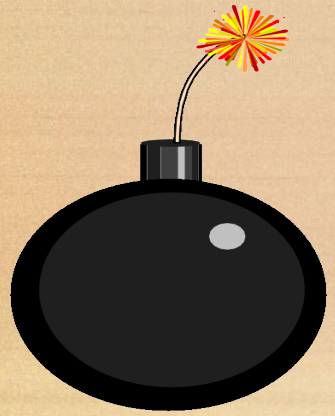
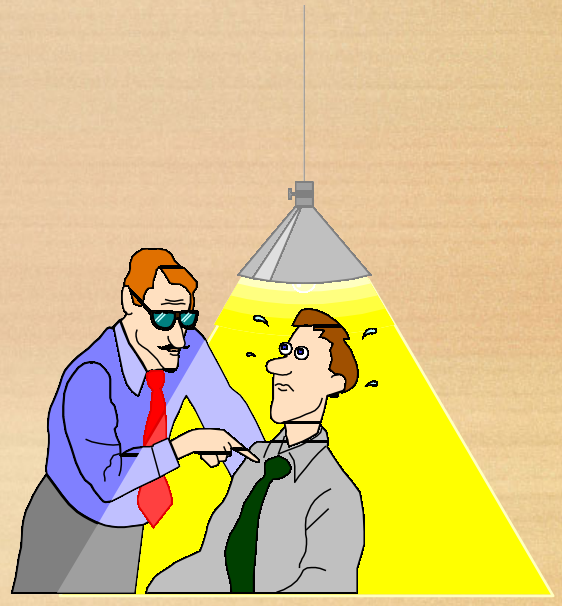
ABI 2206 Airline Safety Management

Unit 5
Risk Assessment

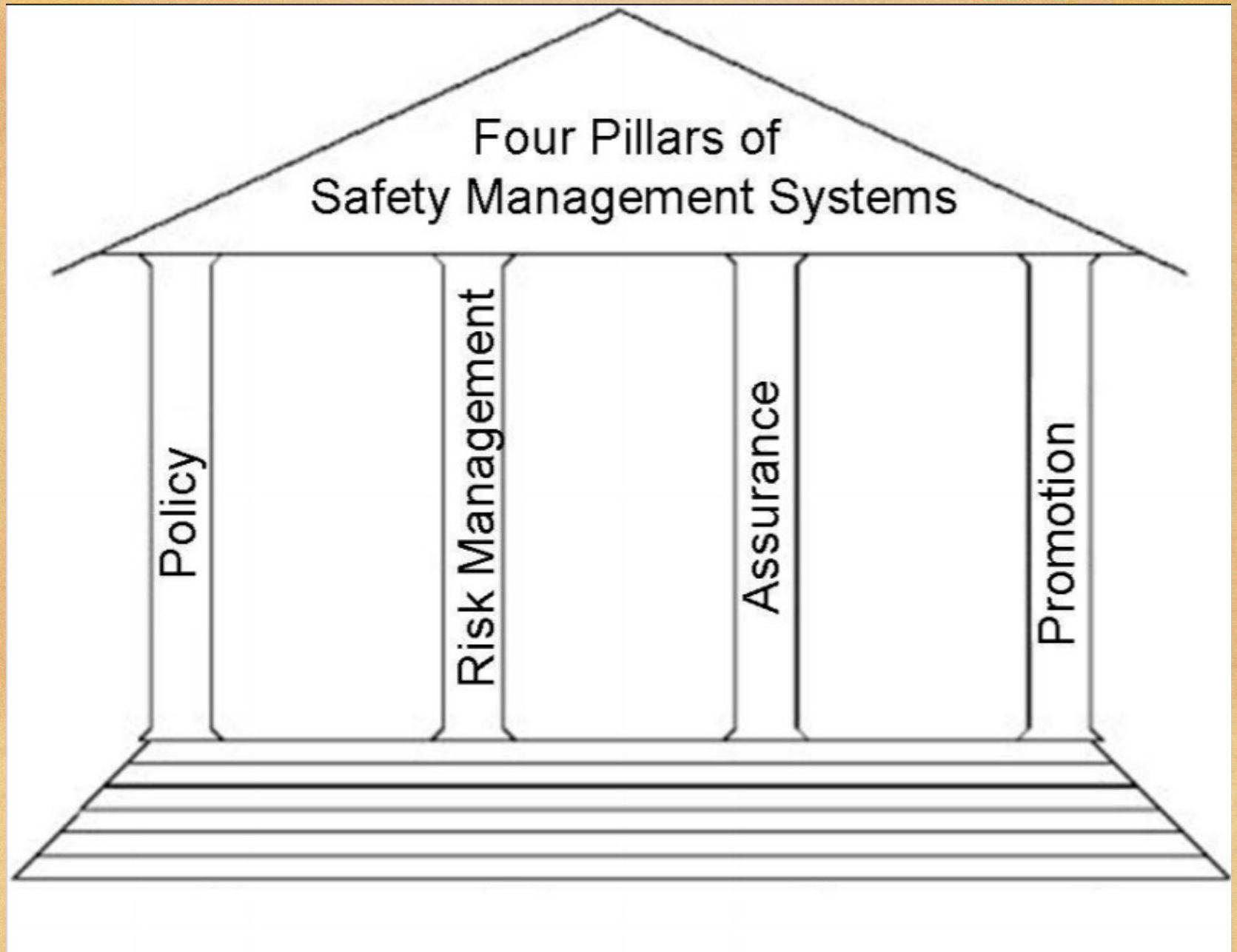


Learning Objectives

- Capable to explain 4 pillars of SMS
- Know the key term Risk and Hazard
- Identify hazard effectively
- List the steps of risk assessment



