UTM OPENCOURSEWARE

CONSTRUCTION SAFETY: 5

HAZARD IDENTIFICATION, RISK ASSESSMENT & RISK CONTROL (HIRARC)

SBC 3363

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HAZARD IDENTIFICATION, RISK ASSESSMENT & RISK CONTROL (HIRARC)

OBJECTIVE

- The principles and practices of OSH HIRARC
- When to conduct HIRARC/Risk Assessments
- Why HIRARC is important
- How to identify hazard and evaluate risk
- To identify types of Hazard in work area
- To suggest Risk Controls to Organization
- To implementing Risk Controls
- To review Risk Controls

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Content

OSH-MS (MS 1722:2003)

Key Elements

- Policy
- Organizing
- Planning And Implementation
- Measuring Performance
- Action for Improvement

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Why We Need OSH-MS

- Our Organization to be **No. 1**
- Increase "Return of Investment"
  - employees, money , time…..
- Safe work place

How To Start

- Organization should have vision
- Commitment from management
  - right people
  - resource
  - time

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How To Start

- Should have internal audit
- Management committee to review reports
- External audit
- Specific organization policy- hazard specific
- Employee's participation - meeting, training
- Safety as basic training

Introduction to HIRARC

- Principles used in workplace to manage safety and health.
- Section 15 (2)(a) of OSHA 1994:

  which reads " the provision and maintenance of plants and **systems of work** that are,so far as is practicable, safe and without risks to health"

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Overview Of HIRARC

- Definition of Hazards
- Classification of Hazards
- Potential sources of Hazards
- Basic components of Risk Management

Purposes of HIRARC

- To identify all the factors that may cause harm to employees and others (*the hazards*)
- To consider what the chances are of that harm actually befalling anyone in the circumstances of a particular case and the possible consequences that could come from it (*the risks*)
- To enable employers to plan, introduce and monitor preventive measures to ensure that the risks are adequately controlled at all times.

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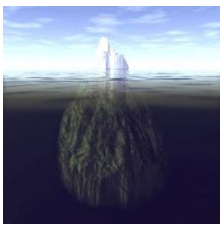
SECTION 1

HIRARC
Definitions and Concepts

What is a Hazard?

Source or situation with potential for harm in term of:

i. Human injury
ii. Ill health
iii. Damage to property
iv. Damage to workplace environment
v. Or combination of these



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What is a Risk?

Combination of the likelihood and consequence(s) of a specified hazardous event occurring.

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Risk – 2 Elements

- Likelihood that a hazard may occur (probability).
- Consequence(s) of the hazardous event (severity).

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Definition

- **Hazard**

  A source or a situation with a **potential for harm** to humans, property and damage of environment or a combination of these.
- **Danger**

  Relative exposure to hazard.
- **Risk**

  A combination of **likelihood** of occurrence and **severity** of injury or damage.

What is risk assessment?

Overall process of estimating the magnitude of risk and deciding whether or not the risk is tolerable.

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Risk Control

Measure taken to eliminate or mitigate the identified risks.

Other Definitions

- Tolerable risk – risk that has been reduced to a level that can be endured by the organization having regard to its legal obligations and its own OSH policy.
- Interested party – individual or group concerned with or affected by the OSH performance of an organization.

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The Process of Risk Management

Classify Activities
(Work, Product, Services)

↓

Identify Hazard

↓

Assess The Risk

↓

Risk Control

↓

Review Risk Control

Risk Management

Risk Management describes the total procedure associated with identifying a hazard, assessing the risk, putting in place control measures, and reviewing the outcomes.

