

Risk Management in Practice

Lecture 4 : Hazard Identification and Workplace Assessment

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**Undergraduate Diploma in
Occupational Health and Safety**

Lecture Aim

- Understand how to identify risks at the place of work and different method of assessments

This lecture aims to develop learners' understanding of how to identify risks in the workplace and apply different methods of risk assessment. Students will learn to recognise hazards, assess potential impacts, and use structured assessment approaches such as generic, task-specific, noise, and chemical risk assessments to support safer work practices and effective risk control.



Lecture Overview

- **Purpose of Hazard Identification** :Hazard identification aims to recognise potential sources of harm early, allowing preventative actions to be implemented before incidents or injuries occur.
- **Importance of Workplace Assessments** :Workplace assessments help evaluate risks, prioritise controls, ensure legal compliance, and maintain a safe, healthy working environment for workers.
- **Hazard-Spotting Techniques**: Hazard-spotting techniques involve observation, inspections, consultation, and review of incidents to detect unsafe conditions and behaviours.
- **Job Safety Analysis (JSA)**:Job Safety Analysis systematically breaks tasks into steps to identify hazards, assess risks, and apply effective control measures.



What is a Hazard?

- A hazard is anything that has the potential to cause harm, injury, illness, damage to property, or harm to the environment.



Risk vs Hazard

Hazard = source of harm Risk = chance of harm

A hazard is anything with the potential to cause harm, such as unsafe equipment or hazardous substances. Risk refers to the likelihood that the hazard will cause harm and the severity of the consequences. Risk depends on factors such as exposure, frequency, and existing control measures in the workplace.



Why Hazard Identification Matters?

1. Prevents workplace injuries and illnesses – Identifying hazards early allows controls to be implemented before workers are exposed to harm.
2. Reduces accidents and near misses – Proactive hazard identification helps eliminate unsafe conditions that commonly lead to incidents or accidents.
3. Helps identify risks before harm occurs – Recognising hazards in advance enables preventative action rather than reacting after an incident.
4. Supports legal and regulatory compliance – Meeting OHS obligations requires systematic identification and management of workplace hazards.
5. Improves workplace safety culture – Encourages worker involvement and awareness, promoting shared responsibility for safety.
6. Protects workers, equipment, and property – Reducing hazards minimises damage, injuries, and costly repairs or replacements.
7. Reduces downtime and financial losses – Fewer incidents lead to uninterrupted operations and lower compensation and insurance costs.
8. Enables effective risk control measures – Accurate hazard identification ensures appropriate and targeted controls are selected.



Types of Workplace Hazards

Physical hazards

Chemical hazards

Biological hazards

Ergonomic hazards

Psychosocial hazards

Environmental Hazards

Thermal Hazards

Mechanical and Equipment Hazards

Process Hazard

Organisational Hazards



Physical Hazards

Physical Hazards – Definition :Physical hazards are workplace conditions or factors that can cause harm to workers through physical exposure or environmental conditions. These hazards often result in injury or illness due to contact with energy sources, unsafe environments, or physical forces that affect the body during work activities.

Examples of Physical Hazards:

- Excessive workplace noise
- Slips, trips, and falls
- Extreme heat or cold
- Vibration from tools or machinery
- Poor lighting conditions
- Radiation exposure
- Moving vehicles or equipment
- Confined or restricted spaces
- Electrical Hazards
- Fire Hazards



Chemical Hazards

Chemical Hazards – Definition

Chemical hazards are substances that can cause harm to health or safety through inhalation, skin contact, ingestion, or injection. They may be present as gases, vapours, liquids, solids, dusts, or fumes and can cause acute or long-term health effects if not properly controlled.

Examples of Chemical Hazards:

- Toxic gases and vapours
- Cleaning chemicals and solvents
- Flammable liquids
- Acids and corrosive substances
- Dusts and airborne particles
- Pesticides and herbicides
- Welding fumes
- Chemical spills or leaks



Biological Hazards

Biological Hazards – Definition

Biological hazards are biological substances or organisms that can cause illness, infection, or allergic reactions in workers. These hazards arise from exposure to bacteria, viruses, fungi, parasites, or biological materials commonly found in healthcare, agriculture, laboratories, and waste-handling environments.