SMS, It built around 4 pillars



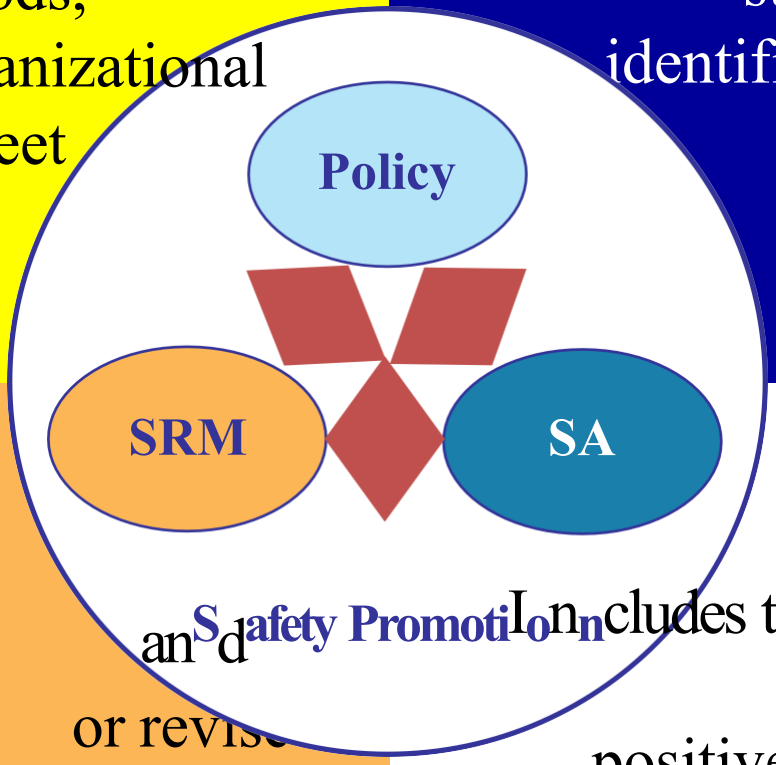
The Four SMS Components

Safety Policy

Establishes senior management's commitment to continually improve safety; defines the methods, processes, and organizational structure needed to meet safety goals

Safety Assurance (SA)

Evaluates the continued effectiveness of implemented risk control strategies; supports the identification of new hazards



Safety Risk Management (SRM)

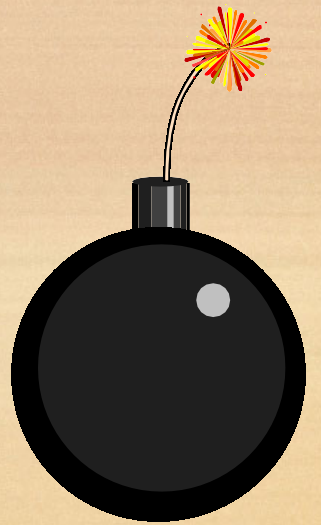
Determines the need for, and adequacy of, new or revised risk controls based on the assessment of acceptable risk

Safety Promotion

Includes training, communication, and other actions to create a positive safety culture within all levels of the workforce

Definition – HAZARD

- A condition or object with the potential of causing injuries to personnel, damage to equipment or structures, loss of material, or reduction of ability to perform a prescribed function.
- e.g. - Toxic or flammable substances, electric energy, working at heights etc.



Hazards

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Something that has the potential to cause harm to people, property or environment.

Classification of Hazards

Physical Hazards

Any hazard that Comes from Environmental factors

Psychosocial Hazards

Any occupational hazard that affects the psychological well-being of workers

Chemical Hazards

Any hazard that comes from Solid, Liquid or gas elements

Ergonomic Hazards

Physical factor within the environment that harms the musculoskeletal system

Biological Hazards

A living organism that have a potential to poses a threat to human health

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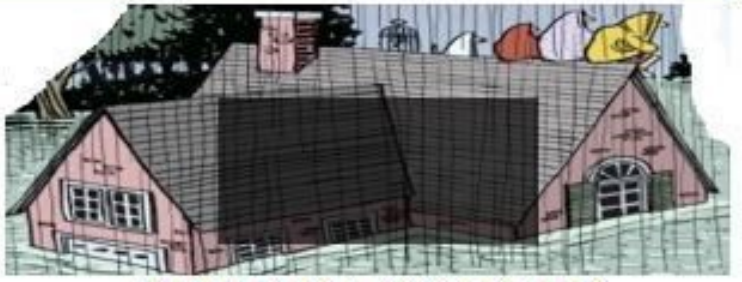
What is a Hazard?

Physical Hazards

Biological Hazards



NATURAL HAZARD

Chemical Hazards

Ergonomic Hazards

ANTHROPOGENIC HAZARD

Safety Hazards

Psychological Hazards

TECHNOCOLOGICAL HAZARD

Something which has the potential to cause harm.

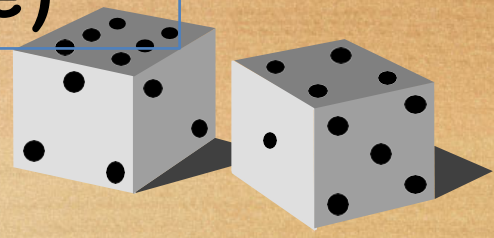
Risk

Risk means the chance that someone will be harmed by the hazard or The probability of harm occurring

Risk = Hazard effect(*(severity)*

X

Probability (likelihood of Occurrence)



- **Likelihood** that a hazard will cause a specific harm or injury to person or damage property

- **Severity** of injury or ill health that may be caused by the event or exposure(s)


HAZARD
VS
RISK
A HAZARD is something that has the potential to harm you
RISK is the likelihood of a hazard causing harm

hazard vs. risk

campylobacter in raw chicken is a **hazard**

eating undercooked chicken is a **risk**

eufic

Hazard vs. Risk

A Hazard is something that has the **potential to harm you**

Risk is the **likelihood** of a hazard **causing harm**

SHARK

A shark in the sea **is a hazard**

Swimming with a shark **is a risk**

LIGHTNING

Lightning **is a hazard**

Standing under a tree during a thunderstorm **is a risk**

efsa
European Food Safety Authority

EFSA is the keystone of EU risk assessment regarding food and feed safety. In close collaboration with national authorities and in open consultation with its stakeholders, EFSA provides independent scientific advice and clear communication on existing and emerging risks.