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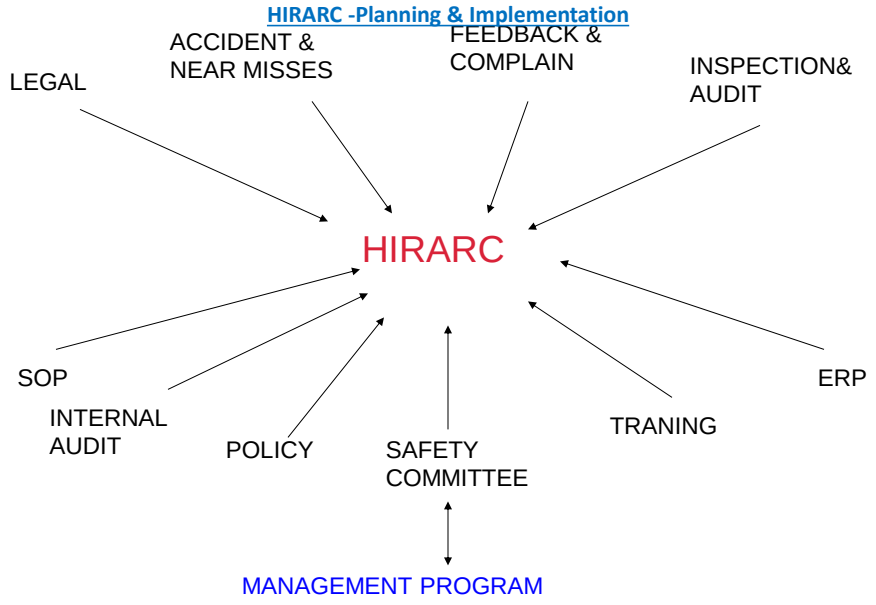
Planning of HIRARC

- Ongoing HIRARC activities
- HIRARC Covers:
  - Routine and non-routine activities
  - Activities of all personnel including non employees (contractors, visitors)
  - Facilities at the workplace



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SECTION 2

Process of HIRARC

When to Conduct HIRARC

- For situation:
  - Where hazard appear to pose significant threat
  - Uncertain whether existing controls are adequate
  - Before implementing corrective or preventive measures

• By organization intending to continuously improve OSHMS.

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HIRARC Process – 3 Basic Steps

1. Identify Hazard

2. Estimate risk from each hazard
   - Probability of occurrence
   - Severity of harm

3. Decide if risk is tolerable.

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Why is HIRARC Important?

- Legal obligations (certain countries).
- To determine whether existing or planned controls are adequate.
- "Risks should be controlled before harm could occur".

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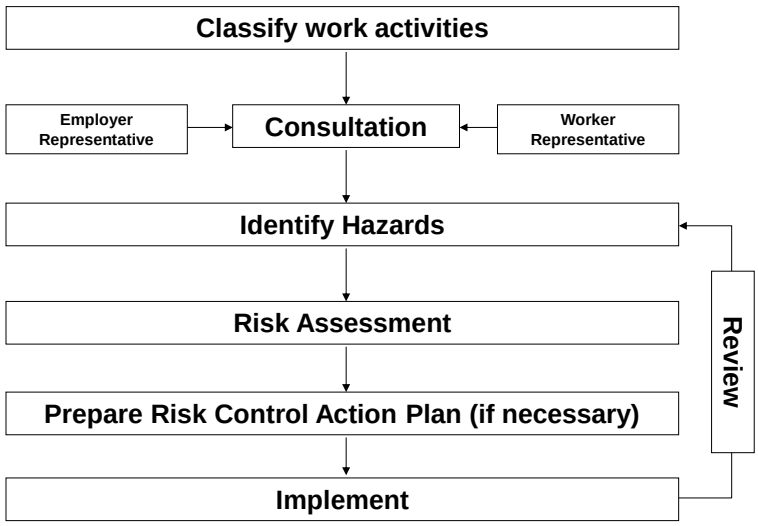
Criteria for HIRARC Process



Classify work activities

Possible ways.

- geographical or physical areas within/outside premises.
- Stages in production/service process
- Not too big. E.g. building a car
- Not too small. E.g. fixing a nut
- Defined task
  - e.g. loading, packing, mixing, fixing the door

Work activities Information Requirement

- Tasks carries out
  - duration & frequency
  - Site/location
  - Who involved/affected
  - Written system of work
- Plant/machinery used
- Tolls/equipment used
- MSDS/CSDS
- Services used
  - Compressed air, steam
- Type of material handled
- Distances/heights material to be moved
- Acts/Regulations/COP
- Reactive monitoring data
- Advice from specialist

Risk Assessment

Determine risk

Make a subjective assessment of risk associated with each hazard assuming that planned or existing controls are in place.

Decide if risk is tolerable

Judge whether planned or existing OSH precautions (if any) are sufficient to keep the hazard under control and meet legal requirements.

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Prepare risk control action plan (if necessary)

Prepare a plan to deal with any issues found by the assessment to require attention.

Organizations should ensure that new and existing controls remain in place and are effective.

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Implement

Execute the risk control plan.

Monitor the effectiveness of the plan.

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Review

Re-assess risks on the basis of the revised controls.

Check that risks will be tolerable.

