EMERGENCY CRISIS DISASTER SAFETY ENVIRONMENTAL & RISK MANAGEMENT INSTITUTE

# RISK ASSESSMENT & SAFETY MANAGEMENT COURSE

Presenter: Engr Prof Akaninyene Ekong FECRMI, FNISafetyE
aekong007@gmail.com

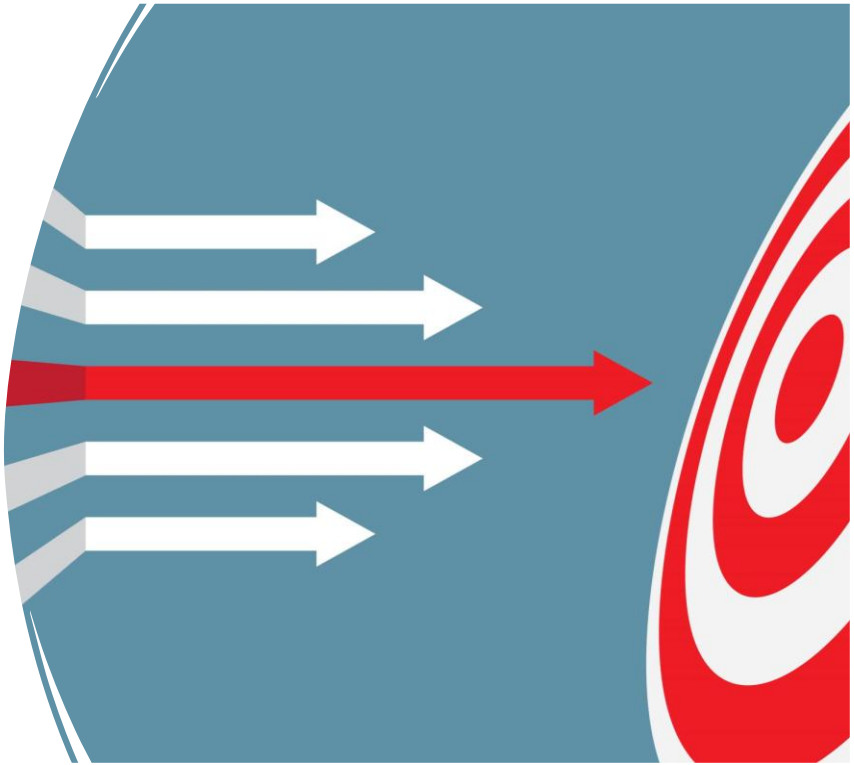
# OUTLINE

- Definition of terms
- Hazard Identification, Legal requirements & Compliance
- Risk methodologies & developing control measures
- Safety management systems and strategy monitoring

# AIMS & OBJECTIVES

Participants will understand risk assessment and safety management techniques.

Learn to identify, evaluate and control workplace hazards professionally



# Definition of terms

## ❑ Hazard

A potential source of harm or adverse effect on people, property, or the environment.

- ❑ Examples: exposed electrical wires, toxic chemicals, slippery floors.

A hazard exists even if no one is harmed yet.

# Definition of terms contd.

## ❑ Safety

The condition of being protected or free from harm, injury, or danger. In occupational health, it means minimizing exposure to hazards and controlling risks.

## ❑ Health

- The absence of disease or illness both mental and physical.

# Definition of terms contd..

- **Environment**

The surroundings in which we live including air, water, land, natural resources, flora, fauna, humans and their interrelationships.

- **Exposure** :

The measurement of time during which the subject is at risk from a hazard.

# Definition of terms contd..

## ❑ Risk

The probability that a hazard will actually cause harm, combined with the severity of that harm.

Formula often used

- Risk = Likelihood of harm x Severity of harm

Example: A wet floor is a hazard. The risk depends on how many people walk there and how severe an injury could be if they slip

# COMPARISON

| Term | Meaning | Example | Keypoint |
|---|---|---|---|
| Safety | Condition of being free from harm | Wearing PPE in a factory | Goal is prevention |
| Hazard | Potential source of harm | Exposed live wire | Exists regardless of exposure |
| Risk | Likelihood x Severity of harm | Potential or chance of electrocution from touching wire | Depends on exposure & controls |