Examples of Biological Hazards:

- Bacteria and viruses
- Blood and bodily fluids
- Moulds and fungi
- Animal bites or scratches
- Insect stings
- Contaminated food or water
- Medical or biological waste
- Human or animal bodily tissues



Ergonomics Hazards

Ergonomic Hazards – Definition

Ergonomic hazards arise from poor workplace design or work practices that place strain on the body. They can cause musculoskeletal injuries by forcing workers into awkward postures, repetitive movements, excessive force, or prolonged static positions during tasks, leading to discomfort, fatigue, or long-term injury.

Examples of Ergonomic Hazards:

- Incorrect Manual handling of heavy loads
- Repetitive tasks or movements
- Awkward or sustained postures
- Poor workstation or equipment design
- Prolonged sitting or standing
- Excessive reaching or bending
- Poorly designed tools
- Inadequate task rotation



Psychosocial Hazards

Psychosocial Hazards – Definition

Psychosocial hazards are aspects of work design, organisation, and social interactions that may cause psychological or emotional harm to workers. These hazards can negatively affect mental health, wellbeing, and job performance, leading to stress, anxiety, fatigue, or depression. Psychosocial hazards often result from poor management practices, excessive demands, or negative workplace behaviours.

Examples of Psychosocial Hazards:

- High workload or work pressure
- Workplace bullying or harassment
- Lack of job control
- Poor communication or support
- Fatigue from long working hours
- Job insecurity
- Exposure to traumatic events
- Work-related stress
- Workplace Isolation



Environment Hazards

Workplace Environmental Hazards – Definition (50 words):

Workplace environmental hazards are conditions within the work environment that can negatively affect workers' health and safety. These hazards arise from physical surroundings, infrastructure, or environmental exposure and can increase the risk of injury, illness, or long-term health effects if not properly managed.

Examples of Workplace Environmental Hazards:

- Poor lighting
- Inadequate ventilation
- Extreme temperatures
- Excessive noise/ vibration levels
- Wet or uneven floors
- Exposure to weather conditions
- Poor air quality
- Confined or poorly designed spaces
- Hot surfaces



Thermal Hazards

Thermal Hazards – Definition (50 words):

Thermal hazards are workplace conditions that expose workers to extreme heat or cold, potentially causing burns, heat stress, hypothermia, or other temperature-related injuries. These hazards often arise from hot surfaces, steam, fire, cold environments, or processes involving high or low temperatures.

Examples of Thermal Hazards:

- Hot machinery or surfaces
- Steam or hot liquids
- Fire and explosions
- Working in cold storage areas
- Exposure to extreme weather
- Molten materials



Mechanical & Equipment Hazards

Mechanical and Equipment Hazards – OHS Definition (70 words):

Mechanical and equipment hazards in occupational health and safety arise from machinery, tools, or equipment that can cause injury due to movement, malfunction, misuse, or poor maintenance. These hazards often involve moving parts, stored energy, or mechanical failure and can result in cuts, crushing injuries, entanglement, or amputations if not properly controlled.

Examples of Mechanical and Equipment Hazards:

- Unguarded moving machinery parts
- Pinch and nip point
- Sharp blades or cutting tools
- Faulty or poorly maintained equipment
- Unexpected equipment start-up
- Pressurised systems or stored energy
- Entanglement in rotating machinery
- Inadequate machine guarding



Process Hazards

Process hazards are conditions or events in industrial operations that can lead to fires, explosions, toxic releases, or other dangerous incidents. They arise from the inherent properties of materials, equipment, or processes and can cause harm to people, property, or the environment. Identifying and managing them is critical for safe chemical and industrial operations.

Practical examples may include:

- Chemical spills
- Flammable gas leaks
- Boiler explosions
- Overpressure in reactors
- Toxic gas release
- Electrical sparks in hazardous areas
- Mechanical equipment failure
- Runaway chemical reactions



Organisational Hazards

Organisational Hazards – Definition

Organisational hazards in occupational health and safety arise from the way work is planned, managed, and structured within an organisation. Poor organisational practices can increase stress, fatigue, errors, and the likelihood of incidents, negatively affecting worker health, wellbeing, and overall workplace safety performance.