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SECTION 3

HAZARD IDENTIFICATION

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Hazard Identification

- To keep workplace **safe** and **healthy.**

  -employers should make sure there are no hazards to which employees could be exposed.
- Employers should look for hazards in advance

  as part of their risk management plan to prevent potential hazards.

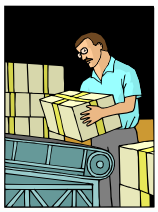
Classify Work Activities

Identify Hazards

Identify Hazards

Identify all significant hazards relating to each work activity.

Consider who might be harmed and how.



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Hazards Identification

1. Is there a source of harm?

2. Who could be harmed?

3. How harm could occur?

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Identify Hazards

General (Qualitative) methods

1. Previewing legislation and COP
2. Using hazard checklist
3. Conducting survey (audit), observation
4. Assessing competency of personnel
5. Analyzing reactive data (previous incidents data)
6. Analyzing work process
7. Through consultation with employees
8. MSDS/CSDS
9. Seeking advice from specialist
10. OSH Journal / publications

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SECTION 3.1

HAZARD IDENTIFICATION TOOLS

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Quantitative Methods

- Hazard and Operability Study (HAZOP)
- Failure Mode and Effects Analysis (FMEA)
- Job Safety Analysis (JSA)
- Fault Tree Analysis (FTA)

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HAZOP

- To identify hazard in process and operability problems.
- To study effects of deviation from process design condition.
- It takes a representation of a system and analyses how its operation may lead to an unsafe deviation from the intent of the system.

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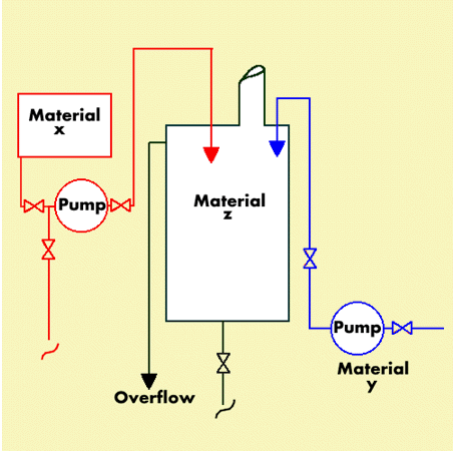
HAZOP



HAZOP

Guide Words

- None of …..
- More of …..
- Less of …..
- Part of …..
- As well as …..
- Reverse …..
- Other than …..

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FMEA

FMEA is a systematic approach to;

- Recognize and evaluate the potential failure of a product/process and the effects of that failure.
- Identify actions that could eliminate or reduce the chance of potential failure occurring.
- Document the entire process.

Types of FMEA

All FMEAs focus on the design, be it product or process:

- Design of FMEA (of product)
- Process FMEA (of process)

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FMEA

System	Component	Failure Mode	Failure Effect
Scrubber	Water pump	Inadequate water flow	Increased environmental pollution

Where are FMEA's currently used?

- Aerospace - Complex systems, processes and products
  Low volume manufacturer

- Automotive - Complex systems, processes and products
  High volume manufacturer

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When are FMEA applied?

- During the Advanced Product Quality Planning Process (APQP).
- Design FMEA applied during the product design and development.
- Process FMEA applied during process design and development.

JSA

- Ideally, all jobs should be subjected to JSA.
- Usually useful for non routine activities.

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JSA basic procedure

- Select job to be analyzed
- Define the scope of the job
- Organize the job into sequential logical steps
- Observe each job step to determine the hazards
- Develop preventive measure to eliminate the hazards

JSA

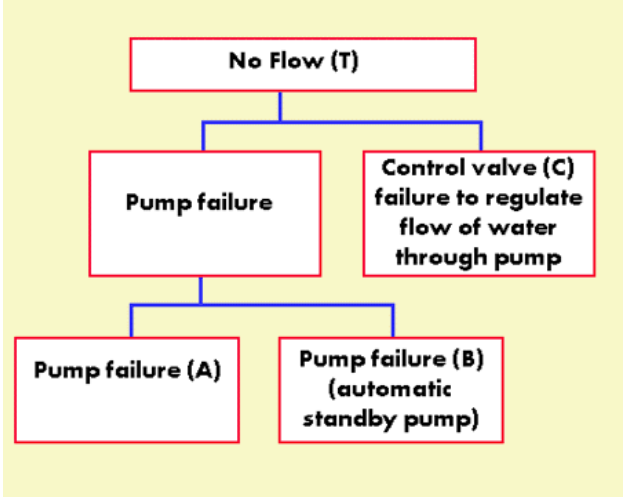
Examples of Job Steps in Changing a Flat Tire