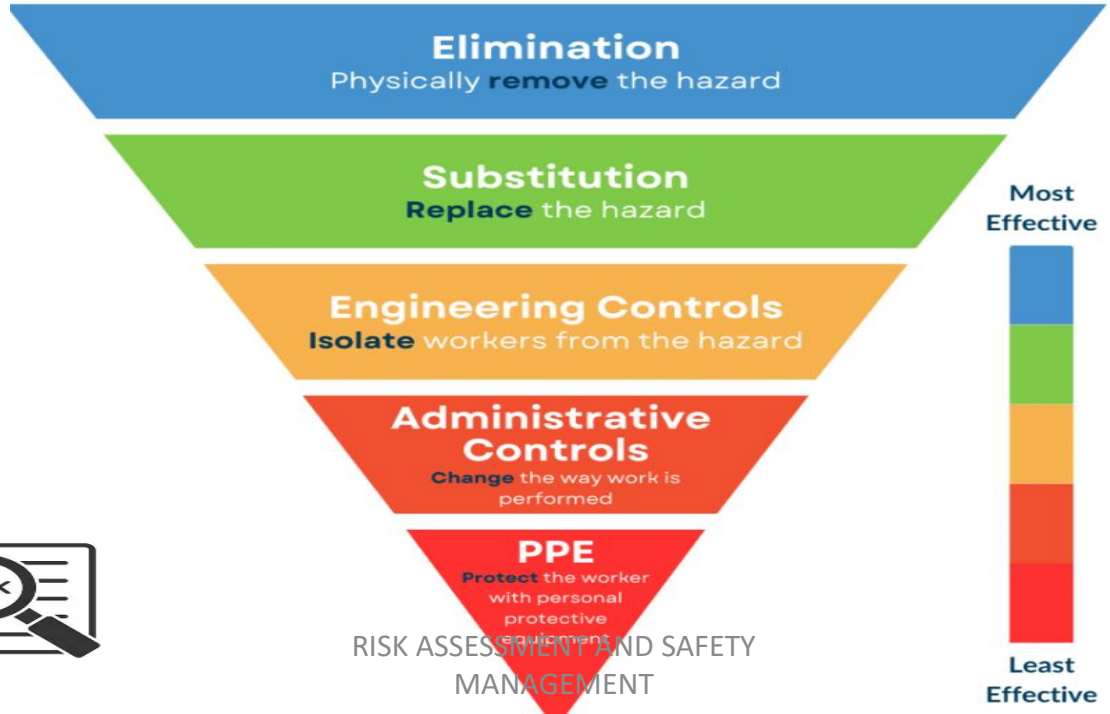
# Hazard Identification

Hazard identification is the process of recognizing conditions or activities that can cause harm.

Common Techniques:

- ❑ Workplace inspections
- ❑ Job Safety Analysis (JSA)
- ❑ Hazard and Operability Study (HAZOP)
- ❑ Incident history review

# HIERARCHY OF CONTROLS



# Steps in Hazard Identification

**1. Preparation & Planning**

- ✓ Define the scope: which areas, tasks, or processes will be assessed.
- ✓ Gather relevant documents: policies, incident reports, equipment manuals.
- ✓ Involve workers: they often know the hidden hazards.

# Steps in Hazard Identification contd.

## 2. Workplace Inspection

- ✓ Physically walk through the workplace.
- ✓ Observe tasks, equipment, materials, and environment.
- ✓ Look for unsafe conditions (e.g., spills, faulty wiring, poor ventilation).

# Steps in Hazard Identification contd

**3. Task Analysis**

- ✓ Break down each job into steps.
- ✓ Identify hazards at each stage (e.g., lifting, cutting, welding).
- ✓ Consider routine and non-routine tasks.

# Steps in Hazard Identification contd

## 4. Consultation & Feedback

- ✓ Talk to employees, supervisors, and safety representatives.
- ✓ Review past incidents, near misses, and complaints.
- ✓ Use surveys or interviews to capture overlooked hazards.

# Steps in Hazard Identification contd

**5. Review of Records & Data**

- ✓ Analyze accident/incident reports, medical records, and maintenance logs.
- ✓ Check regulatory requirements and industry standards.
- ✓ Identify recurring issues.

# Steps in Hazard Identification contd

## 6. Hazard Categorization

- ✓ Classify hazards into types: physical, chemical, biological, ergonomic, psychosocial.
- ✓ This helps in prioritizing and applying appropriate controls.

# Steps in Hazard Identification contd

**7. Risk Assessment**

- ✓ For each hazard, evaluate likelihood and severity.
- ✓ Use a risk matrix to rank hazards (low, medium, high).
- ✓ Focus first on high-risk hazards

# Steps in Hazard Identification contd

## 8. Documentation

- ✓ Record identified hazards, risk ratings, and recommended controls.
- ✓ Keep clear records for accountability and future reviews.

# Steps in Hazard Identification contd

## 9. Implementation of Controls

- ✓ Apply the hierarchy of controls: Elimination → Substitution → Engineering → Administrative → PPE.
- ✓ Ensure controls are practical and effective.

# Steps in Hazard Identification contd

**10. Monitoring & Review**

- ✓ Regularly re-check the workplace.
- ✓ Update hazard lists when processes, equipment, or staff change.
- ✓ Continuous improvement ensures hazards don’t reappear.

# Simplified Flow

- Plan → Inspect → Analyze Tasks → Consult → Review Records → Categorize Hazards → Assess Risks → Document → Control → Monitor

# Understanding Risk Assessment and its Importance

Risk assessment is the process of identifying potential hazards and analyzing what could happen if a hazard occurs

Importance of Risk Assessment

- ❑ Protects employees and stakeholders
- ❑ Prevents accidents and financial losses
- ❑ Enhances decision-making and safety culture

# Reasons for good management of Health and Safety

- **Moral**: Ethical and responsible behavior
- **Financial/Economic**: The cost of injuries and ill health
- **Legal**: Criminal and Civil liability

# Legal Requirements & Compliance

# International Labour Organization

The International Labour Organization (ILO) is a UN agency active in setting health and safety standards based on adopted principles.

- **C155, The Occupational Health and Safety Convention, 1981, ILO.**
  It is a goal setting policy for establishments/companies and nations.