Examples of Organisational Hazards:

- Poor work scheduling
- Inadequate staffing levels
- Lack of training or supervision
- Unclear roles and responsibilities
- Excessive workload demands
- Ineffective communication systems
- Poor safety leadership
- Inadequate policies or procedures



Hazards Spotting Techniques

1. Stop and observe the work area before starting
2. Scan the area systematically (left to right, top to bottom)
3. Identify unsafe acts and unsafe conditions
4. Break the job into steps (Job Safety Analysis)
5. Ask “What if?” questions for each task
6. Look for changes in people, equipment, or environment
7. Use hazard categories (physical, chemical, biological, ergonomic, etc.)
8. Check for uncontrolled energy sources (electricity, movement, pressure, heat)
9. Review past accidents and near-miss reports
10. Observe how work is actually being done
11. Conduct regular walk-through inspections
12. Use checklists and pre-start inspections
13. Involve workers in hazard identification
14. Reassess hazards during and after the task
15. Take immediate action to control high-risk hazards



Observing Work Activity

Observing work activity to spot hazards involves watching how tasks are actually performed, not just how they are written in procedures. The observer looks for unsafe actions, unsafe conditions, poor body posture, improper use of tools, and missing protective equipment. Attention is given to movements, work pace, shortcuts, and interactions between workers, machines, and the environment. Changes in conditions such as noise, lighting, weather, or fatigue are also considered. By observing real work practices, hidden risks and near-miss situations can be identified early, allowing corrective actions to be taken before accidents or injuries occur.

<https://www.youtube.com/watch?v=wpiSpt7YyPU>



Unsafe Work Conditions

Poor Housekeeping – Cluttered floors, spills, or scattered materials can cause slips, trips, and falls.

Faulty Machinery or Equipment – Damaged tools, worn parts, or missing guards increase the risk of injury.

Inadequate Lighting – Poor visibility can lead to mistakes, trips, or improper equipment use.

Exposed Electrical Wiring – Open cables or damaged insulation can cause electric shock or fire.

Slippery or Uneven Surfaces – Wet floors or broken walkways increase fall hazards.

Poor Ventilation – Lack of airflow can expose workers to dust, fumes, or harmful gases.

Improper Storage of Materials – Unstable stacking or incorrect storage may cause falling objects.

Excessive Noise or Heat – High noise or temperature levels can cause stress, fatigue, or long-term health issues.



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Early Warning Signs – Near Misses

- Unusual Equipment Behaviour – Abnormal noise, vibration, overheating, or leaks indicate potential failure.
- Repeated Minor Injuries – Small cuts, strains, or irritation suggest an underlying hazard.
- Near Miss Events – Situations where an accident almost happened but no injury occurred.
- Frequent Complaints from Workers – Reports of discomfort, fatigue, or unsafe conditions signal risk.
- Damage to Tools or Property – Bent tools, broken guards, or damaged structures show unsafe conditions.
- Changes in Work Conditions – New tasks, materials, weather, or staffing can introduce new hazards.
- Complaints by Workers – Workers complaining of unsafe working conditions