www.efsa.europa.eu

Example: Salmonella in egg is a hazard

if eaten raw

the chance of exposure is high

the **risk** of food poisoning is **high**

correct food handling for instance cooking thoroughly kills Salmonella bacteria

the chance of exposure is low

the **risk** of food poisoning is **low**

HAZARD

is the potential
to cause harm

when crossing a road,
cars are a hazard

RISK

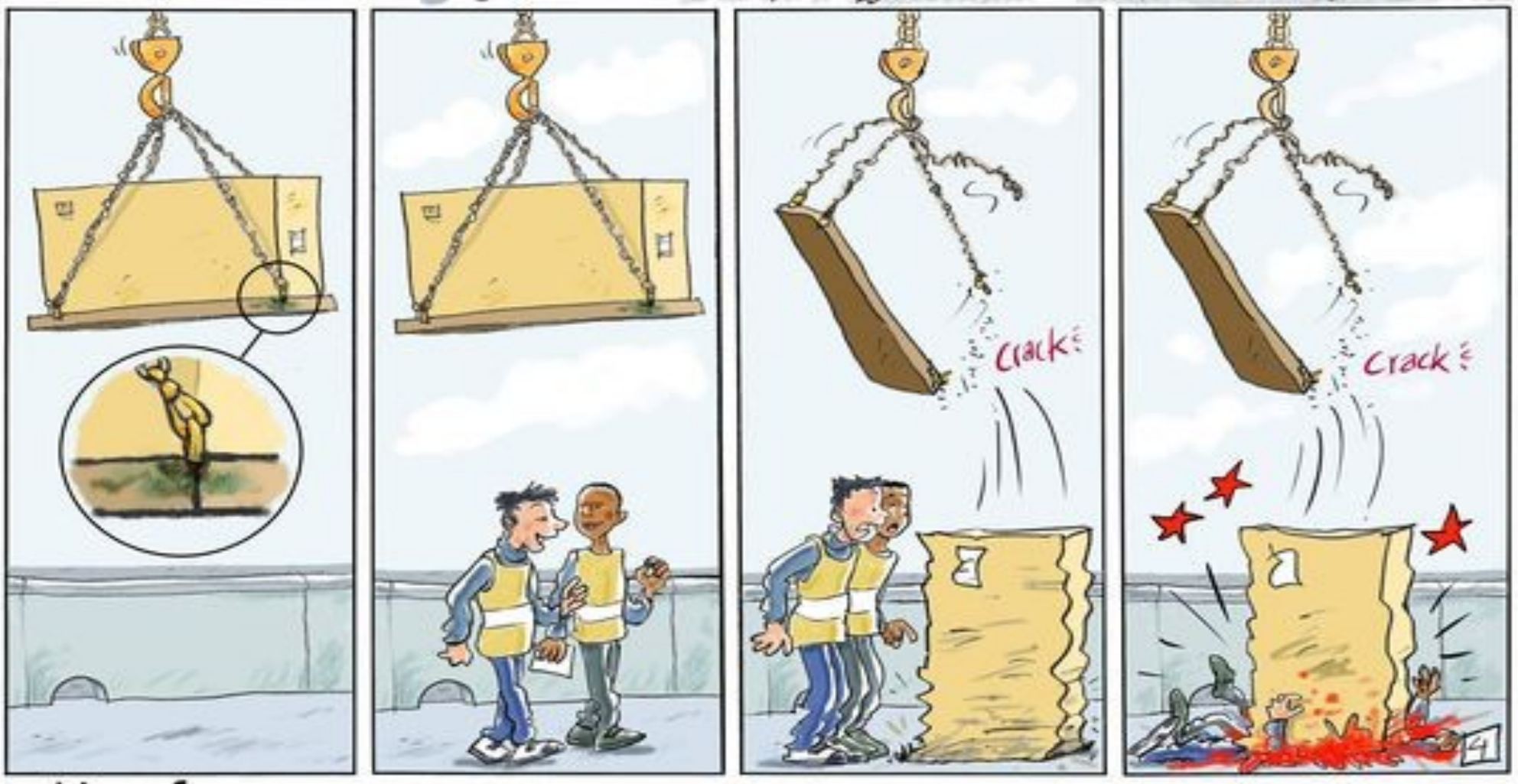
is the likelihood of
harm taking place

when crossing
a highway, the risk of an accident is **high**

when crossing
a country road, the risk of an accident is **low**

eufic

the rusty lifting gear



Unsafe condition. ◦ Unsafe act ◦ Near miss ◦ Accident

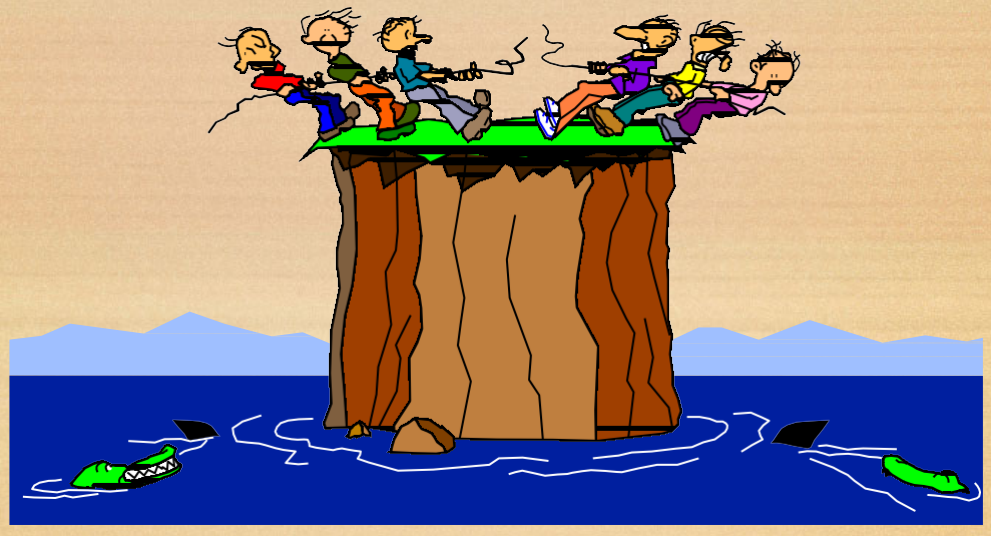
SEA HEALTH & WELFARE

Example of Risk Assessment

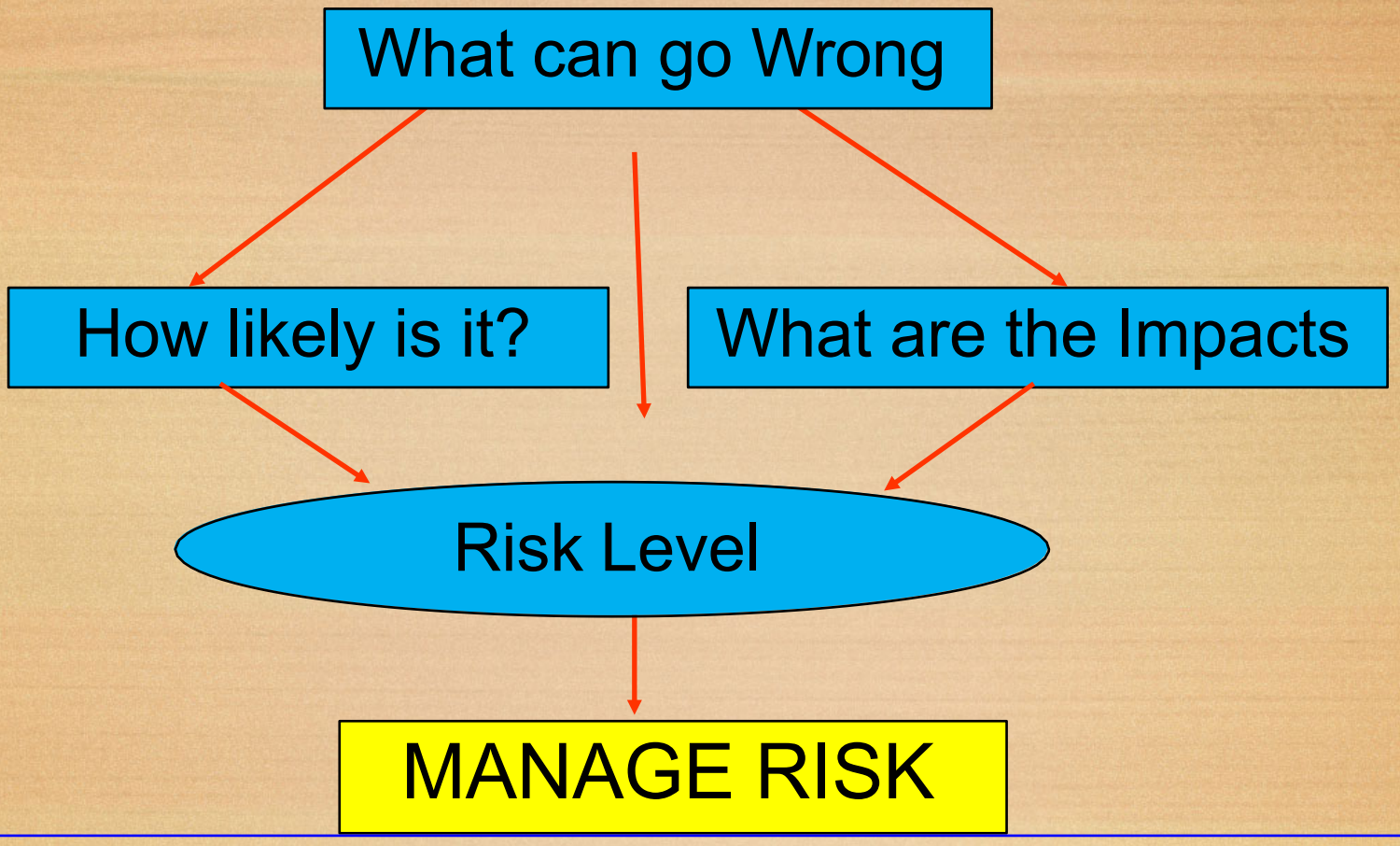
Task	Hazard	Risk
Delivering product to customers	Drivers work alone	May be unable to call for help if needed
	Drivers have to occasionally work long hours	Fatigue, short rest time between shifts
	Drivers are often in very congested traffic	Increased chance of collision Longer working hours
	Drivers have to lift boxes when delivering product	Injury to back from lifting, reaching, carrying, etc.

What is Risk Assessment?

- Risk Assessment is a systematic approach to identify hazards, evaluate risk and incorporate appropriate measures to manage and mitigate risk for any work process or activity. By doing so, you have created a safer and healthier workplace.

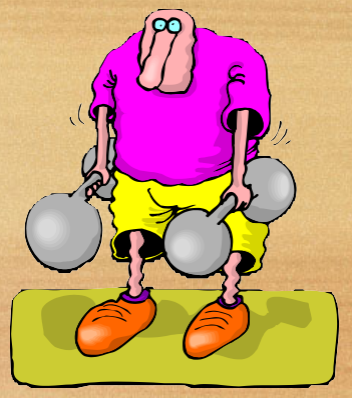


Risk Concepts



Risk management also includes control and monitoring of risks, as well as communicating these risks.