- **P155, The Protocol to the Occupational Health and Safety Convention, 1981, ILO.**
  This expands on some provisions for reporting of occupational accidents to national authorities.

- **The Occupational Health and Safety Recommendations (R164), 1981.**
  This supplements C155 and gives more detailed guidance on how to comply with its policies.

# International Labour Organization

Article **10** of the Convention **(C155 1981)** states basic obligations for the employer:

- To provide and maintain workplaces, machinery, equipment and work processes.

- To ensure that Chemical, Physical and Biological substances
  and agents are without risk to health when protective measures have been taken.

- Provide adequate protective clothing and equipment to prevent risks of accidents or adverse health effects.

# ILO Regulations

This is expanded in Article **10** of **R164**:

- ✓ To **provide and maintain** workplaces, machinery and equipment and use working methods which are safe.
- ✓ Give necessary **instruction, training and supervision** in application and use of safety and health measures.
- ✓ Provide PPE and clothing **without charge** to the worker.
- ✓ Ensure that work **organization**, particularly **working hours** and **rest breaks** does not adversely affect occupational safety and health.
- ✓ Take reasonably practical measures with a view to **eliminating** excessive **physical and mental fatigue.**
- ✓ To **keep abreast** of **scientific and technical knowledge** to comply with all the previous points

# Legal Requirement

- Risk assessment is legally required in Nigeria's construction industry under the Factories Act and Occupational Safety and Health regulations, NISafetyE Approved Code of Practice for Construction Safety, COREN Regulation of Construction Industry etc.
- It helps prevent accidents like falls, electrocution, and trench collapses, and ensures compliance with safety laws. Practical examples include PPE use, scaffolding checks, and hazard signage.

# Compliance

Criminal offence - this is due to breach of legislation and results in:

- The company being fined.
- Individuals possibly being fined or imprisoned.

Civil liability may also arise

•Compensation for injuries may be due in cases of negligence

# Summary

DEFINITION OF TERMS AND HAZARD IDENTIFICATION

IMPORTANCE OF RISK ASSESSMENT

LEGAL REQUIREMENTS-ILO

COMPLIANCE

# RISK METHODOLOGIES
# &
# DEVELOPING CONTROL MEASURES

# ISO 31000 Overview

The international standard that provides guidelines for risk management principles and implementation is ISO 31000.

The most current version is ISO 31000:2018, which was last reviewed and confirmed in 2023.

Full Name: ISO 31000:2018 Risk Management Guidelines

Publisher: International Organization for Standardization (ISO)

Scope: Provides principles, framework, and a process for managing risk.

Applicability: All organizations, regardless of size, industry, or sector.

# Risk Methodologies in Health and Safety

In health and safety, risk methodologies are structured approaches used to identify hazards, assess their likelihood and severity, and implement controls to minimize harm.

The most common methods include qualitative, quantitative, and hybrid risk assessments, each tailored to workplace context and regulatory requirements.

# Core Risk Assessment Methodologies

## 1. Qualitative Risk Assessment

- Approach: Uses descriptive scales (e.g., low/medium/high) to evaluate risks.
- Strengths: Simple, fast, widely applicable.
- Limitations: Subjective; less precise for complex hazards.
- Best for: Small businesses, general workplace safety, initial screenings.

# Core Risk Assessment Methodologies

## 2. Quantitative Risk Assessment

- Approach: Applies numerical values, probabilities, and statistical models.
- Strengths: Provides measurable, data-driven results.
- Limitations: Requires detailed data and expertise.
- Best for: High-risk industries (oil & gas, aviation, nuclear). Eg Fault Tree Analysis.

# Core Risk Assessment Methodologies

**3. Semi-Quantitative (Hybrid) Methods**

- Approach: Combines scoring systems with qualitative judgments.
- Strengths: Balances simplicity with more structured analysis.
- Best for: Medium-to-large organizations needing scalable solutions. Eg Risk Matrix scoring system.

# Risk Assessment Techniques

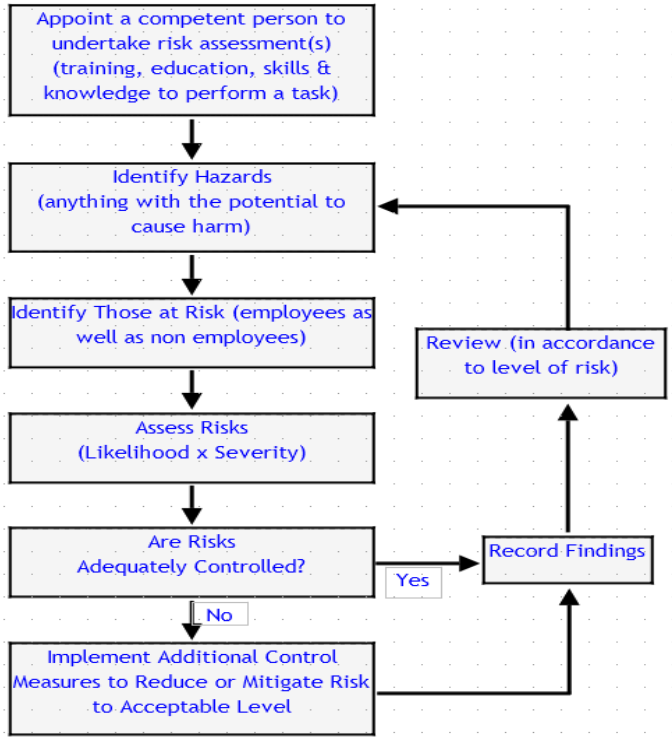
| Methodology | Description | Application |
|---|---|---|
| Job Safety Analysis (JSA) | Breaks tasks into steps, identifies hazards at each stage | Manufacturing, Construction, Oil & Gas etc |
| Hazard and Operability Study (HAZOP) | Systematic review of processes to detect deviations | Chemical, process industries |
| Failure Modes and Effects Analysis (FMEA) | Evaluates potential failures and their impacts | Engineering, product design |
| Bow-Tie Analysis | Visual method linking causes, hazards, and controls | Complex systems with multiple risk pathways |
| Dynamic Risk Assessment | Real-time evaluation during changing conditions | Emergency response, healthcare |