Task Based Hazard Identification - JSA

1. What is JSA:

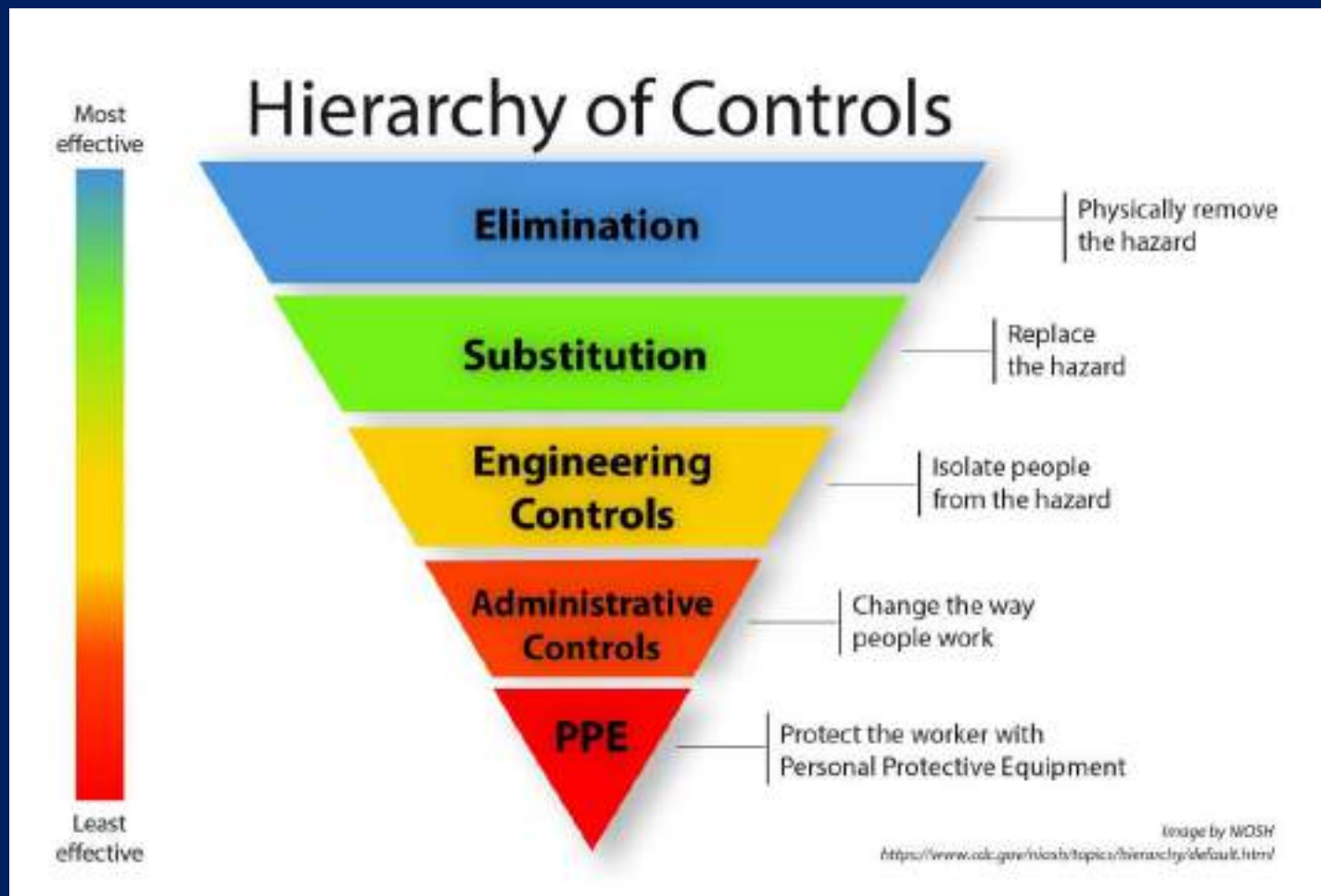
- Job Safety Analysis (JSA) is a systematic OHS tool used to identify hazards associated with a specific job or task. It involves breaking the job into steps, identifying hazards at each step, and determining control measures to eliminate or reduce risks before work begins.

2. When to Use JSA:

- Before starting a new or unfamiliar task
- When introducing new equipment, materials, or procedures
- For high-risk or non-routine jobs
- After an accident, incident, or near miss
- When work conditions or environment change
- When workers are unsure about task safety



Control Measures



Control Gaps

Control gaps in OHS refer to weaknesses or missing safety measures that fail to adequately control workplace hazards. They occur when existing controls are insufficient, not followed, outdated, or absent.

Example

- A machine may have a safety guard, but if it is broken or removed, a control gap exists.
- Providing personal protective equipment without proper training or supervision.

Control gaps can also arise when work conditions change, such as new equipment being introduced without updating procedures.



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Risk Assessment

OHS risk assessment is a systematic process used to identify workplace hazards, evaluate the level of risk associated with them, and determine appropriate control measures to prevent injury or illness. The process begins with hazard identification, where potential sources of harm such as unsafe equipment, hazardous substances, poor work practices, or environmental conditions are recognized. Once hazards are identified, the likelihood of an incident occurring and the severity of possible consequences are assessed to determine the level of risk. Based on this evaluation, control measures are selected using the hierarchy of controls, which includes elimination, substitution, engineering controls, administrative controls, and personal protective equipment. Risk assessments should be conducted before starting new tasks, when changes occur in the workplace, after incidents or near misses, and at regular intervals. Worker consultation is essential, as employees often have practical knowledge of hazards. Effective OHS risk assessment helps reduce accidents, ensures legal compliance, promotes a safer work environment, and supports continuous improvement in workplace health and safety performance.



Generic Risk Assessment

A generic risk assessment identifies potential workplace hazards, evaluates the risks, and implements control measures to ensure employee safety. Common hazards include slips, trips, falls, manual handling injuries, electrical hazards, chemical exposure, and machinery accidents. Each risk is assessed based on likelihood and severity, and preventive measures are applied, such as proper training, use of personal protective equipment (PPE), safe work procedures, regular equipment maintenance, and emergency preparedness. Continuous monitoring, reporting, and review ensure effectiveness. The goal is to minimize harm, comply with OHS regulations, and foster a safe, healthy working environment for all personnel.