Risk Assessment Process



System description

Hazard Identification

Risk analysis

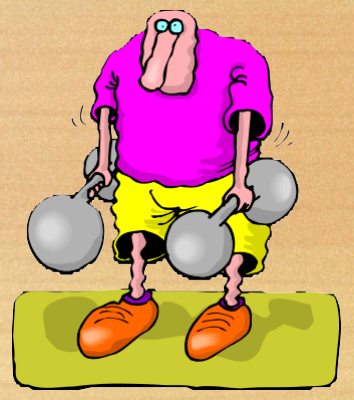
Risk assessment

Risk control

- IDENTIFY the hazard
- ASSESS the risks and available control measures
- MANAGE the risk
  - CONTROL the risks through implementation of appropriate control measures
  - MONITOR the controls to evaluate their effectiveness
  - Communication of Risks & Controls

WHY we need to do Risk Assessment (RA)?

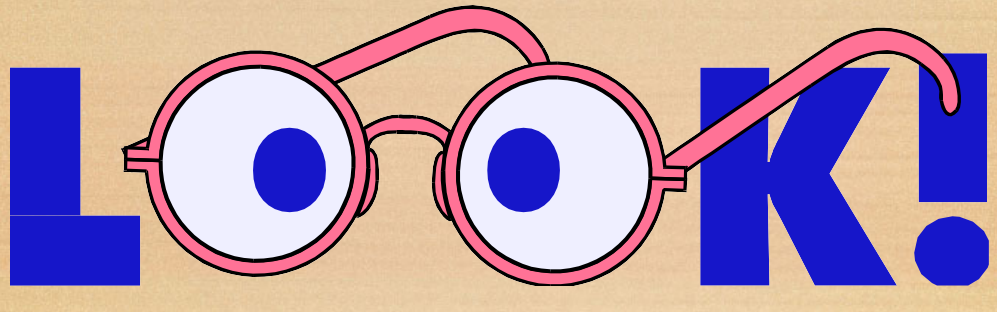
- Protect Ourselves
  - RA is key to prevention of accident
- Elevate safety awareness & ownership
  - Aware of hazards, risks and controls and practicing safe science
- University and Faculty Procedures
- Compliance with Regulations



5 Steps To Risk Assessment

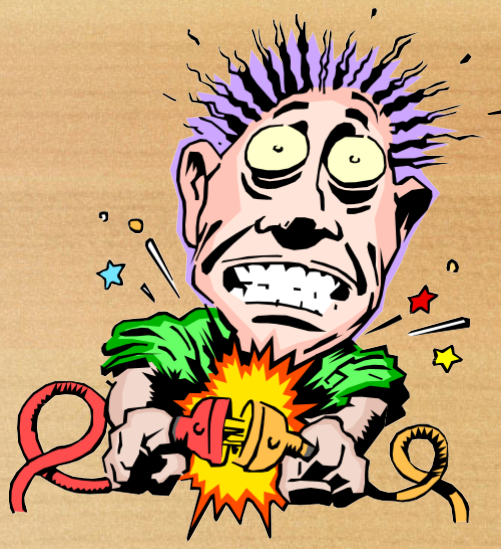
Identify the hazards

Step One



Methods Of Identifying Hazards

- Safety journal, information
- Safety audits (Internal, external)
- Consultation with other co-workers
- Accident reports

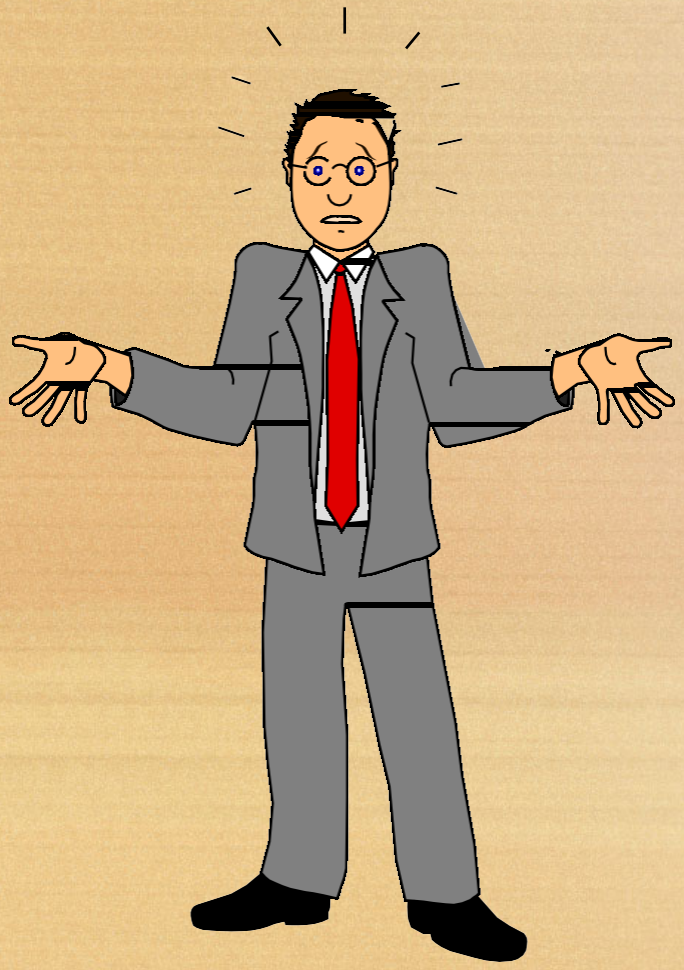


Hazards may be identified in

- Environments (light, noise, rain, heat, sun)
- Workplace layout
- Work organization (unnecessary manual handling)
- Equipment