# Risk Assessments

- Risk assessments identify what might go wrong and how, with an evaluation of any identified hazards undertaken, this to determine the control measures needed to prevent or minimize the risk.

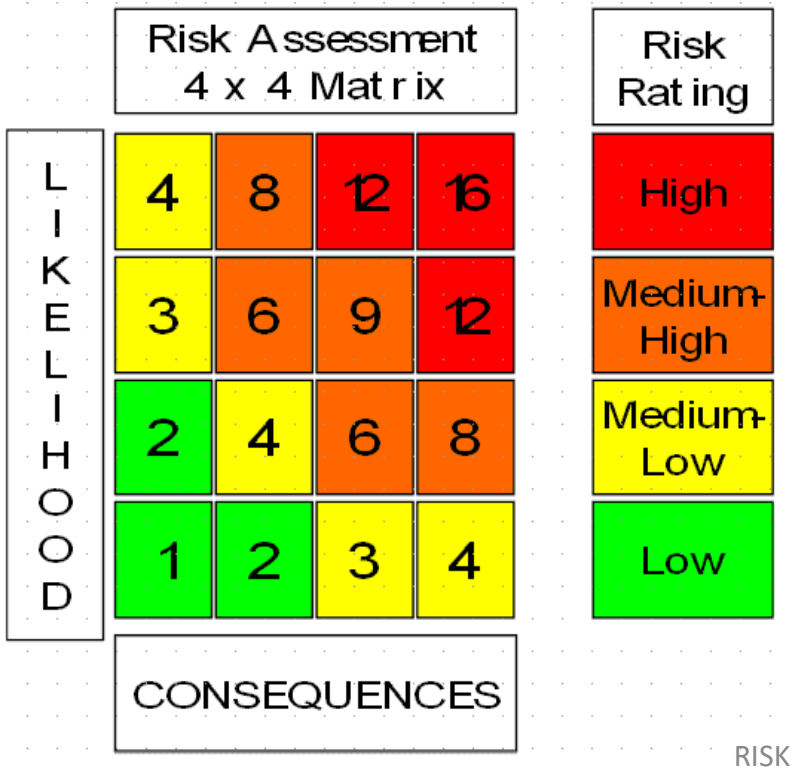
- Workers and others have a right to be protected from harm caused by a failure of the business or controlling entity to take reasonable measures to eliminate or reduce risks to acceptable levels.

# 5 Steps in Risk Assessment




Step 1 - Identify the activity and hazards
Step 2 - Decide who might be harmed and how
Step 3 -Evaluate the risks and determine the controls required
Step 4 -Record the findings and implement
Step 5 - Review and revise

# Risk Assessment Matrix- 4x4




**Likelihood (Probability)**

4. Likely or frequent (likely to occur, to be expected)
3. Probable (not surprised, will occur in given time)
2. Possible (could occur occasional)
1. Extremely Remote (unlikely, though possible)

**Severity (Impact)**

4. Fatality, Major Injury (imminent danger exists, hazard capable of causing multiple deaths and illness
3. Serious Injury (hazard can result in serious injury and/or illness, asset damage)
2. Minor Injury (hazard can cause illness, injury or asset damage but the results would not be expected to be serious)
1. Trivial or Negligible (hazard will not result in serious injury or illness, remote possibility of damage)

# The 4x4 Risk Assessment Matrix

The red, amber, yellow and green colours reflect varying levels of overall risk with green and yellow being generally accoloursceptable (normally subject to monitoring), amber being for caution and concern and red being of significant concern.

Risk Rating is calculated by multiplying the likelihood against the consequences, e.g. taking a likelihood of 3 which is classified as Probable (do not be surprised, it will occur in given time), and multiplying this against a consequence of 2 which is classified as a Minor Injury (hazard can cause illness, injury or equipment damage but the results would not be expected to be serious), would give you and overall risk rating of 6, which is the first risk rating to be classified as a medium-high.

Multiplying the Likelihood by the Consequences allows an easy identification of the risk rating.

