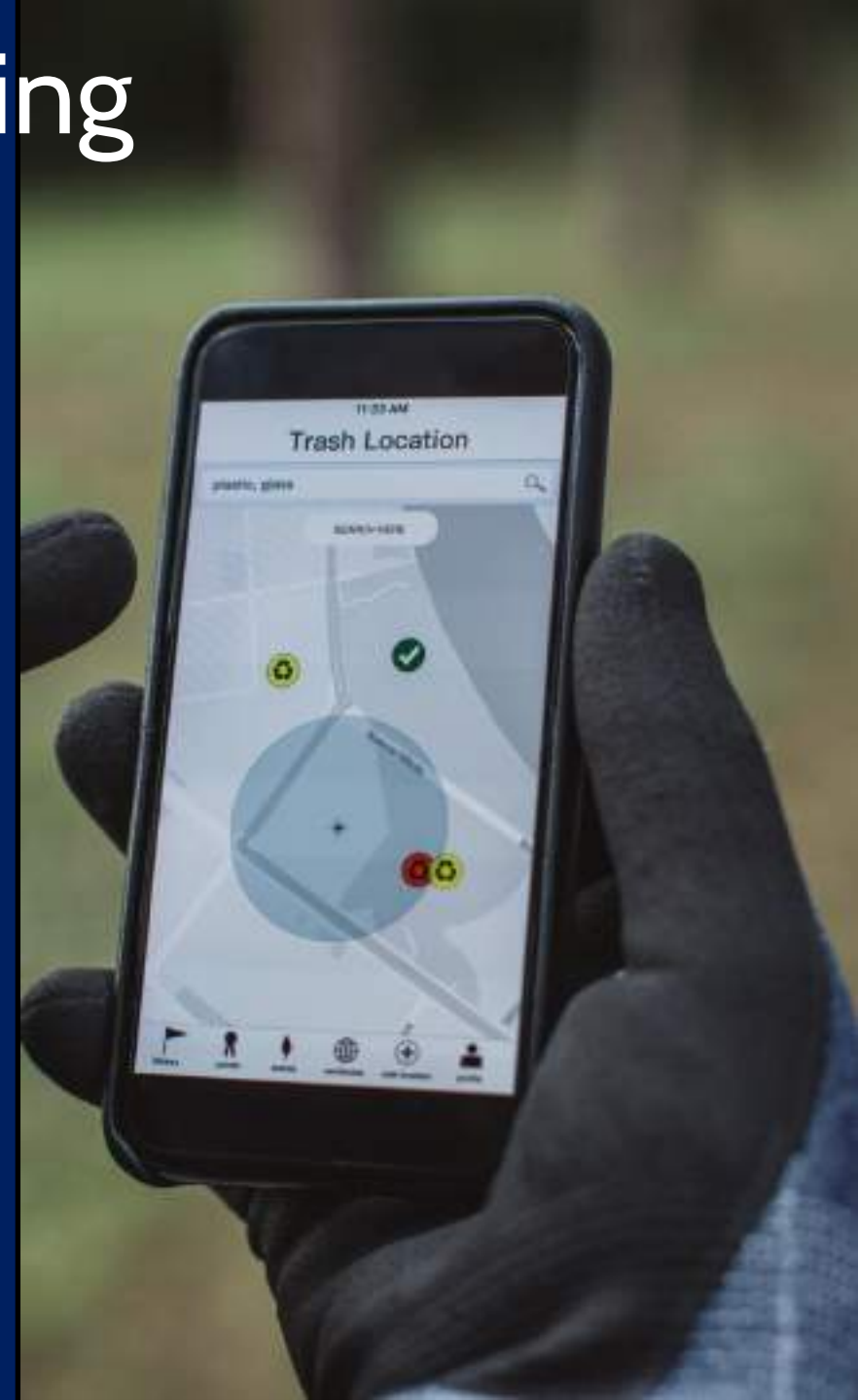
Apps enable workers to report hazards instantly with photo uploads and GPS tagging.

Data Collection and Analysis

Apps collect data to identify safety trends and prioritize corrective actions effectively.

Employee Empowerment

Encouraging app use empowers employees to take ownership of identifying hazards proactively.



CASE STUDIES





Construction Site – Fall from Height

Identified Fall Hazard

Missing guardrails on scaffolding create a serious fall risk for workers transporting materials.

Hazard Prevention Measures

Site safety walks, visual inspections, and risk assessments can prevent such hazards effectively.

Roles and Responsibilities

Safety officers, supervisors, and workers share responsibility for hazard identification and control implementation.

Control Strategies

Immediate guardrail installation and long-term inspections, training, and permit-to-work systems reduce risks.



Laboratory – Chemical Exposure

Incident Overview

A lab technician experienced dizziness due to chemical exposure from improper use of a fume hood.

Behavioral Failure

The root cause was deviation from safe operating procedures resulting in hazardous chemical exposure.

Hazard Identification Methods

Techniques like safety audits, behavior observations, and SOP reviews can help identify hazards early.

Importance of Training

Training and refresher courses reinforce safe procedures and reduce the risk of incident recurrence.



Manufacturing – Machine Guarding

Mechanical Hazard Incident

Bypassing a machine guard led to a near miss when a glove got caught in moving parts, illustrating mechanical hazards.

Hazard Identification Methods

Risk Assessment, incident trend analysis, task observation, safety inspections, and near-miss reporting help identify hazards early.

Balancing Safety and Productivity

Effective process design integrates safety into workflows, promoting a culture that values safety over speed.

Summary and Key Takeaways

Hazard Identification Techniques

Checklists, inspections, risk assessments and audits uncover risks before causing harm, essential for workplace safety.

Advanced Insight Methods

Task observation and incident analysis provide deeper understanding of potential hazards and their causes.

Documentation and Communication

Proper documentation and communication ensure hazards are addressed and safety info is shared across teams.

Collaborative Safety Culture

Everyone's involvement in hazard mitigation fosters a culture of safety and continuous workplace improvement.



Next: Lecture 4: Control Measures and Hierarchy of Controls

- Examines control strategies and the hierarchy of controls used to mitigate risks.
- Learning Objectives:
 - - Understand the hierarchy of controls.
 - - Evaluate effectiveness of different control measures.
 - - Implement appropriate controls in workplace settings