Sequence of Job Tasks	Potential Hazards	Precautions & Resources
1 Park the vehicle in a safe place	1 a) Vehicle parked too close to passing traffic (collision hazard) b) Vehicle parked on uneven or soft ground (jack tip over during change of tire) c) Vehicle may roll on driver if not properly braked and blocked	1 a) Drive to area well clear of traffic and turn on emergency flashers b) Choose a firm, level area c) Apply the parking brake; leave transmission: (1) in gear; or (2) in PARK (depending on the type of transmission you have) d) Place blocks in front and back of the wheel diagonally opposite to the flat
2 Remove spare and tool kit	2 a) Muscle strain or hand injuries from lifting spare	2 a) Turn spare into upright position in the wheel well. Using your legs and standing as close as possible, lift spare out of truck and roll to flat tire. Use gloves to protect your hands
3 Pry off hubcap and loosen lug bolts (nuts).	3 a) Hub cap may pop off and hit driver due to excessive force or an unsafe work procedure b) Lug wrench may slip and cause hand injuries	3 a) Pry off hub cap with the tire iron using steady pressure b) Use proper lug wrench; slowly apply steady pressure and loosen the lug nuts
4 And so on...	4 a) ...	4 a)...

FTA

- **Shows the relation between system failure**
  - a specific undesirable event in the system, and failures of the components of the system
- **Technique based on deductive logic, using "AND" and "OR" gates**
- **An undesirable event is first defined and casual relationships of the failures leading to that event are then identified**
- **Based on factual approach**

FTA



SECTION 3.2

HAZARD TYPES

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Safety Levels

Prevention
- Mechanical Integrity
- Predictive/preventive maintenance
- Operator training
- Human factors
- Impact barriers
- Adequate procedure

Control
- Automatic Process control system
- Manual controls
- On-line spares
- Backup systems

Protection
- Alarms
- Operator intervention
- Interlocks, trips
- Emergency shutdown
- Last resort controls
- Emergency relief
- Ignition source control

Mitigation
- Emergency response
- Sprinkler, deluge
- Dike, trench
- Blast wall, barricade
- Water curtain
- Personal Protective Equipment

Hazard → **Cause** → **Deviation** → **Accidental Event** → **Impact**

Material/energy contained and controlled during normal operation
- Toxicity
- Flammability
- Reactivity
- Elevated pressure

etc.

Initiating event of process upset; start of accident event sequence
- Mechanical failure
- Procedural error
- External force
- Fouling etc.

Excursion beyond design/operating limits
- No flow
- High temperature
- Low level
- Impurities
- Wrong material
- Step omitted etc.

Loss of containment of process material/energy
- Fire
- Explosion
- Hazardous material
- Release etc.
- Other energy release

Severity of consequences; losses
- Illnesses/Injuries
- death
- Property damage
- business interruption
- Environmental damage etc.

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Classification & Potential Sources of Hazards

Classification	**Example of Hazards**
Mechanical	- Sharp points & edges, overload.
Electrical	- Insulation damaged or cover broken
Biological	- Exposed, airborne/blood borne microorganism.
Chemical	- Expose to carcinogens chemical
Ergonomics	- Expose to unnatural postures
Psychological	- Stress or violent at workplace.

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Classification of Hazards in construction

- Physical
- Electrical
- Mechanical
- Psychosocial
- Biological
- Chemical
- Ergonomics

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SOURCES OF HAZARDS

Man	Unsafe acts
Machinery	Installation, layout and design of equipment
Materials	Substances such as chemicals and gases use in the workplace
Method	The way people carry out their work
Media	Workplace condition i.e. air quality, ventilation, lighting, noise, vibration etc.