If the Risk Rating is between

- Score 3 or 4 - Medium Low, Requires attention to reduce the rating and regular ongoing monitoring
- Score 6, 8 or 9 - Medium High, Requires immediate attention to bring the risk down to an acceptable level
- Score 12 or 16 - High, Stop immediately? Risk is too high and not acceptable

# FMEA (Failure Modes and Effects Analysis)- Example

**Scenario: A hospital uses infusion pumps to deliver medication to patients.**

1. Function: Deliver medication at a controlled rate.
2. Potential Failure Mode: Pump delivers incorrect dosage.
3. Effect of Failure: Patient receives overdose or underdose → health risk.
4. Cause of Failure: Software glitch, calibration error, user misprogramming.
5. Severity (S): 9 (life-threatening).
6. Occurrence (O): 4 (moderately likely).
7. Detection (D): 3 (likely detected by alarms).
8. Risk Priority Number (RPN): 9x4x3=108

**Action**

- Introduce double-check protocols.
- Improve alarm systems.
- Regular calibration and software updates.

This structured scoring helps prioritize which risks need urgent mitigation

# Bow Tie - Example

Vendor exposes private customer data (confidential information such as names, addresses, financial details, or health records).

**Threats (Causes leading to the event)**

Vendor lacks strong access controls (weak authentication, shared accounts).

Misconfigured cloud storage (open S3 bucket, public database).

Insider negligence (employee accidentally shares files).

Third-party software vulnerability exploited.

Inadequate vendor security policies or training.

Phishing attack targeting vendor staff.

# Bow tie parameter- Preventive Barrier example

**Preventive Barriers (Controls to stop threats)**

Vendor risk assessments and due diligence before onboarding.

Strong contractual obligations (data protection clauses, audits).

Multi-factor authentication and role-based access control.

Regular vendor security audits and penetration testing.

Secure configuration management (cloud storage, databases).

Employee awareness and training programs.

Continuous monitoring for suspicious access

# Bow tie parameter- Consequence example

**Consequences (Impacts after the event)**

Loss of customer trust and reputational damage.

Regulatory fines

Legal liability and lawsuits.

Financial losses from remediation and compensation.

Identity theft or fraud affecting customers.

Business disruption and loss of competitive advantage.

# Bow tie parameter- Mitigating barriers example

**Mitigating Barriers (Controls to reduce impact)**

Incident response plan with vendor coordination.

Rapid breach notification procedures.

Data encryption (at rest and in transit).

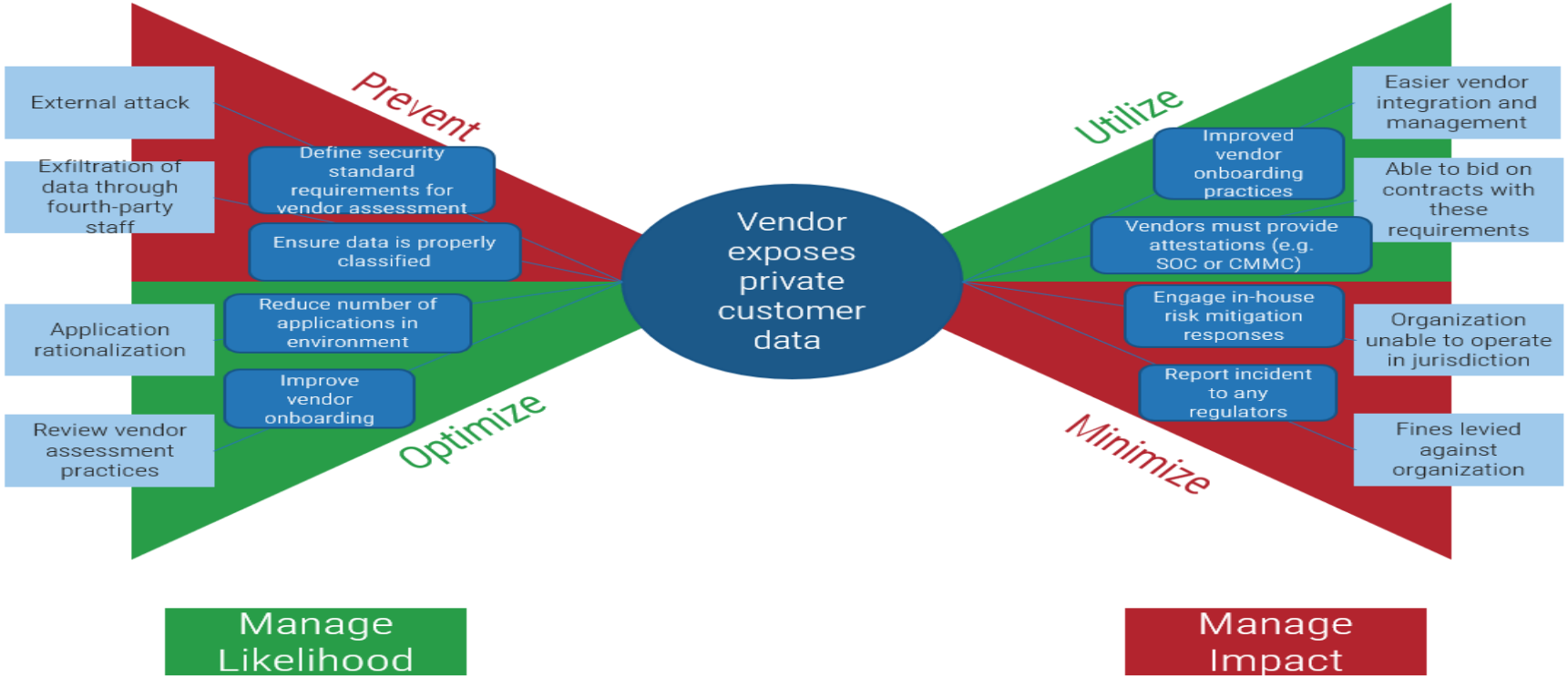
Cyber insurance coverage.