Severity	Disaster	High	Medium	Minimal
Probability	Critical	Critical	High	Medium
Regularly	Critical	High	Medium	Low
Probable	Critical	High	Medium	Low
Occasional	Critical	High	Medium	Low
Rarely	High	Medium	Medium	Low
Unlikely	Medium	Medium	Low	Low

Task Specific Risk Assessment

A Task-Specific Risk Assessment (TSRA) in Occupational Health and Safety (OHS) is a systematic process of identifying hazards, evaluating risks, and implementing control measures for a particular task or activity. It focuses on the specific conditions, equipment, and environment associated with that task to prevent accidents, injuries, or health issues.



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Regularly	Critical	Critical	High	Medium
Probable	Critical	High	Medium	Low
Occasional	Critical	High	Medium	Low
Rarely	High	Medium	Medium	Low
Unlikely	Medium	Medium	Low	Low

Generic vs Task Specific Risk Assessment

Aspect	Generic Risk Assessment	Task-Specific Risk Assessment (TSRA)
Definition	A broad assessment covering general workplace hazards across multiple tasks or areas.	A focused assessment for a particular task, activity, or process.
Scope	Wide; applies to general operations and routine activities.	Narrow; applies only to a specific task or operation.
Detail	Less detailed, identifies common risks.	Highly detailed, considers task-specific hazards.
Purpose	Provides overall safety guidelines and compliance framework.	Prevents incidents during a specific task by controlling unique risks.
Examples	Slips, trips, falls in the workplace; general fire hazards.	Operating a forklift, using a circular saw, handling chemicals.

Severity	Disaster	High	Medium	Minimal
Probability				
Regularly	Critical	Critical	High	Medium
Probable	Critical	High	Medium	Low
Occasional	Critical	High	Medium	Low
Rarely	High	Medium	Medium	Low
Probable	Medium	Medium	Low	Low

Ergonomic (DSE) Risk Assessment

A Display Screen Equipment (DSE) Ergonomic Assessment is the systematic evaluation of a workstation and work practices to ensure safe and comfortable use of computers, laptops, and other display screen equipment. It identifies risks related to posture, seating, keyboard and mouse placement, screen height, lighting, and breaks. The goal is to prevent musculoskeletal disorders, eye strain, fatigue, and other health issues, promoting employee well-being and compliance with occupational health and safety regulations.



Noise Risk Assessment

A Noise Assessment in Occupational Health and Safety (OHS) is the systematic process of measuring and evaluating sound levels in the workplace to identify potential risks to hearing and overall health. It involves monitoring noise intensity, frequency, and duration, and comparing results against legal exposure limits. Based on the findings, control measures—such as engineering controls, administrative controls, personal protective equipment (earplugs or earmuffs), and training—are implemented to prevent hearing loss, tinnitus, and other noise-related health issues, ensuring a safer and compliant working environment.

A **noise level meter** is a device used to measure sound intensity in decibels (dB). It helps assess workplace noise, identify hazards, and ensure compliance with occupational health and safety standards.



Manual Handling Assessment

A Manual Handling Risk Assessment is a systematic process used in Occupational Health and Safety to identify, evaluate, and control risks associated with lifting, carrying, pushing, pulling, or moving objects manually. It assesses factors such as load weight, frequency, posture, and environment to prevent musculoskeletal injuries, strains, sprains, and other health issues. The assessment helps implement safe work practices, use of mechanical aids, and employee training to minimise harm.

Project/Facility:		
Contact No:		
Scope:	Various Work Tasks including site set up, soft strip, and Demolition	
Assessed by:	Reference No:	
Assessment Date:	Next Assessment Date:	
Project Engineer:	Site Supervisor:	

PART 1- ASSESSMENT (Answer the following questions)		Yes	No
1.	Does the operation involve a significant risk of injury? (complete Section B)		
2.	If No the assessment need go no further.		
3.	If Yes, can the operation be avoided, mechanized or level of risk reduced?		
4.	If Yes, record steps in Sect. C & D and review		
5.	Has the risk of injury been eliminated or reduced to an acceptable level?		
6.	If Yes, the assessment is complete. If No, review activities to eliminate significant risks relating to Manual Handling Operations.		



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





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