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Broad Categories of Hazards

- To facilitate hazards identification, useful to categorizes hazards in different ways, e.g. by topic;

  - ✓ Chemical
  - ✓ Physical
  - ✓ Biological
  - ✓ Ergonomics
  - ✓ Psychosocial
  - ✓ Mechanical
  - ✓ Electrical
  - ✓ Machinery

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Physical Hazards

PHYSICAL

- Noise/Vibration
- Extreme Temperature (Heat/Cold)
- Radiation
- Machinery/Equipment
- Height/Gravitational
- Electrical
- Fire/Explosion
- Confined Space
- Slip/Trip/Fall
- Vehicles
- Water

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Chemical Hazards

CHEMICAL

HEALTH
- Very Toxic
- Toxic
- Corrosive
- Harmful
- Irritant

PHYSICO CHEMICAL
- Explosive
- Oxidizing
- Extremely Flammable
- Highly Flammable
- Flammable

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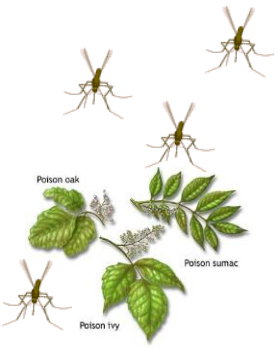
Biological Hazards

BIOLOGICAL

- Animals – Wild Dogs , Snakes, Scorpions
- Plants - Poisons, irritants, Rashes
- Bacteria – Legionella
- Viruses – Influenza, HIV, Hepatitis
- Yeast – Cryptococcus
- Fungi – Tineas
- Parasites – Ticks, Gardia,



Ergonomics Hazards

ERGONOMIC

- Repetitive Work - Prolonged Similar Task
- Manual Handling - Lifting, Pulling, Pushing, Twisting
- Computer Works - Sitting Posture, Eyes Strain
- Lighting - Adequacy of Light
- Ventilation - Indoor Air Quality

Psychosocial Hazards

PSYCHOSOCIAL

- Shift work - Prolonged night duty
- Stress - Multifactor
- Violence - Individual, Group
- Harassment - Sexual, Bullying

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Hazards

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Classification and Potential Sources of Hazards

Classification of Hazards	Example of Potential Sources of Hazards
Mechanical	Pinch points, sharp points and edges, overload or force a tool beyond its capabilities and grinding wheel without guard
Electrical	Electrical cord insulation damaged, electrical face plate or cover broken or missing and fan cord insulation pulled loose
Biological	Exposed to airborne and blood borne viruses, bacteria and fungus

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Classification and Potential Sources of Hazards

Classification of Hazards	Example of Potential Sources of Hazards
Chemical	Exposed to carcinogens chemicals, sensitizers and corrosive chemicals.
Ergonomics	Repeated exposure to unnatural postures and unnatural movement, wrong design of workstation, tools and task.
Psychological	Stress, sexual harassment and violent at work.

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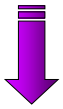
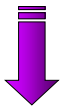
SECTION 4

RISK ASSESSMENT

Classify Work Activities



Identify Hazards



Risk Assessment

Determine Risk

Risk = Likelihood X Severity

Likelihood : likelihood the specified hazardous event occurring

Severity : consequence(s) of specified hazardous event occurring

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SECTION 4.1

ANALYZING RISK

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Likelihood of Occurrence

- Consider
  - -The availability of control measures
  - - The existing control measures
  - - Likelihood of failure of the control measures
  - - Legal requirements and Code of Practice covering controls of specific hazards

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Likelihood of Occurrence

- Consider:
  - No. of personnel exposed
  - Frequency & duration of exposure to hazard
  - Failure of services (electricity, water)
  - Failure of machinery & safety devices
  - Protection afforded by PPE

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Likelihood of Occurrence

- Consider unsafe acts by personnel who
  - unaware of hazards
  - do not have knowledge or skills to do the task
  - underestimate risks
  - overlook safety procedures

- Establish the ranking. Example;
  - Very unlikely
  - Unlikely
  - Likely
  - Most likely
  - Certain

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TIPS .....

Factors for consideration in a workplace risk assessment.

- Maintenance: Maintenance of structure, equipment, systems, 5S etc.
- Environmental Factors: Ventilation, Temperature control, Lighting, 5S, Room dimensions and space, workstations, seating etc.
- Structural Features: Floor & traffic routes, transparent windows & doors, gates, escalator etc.

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TIPS .....

- Fire Protection
- Emergency Procedure
- Vehicle Movements
- Electrical Installations and Appliances
- Information, Instruction, Training and Supervision

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TIPS …..

Factors for consideration in a work equipment risk assessment.

- **Suitability**
- **Maintenance**
- **Specific Risk**
  - Only be used by designated and trained user.
- **Information, Instructions and Training**
- **High or very low temperature**

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TIPS …..