Customer support and remediation (credit monitoring, fraud alerts).

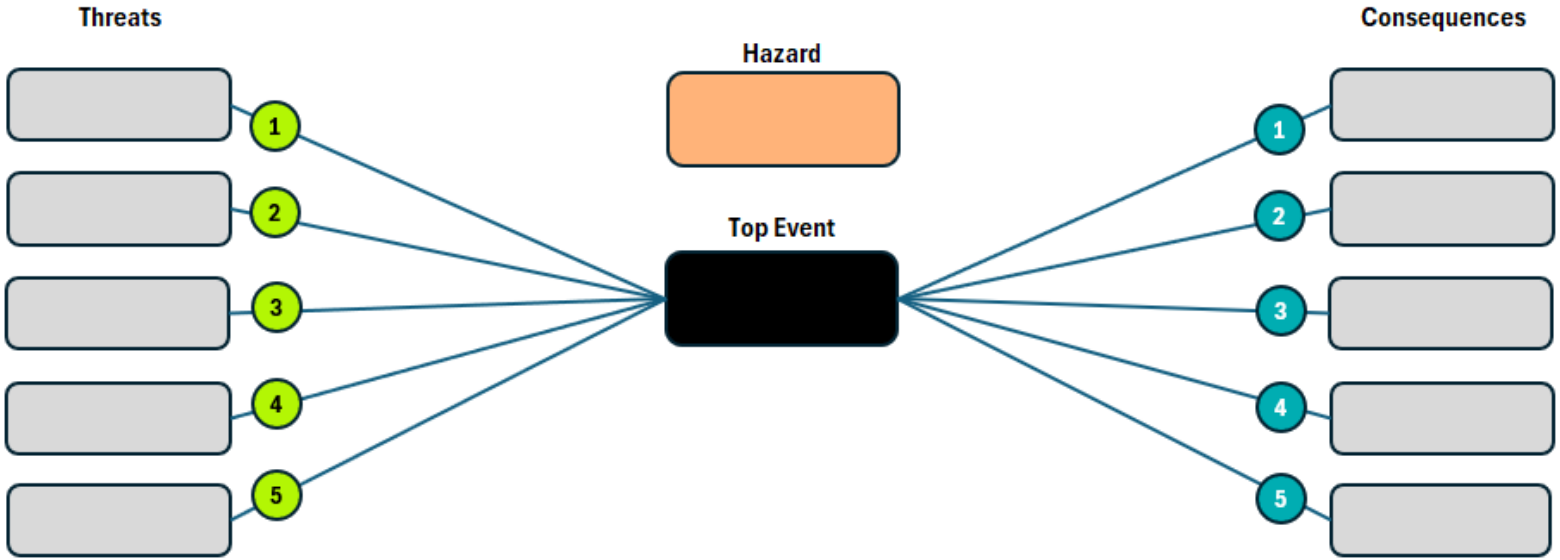
Regulatory compliance reporting.

Post-incident vendor review and contract renegotiation.

# Bow Tie


External attack
Exfiltration of data through fourth-party staff
Application rationalization
Review vendor assessment practices
Prevent
Define security standard requirements for vendor assessment
Ensure data is properly classified
Reduce number of applications in environment
Improve vendor onboarding
Optimize
Vendor exposes private customer data
Utilize
Improved vendor onboarding practices
Vendors must provide attestations (e.g. SOC or CMMC)
Engage in-house risk mitigation responses
Report incident to any regulators
Minimize
Easier vendor integration and management
Able to bid on contracts with these requirements
Organization unable to operate in jurisdiction
Fines levied against organization
Manage Likelihood
Manage Impact

# Bow Tie



# Hazard Identification (HAZID)

# Risk and Control measures in various industries

## Common Hazards in Oil & Gas

**1. Gas Leak Detection**

Hazard: Flammable gas release

Risk: Explosion, fire

Control: Fixed and portable gas detectors, alarm systems

**2. Offshore Rig Safety**

Hazard: Fall from height or drowning

Risk: Fatality

Control: Harnesses, lifeboats, emergency drills

**3. Pipeline Operations**

Hazard: Corrosion or sabotage

Risk: Oil spill, environmental damage

Control: Regular inspections, surveillance, cathodic protection

# Hazards in Construction

**1. Working at Heights**

Hazard: Fall from scaffolding

Risk: Severe injury or death

Control: Guardrails, harnesses, training

**2. Excavation and Trenching**

Hazard: Collapse or suffocation

Risk: Fatality or serious injury

Control: Shoring, trench boxes, inspections

**3. Electrical Hazards**

Hazard: Live wires or faulty equipment

Risk: Electrocution

**Control: Lockout/tagout procedures, insulated tools**

**4. Manual Handling**

Hazard: Lifting heavy materials

Risk: Back injuries

Control: Mechanical aids, proper lifting techniques

# How to Conduct a Risk Assessment

1. Identify Hazards – Walkthroughs, checklists, worker input
2. Determine Who Might Be Harmed – Workers, visitors, subcontractors
3. Evaluate Risks – Use a 3×3 4x4 or 5×5 risk matrix
4. Implement Controls – Follow Hierarchy of controls
5. Record and Review – Keep logs, update after incidents

# Summary

- ISO 31000 Risk Management Guideline
- Core Risk Assessment Methodologies
- Risk Assessment Matrix
- Job Safety Analysis
- Failure Mode Effect Analysis
- Hazard and Operability
- Bow Tie
- Risk and Control measures in various industries.