Step Two

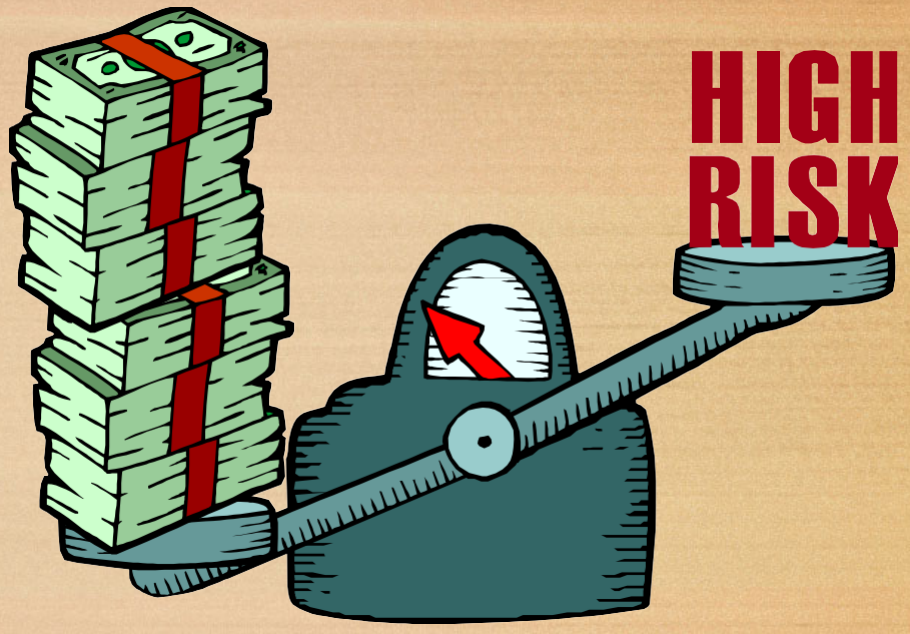
Identify who might be harmed



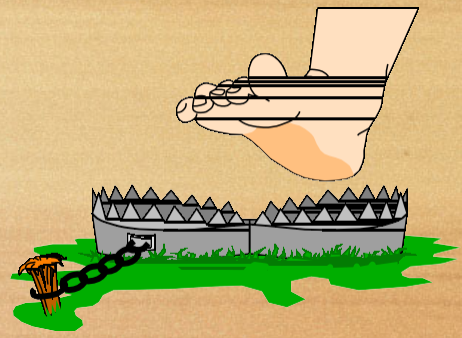
Who Might Be At Risk

- Must be people specific

- Employees
- Suppliers
- Visitors, passenger
- General public
- Children
- People who share the workplace



Step Three



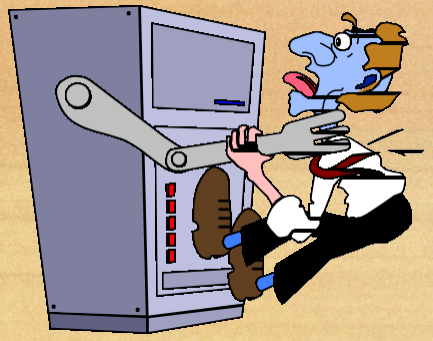
Evaluate the risks

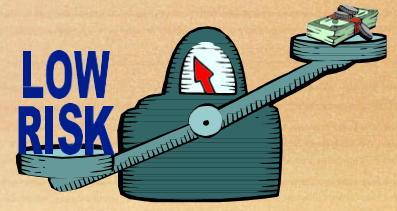
1. Risk Analysis

Hazards and hazardous situations are systematically identified.

2. Risk Evaluation

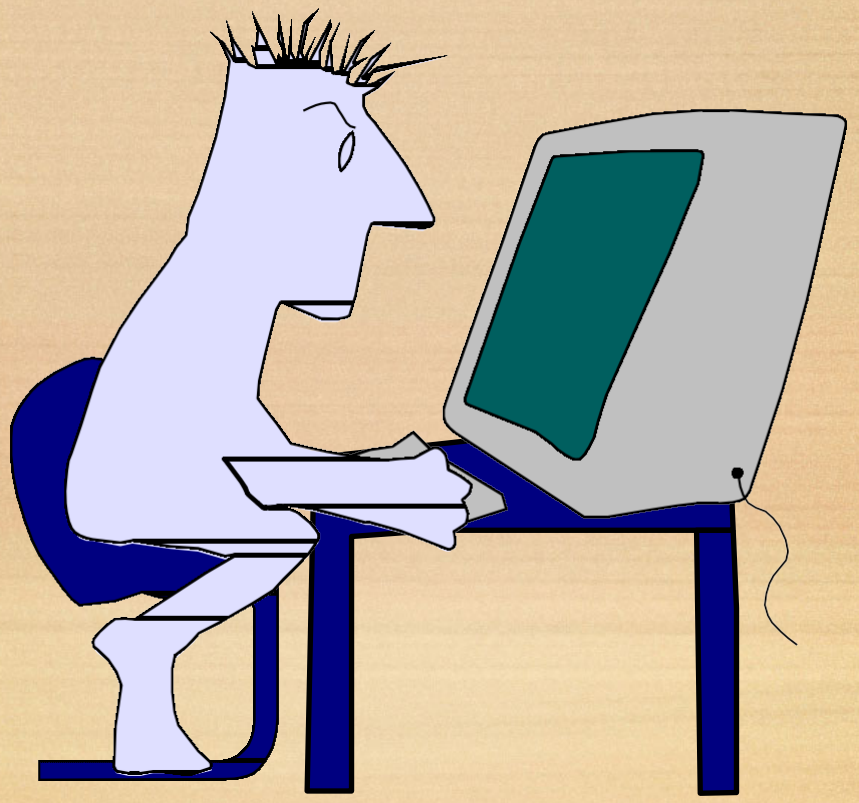
A judgement is made as to whether the level of risk is acceptable or unacceptable





Step Four

Record your findings



Recording the Risk Assessment

- Risk area description
- The hazards that personnel may be exposed to
- Details of which hazards are significant and those which are acceptable (and why)
- The precautions in place, or to be put in place, to reduce the significant hazards to acceptable levels

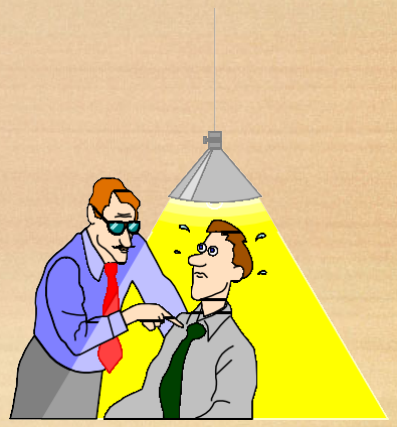
Recording the Risk Assessment

- How the precautions are to be maintained (management of systems, inspection of physical precautions etc.)
- Emergency Procedures
- Details of person completing the risk assessment
- Date, department details,. etc.