- **Controls**
  - Stop controls, emergency stop controls, controls etc.
- **Stability**
- **Lighting**
- **Markings and Warnings Sign**

TIPS …..

Factors for consideration in a health risk assessment.

- Substances or type of substances
- Effects of the substances
- Location and form (gas, fumes, mist etc.)
- Exposure Duration (including OSHA requirements)
- Storage Requirements
- Air Monitoring & Health Surveillance Requirements
- Information, Instruction and Training

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TIPS …..

Factors for consideration in a noise risk assessment.

- **Noise exposure records**
  - Noise mapping, Audiometric Test etc.
- **Action taken**
- **Noise control programmes**
- **Information, Instruction and Training**

Likelihood of Occurrence

Very unlikely (1)	Unlikely (2)	Likely (3)	Most Likely (4)
The probability to happen is extremely small (<1%)	Could happen, however very rare (1 – 9%)	Chances to happen is relatively high (10 – 59%)	Can happen frequently (60 – 100%)

Severity of Harm

- To establish potential severity of harm, consider
  - part(s) of the body likely to be affected
  - nature of harm
  - nature of property damage
  - establish the ranking. Example;
    - Negligible
    - Minor
    - Major
    - Critical
    - Catastrophe

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Severity of Harm

Risk Level	Nature of Injury	Nature of Property Damage
Negligible (1)	First aid only	Unnoticeable damage
Minor (2)	Medical treatment, Outpatient	Damage with repair cost < RM1K
Major (3)	Hospitalized, disabling injury, recoverable	Significant damage with repair cost > RM1K but < RM50,000
Critical (4)	Permanent Disability, Single casualty, Multiple casualty	Heavy damage with repair cost > RM50K but < RM0.5M; or more Damage cost > RM0.5M

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SECTION 4.2

EVALUATION OF RISK

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RISK RATING

Risk Rating = Existing Control Measure (ECM) X Frequency (F) X Likelihood (L) X Severity (S)

Likelihood : likelihood or probability that an accident or incident could occur

Severity : consequence(s) that an accident or incident could occur (in terms of injury, damage or loss)

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Jadual : Ukurtara kemungkinan (kualitatif)

TAHAP	KEMUNGKINAN	KETERANGAN
4	Sangat mungkin	Kejadian boleh berlaku dengan kerap (setiap hari)
3	Mungkin	Kejadian boleh berlaku sekali-sekala (setiap minggu)
2	Tidak mungkin	Kejadian boleh berlaku tetapi jarang (setiap bulan)
1	Sangat tidak mungkin	Kejadian boleh berlaku tetapi kemungkinan tidak (setiap tahun)

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Jadual : Ukurtara keterukan (kualitatif)

TAHAP	AKIBAT	KETERANGAN
1	Kecederaan yang boleh diabaikan	Kecederaan hanya memerlukan pertolongan cemas di tempat kerja/saja kemalangan hampir
2	Kecederaan ringan	Cedera atau sakit yang memerlukan cuti daripada kerja (maksimum 4 hari)
3	Kecederaan teruk	Hilang upaya sementara atau cuti sakit melebihi 4 hari
4	Kematian	Kematian atau hilang upaya kekal

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Jadual : Jadual Risiko Kuantitatif

AKIBAT		KEMUNGKINAN			
		Sangat Mungkin	Mungkin	Tidak Mungkin	Sangat Tidak Mungkin
		4	3	2	1
Kematian	4	Tinggi	Tinggi	Tinggi	Sederhana
Kecederaan Teruk	3	Tinggi	Tinggi	Sederhana	Rendah
Kecederaan Ringan	2	Tinggi	Sederhana	Sederhana	Rendah
Kecederaan yang Boleh Diabaikan	1	Sederhana	Rendah	Rendah	Rendah

Formula Penaksiran Risiko:

Risiko = Akibat x Kemungkinan

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RISK MATRIX

Example

CONSEQUENCE	LIKELIHOOD			
	Very Likely	Likely	Unlikely	Highly Unlikely
Fatality	HIGH	HIGH	HIGH	MEDIUM
Major injuries	HIGH	HIGH	MEDIUM	MEDIUM
Minor injuries	HIGH	MEDIUM	MEDIUM	LOW
Negligible injuries	MEDIUM	MEDIUM	LOW	LOW