# Safety Management Systems

# &

# Strategy Monitoring

**Building Safer Workplaces Through Proactive Oversight**

# What is a Safety Management System (SMS)

A Safety Management System (SMS) is a structured framework that organizations use to proactively identify, assess, and control risks to ensure workplace safety, regulatory compliance, and continuous improvement. It integrates policies, procedures, and practices to build a strong safety culture across all levels of an organization.

**Core Principles of SMS**

- ✓ Proactive risk management
- ✓ Continuous improvement
- ✓ Employee involvement
- ✓ Leadership accountability

# Types of Safety Management Systems

- Aviation Safety Management System (FAA/ICAO)
- Occupational Health and Safety Management System (OHSMS)
- Environmental Safety Management System (EMS
- Process Safety Management System (PSMS)
- Integrated Safety Management System (ISMS)

# Aviation Safety Management System (FAA/ICAO)

Purpose: Ensures safe flight operations and compliance with aviation regulations.

Key Features:

- ✓ Hazard reporting systems for pilots and crew
- ✓ Risk-based decision-making for airlines and airports
- ✓ Compliance with ICAO Annex 19 and FAA Title 14 CFR

# Occupational Health and Safety Management System (OHSMS)

Purpose: Protects workers from workplace hazards across industries.

Frameworks: ISO 45001 – International standard for occupational safety

Key Features:

✓ Hazard identification and risk assessment

✓ Training and competency development

✓ Incident reporting and corrective actions

# Environmental (Safety) Management System (EMS

Purpose: Focuses on environmental protection and sustainability.

Frameworks: ISO 14001 – Environmental management standard

Key Features:

✓ Pollution prevention and waste management

✓ Compliance with environmental laws

✓ Monitoring environmental performance

# Process Safety Management System (PSMS)

Purpose: Used in industries with hazardous chemicals (oil, gas, chemical plants).

Frameworks: OSHA 29 CFR 1910.119 – Process Safety Management standard

Key Features:

- ✓ Prevents catastrophic releases of toxic, reactive, or flammable substances
- ✓ Mechanical integrity programs
- ✓ Emergency response planning

# Integrated Safety Management System (ISMS)

Purpose: Combines occupational, environmental, and process safety into one system.

Key Features:

- ✓ Wholistic risk management across all operations
- ✓ Streamlined compliance with multiple standards
- ✓ Continuous improvement culture

# Key features of SMS

- Safety policy
- Risk management
- Safety assurance
- Safety promotion

# Safety Policy

- Defines the organization’s commitment to safety.
- Establishes clear objectives and responsibilities.
- Ensures leadership accountability and employee involvement.

# Risk management

- Hazard identification and risk assessment.
- Implementation of controls using the hierarchy of controls (elimination, substitution, engineering, administrative, PPE).
- Emergency preparedness and response planning.

# Safety Assurance

- Continuous monitoring of safety performance.
- Incident reporting and investigation.
- Audits, inspections, and corrective actions.

# Safety Promotion

- Training and competency development.
- Communication of safety policies and procedures.
- Encouraging employee participation and feedback.

# Practical Steps for SMS Implementation

- ✓ Step 1: Establish leadership commitment and allocate resources.
- ✓ Step 2: Conduct baseline risk assessments and set measurable safety goals.
- ✓ Step 3: Develop policies, procedures, and training programs.
- ✓ Step 4: Implement monitoring systems (audits, KPIs, incident tracking).
- ✓ Step 5: Review and continuously improve through feedback loops.

# Challenges & Risks

- Resistance to change: Employees may see SMS as extra work.
- Insufficient training: Without proper education, policies remain ineffective.
- Poor communication: Safety messages must be clear and consistent.
- Complacency: Continuous reinforcement is needed to prevent lapses.

# Key Point

- A Safety Management System is not just a compliance tool rather it is a strategic investment in organizational resilience and employee well-being.
- By embedding safety into everyday operations, companies can reduce risks, improve efficiency, and foster a culture where safety is a shared responsibility

# Safety strategy monitoring

Safety strategy monitoring is the systematic process of tracking safety initiatives to ensure they are effective.

- Purpose: To verify that safety policies, programs, and controls achieve desired outcomes.

# Objectives of Monitoring

- Ensure compliance with regulations and standards.
- Measure effectiveness of safety strategies.
- Identify gaps and areas for improvement.
- Support decision-making with reliable data.

# Key Elements of Safety Strategy Monitoring

- Key Performance Indicators (KPIs): Accident rates, near-miss reports, training completion.
- Audits & Inspections: Regular checks to verify compliance.
- Incident Reporting Systems: Transparent reporting and root cause analysis.
- Feedback Mechanisms: Employee input and safety culture surveys.