Step Five

Review the assessment

Must be kept current and regular revisited



5 Steps
to Risk Assessment

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01 Identify the hazards

One of the most important aspects of your risk assessment is accurately, identifying the potential hazards in your workplace.

02 Decide who might be harmed and how

For each hazard you need to be clear about who might be harmed. It will help you identify the best way of controlling the risk

03 Evaluate the risks and decide on controls

Having identified the hazards, you then have to decide how likely it is that harm will occur.

04 Record significant findings

Make a record of your significant findings

05 Review your assessment and update if necessary

Risk Assessments must be kept current and regularly revisited to ensure change is managed and controlled

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Risk Assessment Matrix

Ranking or prioritizing hazards is one way to determine which risk is the most serious and to control first.

A risk assessment matrix is a chart that plots the severity of an event occurring on one axis, and the probability of it occurring on the other.

These forms are more complex, and involve identifying risks, gathering background data, calculating their likelihood and severity, and outlining risk prevention and management strategies.

1. Likelihood: the probability of a risk

2. Consequences/ Severity: the severity of the impact or the extent of damage caused by the risk.

Likelihood table (basic)

Level	Descriptor	Description
A	Certain/ frequent	Is expected to occur in most circumstances
B	Likely/ occasional	Will probably occur at some time
C	Possible/ moderate	Might occur at some time
D	Unlikely/ improbable	Could occur at some time
E	Exceptional/ rare	May occur only in exceptional circumstances

Severity table (basic)

level	Descriptor	Description
1	Insignificance/ Negligible	No significance to aircraft-related operational safety
2	Minor	Degrades or affects normal aircraft operational procedures
3	Moderate	Partial loss of significant/major aircraft systems or results in abnormal application of flight operations procedures
4	Major	Complete failure of significant/major aircraft systems or results in emergency application of flight operations
5	Catastrophic	Loss of aircraft or lives

		Consequences				
		Insignificant (1) No injuries / minimal financial loss	**Minor (2)** First aid treatment / medium financial loss	**Moderate (3)** Medical treatment / high financial loss	**Major (4)** Hospitable / large financial loss	**Catastrophic (5)** Death / massive financial loss
kelihood	**Almost Certain (5)** Often occurs / once a week	Moderate (5)	High (10)	High (15)	Catastrophic (20)	Catastrophic (25)
	Likely (4) Could easily happen / once a month	Moderate (4)	Moderate (8)	High (12)	Catastrophic (16)	Catastrophic (20)
	Possible (3) Could happen or known it to happen / once a year	Low (3)	Moderate (6)	Moderate (9)	High (12)	High (15)
	Unlikely (2) Hasn't happened yet but could / once every 10 years	Low (2)	Moderate (4)	Moderate (6)	Moderate (8)	High (10)
	Rare (1) Conceivable but only on extreme circumstances / once in 100 years	Low (1)	Low (2)	Low (3)	Moderate (4)	Moderate (5)

	Likelihood (P)				
Severity (S)	Rare (1)	Unlikely (2)	Possible (3)	Likely (4)	Almost certain (5)
Insignificant (1)	1	2	3	4	5
Minor (2)	2	4	6	8	10
Moderate (3)	3	6	9	12	15
Major (4)	4	8	12	16	20
Catastrophic (5)	5	10	15	20	25

Intolerable (unacceptable) risks (25)	Work should not be started until the identified risks reach to an acceptable level. If there is an ongoing activity, it should be immediately stopped. Unless it is possible to reduce the risks despite the precautions, activities should be avoided.
Significant risks (15, 16, 20)	Work should not be started until the identified risks should be stopped immediately. If there is an ongoing activity, it should be stopped. If the risk is concerned with the continuation of the work, emergency precautions must be taken.
Intermediate risks (8, 9, 10, 12)	Actions should be initiated to reduce the identified risks. It may take time for risk reduction preventions.
Acceptable risks (2, 3, 4, 5, 6)	There is no need to plan control processes in order to to eliminate the identified risks. However, the existing controls should be maintained and these controls should be monitored.
Insignificant risks (1)	There is no need to plan control processes in order to to eliminate the identified risks and to keep records of the activities to be carried out.

Advantages of Risk Matrix for Risk Assessment

1. Helps in prioritizing the Risks with the level of severity.
2. In planning risks, it helps with neutralizing the possible consequences.
3. Helps in analyzing the potential risks with minimal effort.
4. Assists in improving the safety measures of the organization.
5. Gives an overall view of the potential risks of a project to the team.