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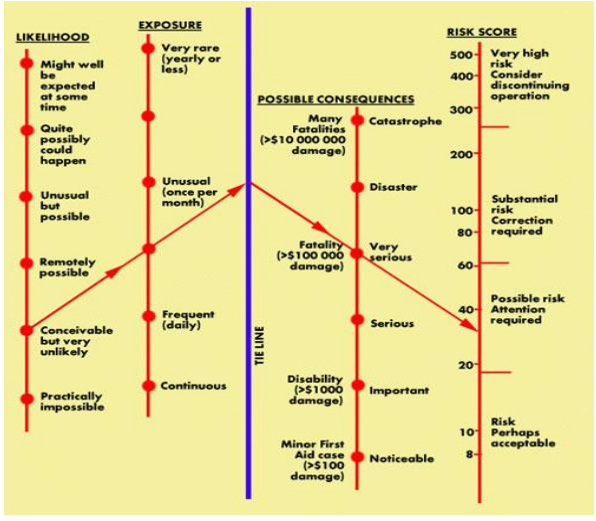
Nomogram



Nomogram for analyzing risk and cost justification (from G. F.Kinney and A. D. Wiruth, Practical Risk Analysis for Safety Management).

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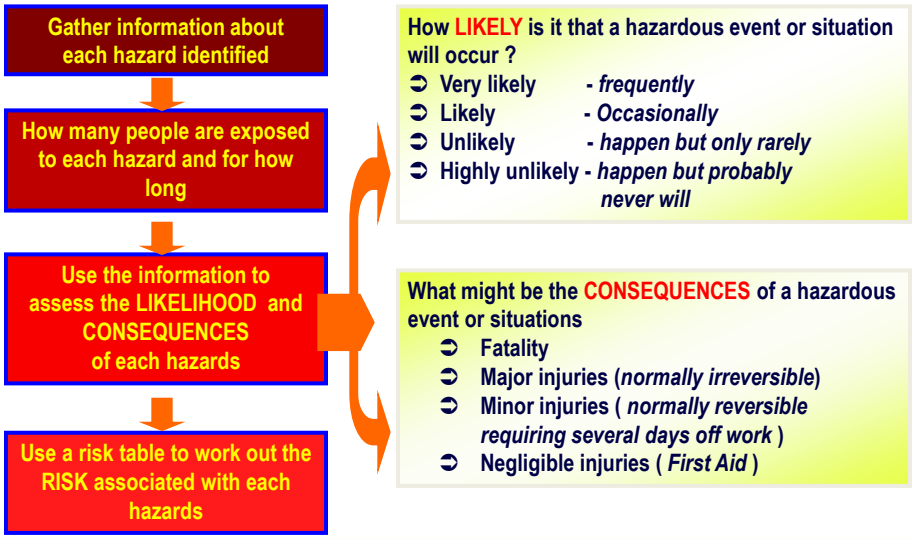
Risk Assessment



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Is the RISK tolerable ?

- **IF YES !**
  - Leave them alone,
  - But need **MONITORING**……...
- **IF NO !**
  - Need **CORRECTIVE /PREVENTIVE MEASURES**.

Actions & Recommendations

- All related statements should be made
- With no cost restrains
- Should be reviewed every 4 months
- Need management support

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Risk Assessment

- Is the process of evaluating the risk to safety & health from hazards at work

Types

- Qualitative
- Semi-quantitative
- Quantitative

How To Assess Risk

1) Look for the Hazards
2) Decide who might be harmed & how
3) Evaluate the risk and check what is done to prevent it from happening
- 4) Record finding
- 5) Review assessment and revise it if necessary

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Types of Risk Assessment

- Qualitative - (Use Risk Matrix)
  -table scales for likelihood and severity
- Fatality
- Major injuries
- Minor injuries
- First aid or near misses

Types of Risk Assessment

- Based on statistic
  Likelihood
- Very likely
- Likely
- Unlikely
- Highly Unlikely

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Qualitative Risk Table

Severity	Likelihood			
	V/Likely	Likely	Unlikely	H/Unlikely
Fatality	High	High	High	Medium
Major Injuries	High	High	Medium	Medium
Minor Injuries	High	Medium	Medium	Low
First Aid/ N/misses	Medium	Medium	Low	Low

Semi-Quantitative Risk Assessment

Severity Categories

1. First Aid
2. Less than 4 days M/C
3. More than 4 days M/C
4. Fatality & Permanent Disability

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Semi-Quantitative Risk Assessment

Likelihood Occurrence

1. Yearly
2. Monthly
3. Weekly
4. Daily

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Semi-Quantitative Risk Table