# Key Performance Indicators

- ✓ HSE KPIs help organizations monitor incidents, near misses, unsafe acts, and unsafe conditions.
- ✓ Enables early identification of hazards
- ✓ Reduces accidents, injuries, and fatalities
- ✓ Promotes proactive safety management

# Why have KPI ?

**Supports Regulatory Compliance**

Many industries must comply with regulations from authorities such as: Government safety regulators and Environmental agencies.

International standards (e.g., ISO 45001 Occupational Health and Safety Management Systems)

- ❑ Benefit- Demonstrates compliance with legal requirements and avoids penalties, shutdowns, or litigation

# Why have KPI ?

**Improves Decision Making**

Management uses HSE KPI data to make informed decisions regarding operations, equipment, and workforce safety.

- Benefit: Data-driven decisions , better allocation of safety resources and early identification of high-risk areas

# Why have KPI ?

**Enhances Operational Efficiency**

Accidents disrupt operations through downtime, equipment damage, and investigations.

- Benefit: Reduced operational interruptions, Improved productivity, Smooth project delivery

A safer workplace typically results in higher workforce efficiency

# Why have KPI ?

**Reduces Financial Losses**

Workplace incidents create significant costs including:

- ❖ Medical expenses
- ❖ Insurance claims
- ❖ Equipment repairs
- ❖ Compensation payments
- ❖ Production delays
- ❑ Benefit: Effective HSE KPIs help prevent incidents, thereby saving significant operational costs.

# HSE KPI Summary

HSE KPIs help companies to achieve the following;

- ✓ Prevent accidents
- ✓ Reduce costs
- ✓ Improve productivity
- ✓ Ensure legal compliance
- ✓ Strengthen reputation
- ✓ Attract investors
- ✓ Promote continuous safety improvement

# HSE STATISTICS

TECHNOFIT

## HSE STATISTICS BOARD

| DESCRIPTION | LAST MONTH | CUMULATI |
|---|---|---|
| MAN HOURS WORK | 58,990 | 10,018,19 |
| NO OF WORKFORCE | 656 | N/A |
| NEAR MISSES | 0 | 30 |
| FIRST AID CASE | 0 | 1 |
| PROPERTY DAMAGE | 0 | 0 |
| HSE VIOLATION | 0 | 1 |
| MINOR FIRE | 0 | 0 |
| MATERIAL FROM HEIGHT | 0 | 0 |
| LOST TIME INJURY | 0 | 0 |
| RESTRICTED WORKDAYS CASSES | 0 | 20 |
| TOTAL INCIDENT CASE | 0 | 52 |
| INCIDENT RATE | 0 | 13.36 |
| FREQ RATE | 0 | 4.09 |
| TRIR | 0 | 0.8 |

# Tools & Techniques

Digital dashboards for real-time monitoring.

Risk assessment matrices.

Benchmarking against industry standards.

Predictive analytics for proactive risk management.

# Leading Indicators

**Leading Indicators (Proactive Indicators)**

Leading indicators are proactive and preventive measures that track activities intended to prevent accidents before they occur.

They measure safety efforts and behaviors rather than incidents.

They predict and prevent accidents.

# Examples of Leading Indicators

- ✓ Safety Training Hours
- ✓ Number of hours workers receive safety training
- ✓ Safety Audits / Inspections
- ✓ Regular checks of workplace safety conditions
- ✓ Near Miss Reporting
- ✓ Reporting incidents that almost caused harm
- ✓ Toolbox Meetings
- ✓ Short safety briefings before work
- ✓ Safety Observations
- ✓ Monitoring unsafe acts and conditions
- ✓ Permit to Work Compliance
- ✓ Monitoring proper use of work permits

# Lagging Indicators

**Lagging Indicators (Reactive Indicators)**

Lagging indicators measure events that have already happened, such as accidents, injuries, or property damage.

They show the outcome of safety performance.

They tell us what went wrong after an incident.

# Examples of Lagging Indicators

- Lost Time Injury (LTI)
- Injuries causing workers to miss work
- Deaths from workplace accidents
- Total number of recordable incidents
- Property Damage Incidents
- Damage to equipment or facilities
- Oil or chemical spills
- Number of workdays lost due to injury

# Monitoring Cycle- PDCA

1. Plan: Define safety goals and KPIs.
2. Do: Implement safety strategies.
3. Check: Monitor performance through audits, reports, and data analysis.
4. Act: Adjust strategies based on findings (continuous improvement)

# Benefits of Effective Monitoring

- Reduced accidents and incidents.
- Improved compliance with OSHA, ISO 45001, FA and industry standards.
- Enhanced employee trust and engagement.
- Cost savings through prevention rather than reaction.

# Challenges in Monitoring

- Data overload without clear analysis
- Inconsistent reporting practices.
- Resistance to transparency.
- Lack of leadership commitment.

# Summary

- Safety Management Systems, principles , features and types
- Safety monitoring strategies
- Key performance indicators
- Leading and Lagging Indicators
- PDCA Cycle
- Benefits of Effective monitoring and challenges

THANK YOU FOR YOUR ATTENTION

ANY QUESTIONS?