RISK CONTROL

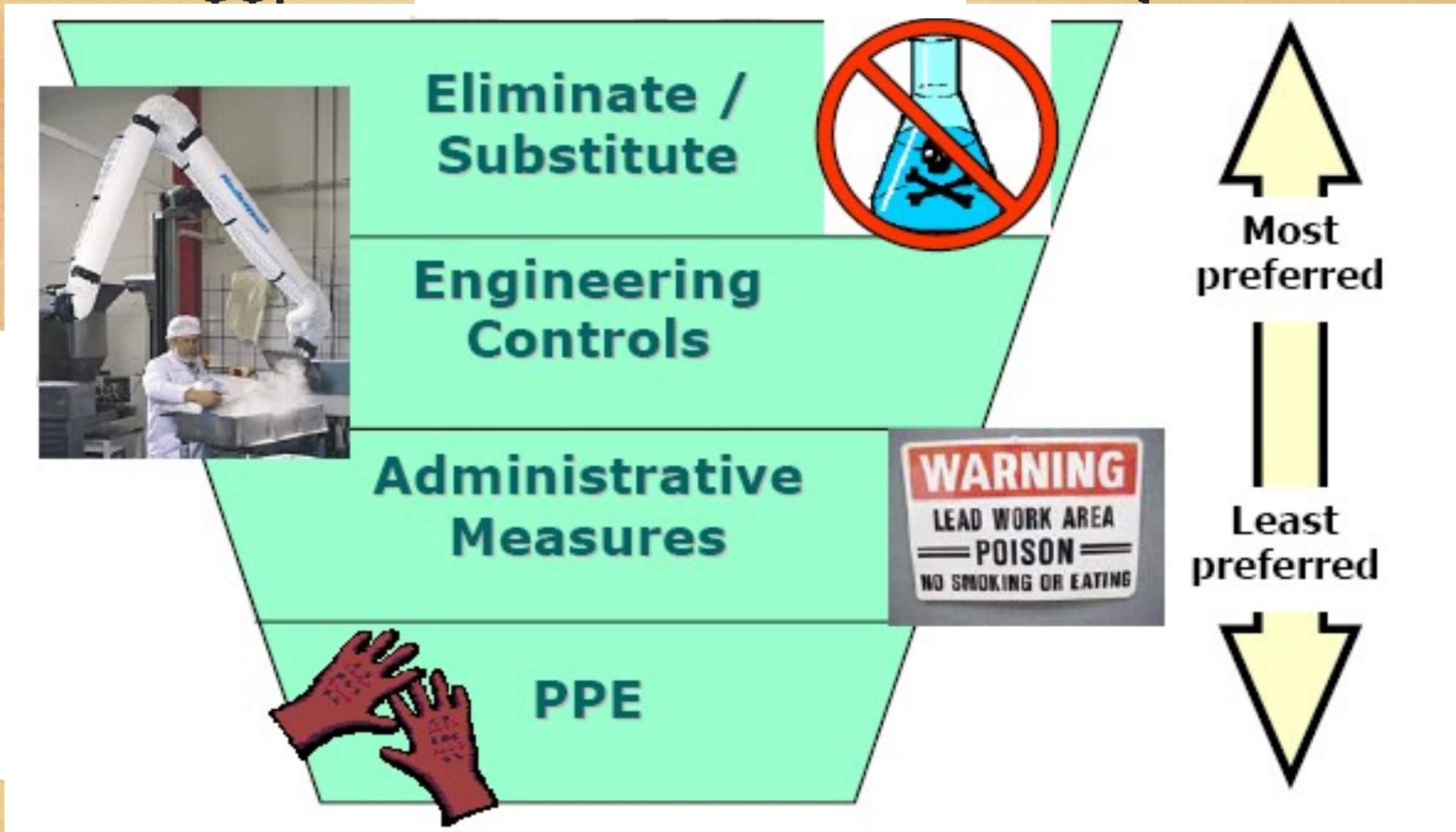
What can be done to control risks in the workplace ?

Some measures are : (from most to least preferred)

- Elimination – eliminate the hazard from the workplace
- Substitution - substituting a hazardous substance or process with a less hazardous one.
- Engineering controls - installing machine guarding.
- Administrative controls - applying a permit-to-work system or lock-out and tag-out procedures.
- PPE - provision and use of these equipment.
- SWP – Safe Work Procedures

Risk Control

- Using Hierarchy of Controls to reduce the risk
- Using the concept of As Low As Reasonably Practicable



PPE = Personal Protection Equipmen

Controls

Elimination	Substitution	Engineering	Administrative
1. Sub-out task to suitable party	1. Replace noisy m/c with a quiet m/c	1. Install fixed guard , auto guard, cover, limit switch, light curtain, etc.	1. Staff selection for the job
2. Chamfer sharp edges	2. Replace chemical x with safer Y	2. Redesign processes	2. LOTO
3. Remove spills, protrusions	3. Freon-based to Water-based	3. Cover extreme temp. surface with insulation	3. PTW for Hot-works, Working @ Height, Confined space entry, etc.
4. Purchase lower conc. chemical		4. Forklift Alert System	4. Procedures
		5. Cryogenic System Design	5. 4-E's
		6. Fire safety implementation	6. Segregated path for Forklift & Pedestrian

Controls

PPE			
Helmet, Bump-cap, Hair-net, etc.	S. Glasses, Goggles, S. Eyewear , Face-shield, Welding shield, etc	Ear-plugs, Muffs, Sound Attenuators	Full or Half face Respirators, Masks, Air-supplied, SCBA, etc.
Coverall, Tyvek Suit, Type A or B Chemical Suits, etc.	Gloves – Leather, Cloth, Canvas, Nitrile, Rubber, Metal-chain, Surgical	S. boots-Steal-toe , High, Anti-slip, Flood, Chemical resistant boots, etc.	One-way Airway, Face-shield Resuscitation Mask,
		Knee-pads, Elbow-pads, Wrist guards	Barrier creams, etc.

Education	Enforcement	Encouragement	Emergency Preparedness
1. TBM	1. Warning, Suspension, Dismiss	1. S. Campaign, AFD, Housekeeping	1. First Aiders, FA Box, FA Room
2. Course – BISH, BCSS, SC, RM, etc.	2. Standing Supervision	2. Quiz, Contest,	2. Fire-fighters,
3. Talks & Briefings	3. Deduct Safety Allowance	3. Signages, Posters	3. Hosereel, Extinguisher
4. Posters	4. BOI for Incident Investigation	4. S.I.Teams Competition	4. ERT, Rescuer, Stretcher
5. Computer-based Learning	5. Report to MoM, FSSD, NEA, etc.	5. Safety Rally	5. Emergency Shower & Eyewash

Reference

https://www.hastam.co.uk/are-you-taking-risks-with-risk-assessment/

https://www.iata.org/whatwedo/safety/Pages/safety-management.aspx