		LIKELIHOOD				
SEVERITY			Yearly	Monthly	Weekly	Daily
			1	2	3	4
	First Aid	1	1	2	3	4
	< 4 Days MC	2	2	4	6	8
	> 4 Days MC	3	3	6	9	12
	Fatality & Permanent Disability	4	4	8	12	16

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Quantitative Risk Assessment

- In cases where hazards are numerous and complex eg; Chemical process plant

- Should have Job Safety Analysis (JSA)
- describe job in less than 10 steps
- List things that can go wrong
  - eg; Changing a Car Wheel

SECTION 5

RISK CONTROL APPROACH

Selection of Risk Controls

- **Eliminate hazards**
- **Substitution**
  - Using less hazardous chemicals
- **Engineering Control**
  - Isolation
  - Safety switch
  - Adapt work to individual
  - Local exhaust ventilation (LEV)
  - Water spray
  - Machine Guarding
  - Detection system
  - Enclosure / closed system

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Selection of Risk Controls

- **Administration Control**
  - Planned maintenance
  - Emergency preparedness and Response (ERP)
  - Training – on work instruction, PPE, ERP, safe handling etc.
  - Competency requirement
  - Signage
  - Procedure, work instruction
  - Medical Surveillance
  - Supervision
  - Hygiene practice

Selection of Risk Controls

- **PPE as last resort**
  - Safety helmet
  - Safety shoes
  - Body harness
  - Protective clothing
  - Goggle
  - Face shield
  - Mask/Respirator – dust, vapor, fume, gas
  - Glove
  - Ear plug

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Selection of Risk Controls

Classify Work Activities

↓

Identify Hazards

↓

Risk Assessment

↓

Prepare risk control action plan

↓

Review adequacy of action plan

Review adequacy of action plan

- Tolerable risk achieved?
- New hazard created?
- Is it cost effective?
- Control practical?

When to Review HIRARC

The HIRARC will be reviewed and maintained as follows:

- As part of the annual management review process
- As a consequence of any significant changes to the organization's activities, products or services
- As a consequence of any relevant changes to the register of applicable legislation
- As a consequence of feedback from non-conformances identified during internal or external audit process

Managing HIRARC

- Incorporate into OSH objectives
- Continuing process
  - Feedback loop from subsequent experience to amend HIRARC, if necessary
- Proactive measure, not reactive.
- Review at a pre-determined time or period

Actions & Recommendations

- EL- Eliminate
- SL- Substitute
- IS- Isolation
- EC- Engineering Control
- AC - Administration Control
- PPE- Personal Protection Equipment

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Actions & Recommendations

Eg;

EL - stop work, cover hazard…

SL - use other route, other material..

IS - put up temporary barrier,…

EC - construct permanent wall,..

AC - put up notice, job rotation,…

PPE - gloves, respirator,……

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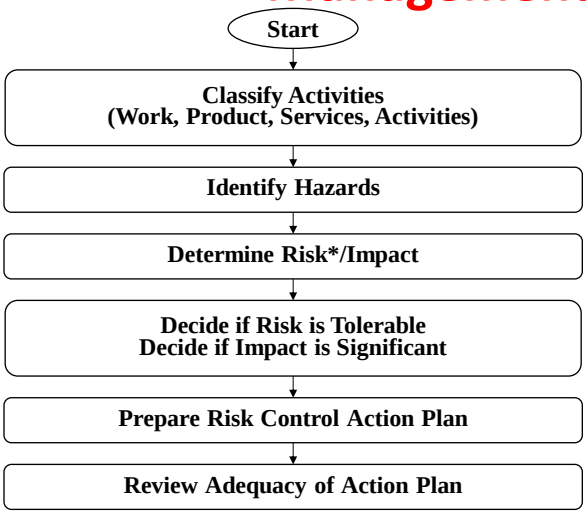
The Process of Safety Risk Management



*Risk =
Harm X Likelihood

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Conclusion

Hazard identification, risk assessment, control and review is not a task that is completed and then forgotten about.

Hazard identification should be properly documented even in the simplest of situations

Risk assessment should include a careful assessment of both **likelihood** and **consequence**. Control measures should conform to the recommendations of the hierarchy of control.

The risk management process is an on going one.

Terima Kasih

Be Safety Minded Be Safety Smart,
Think of Safety Before You Start.

THINKSAFE
WORKSAFE