PRESENTATION ON :

ENVIRONMENTAL AWARENESS, IMPACT ASSESSMENT AND AUDITING

PRESENTATION BY

NAV ANUBHUTI WELFARE SOCIETY,
B-1/459, 1ST Floor Janakpuri, New
Delhi, Pin- 110058

PREPARED BY

H-22, Jungpura Extension, New Delhi-110014, India

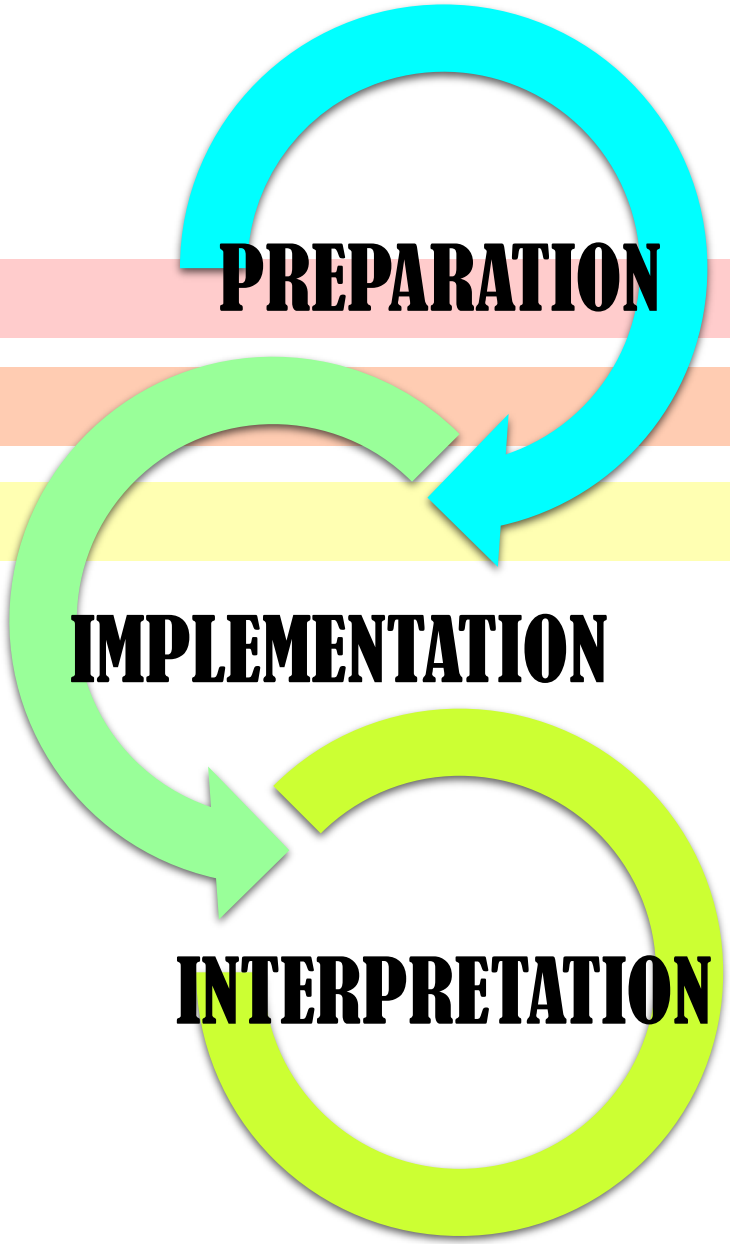

WORLD OZONE DAY
2021

INDEX

moef.gov.in/wp-content/uploads/2018/04/Introducation.pdf

An Environmental Risk Assessment (ERA) is a scientific process that identifies and evaluates the likelihood of a business or a developmental activity to threaten the environment, in particular to living organisms, natural habitats, and ecosystems.

It is the process of determining the probability and magnitude of harm to human life, welfare and environment, potentially caused by the release of hazardous chemical, physical or biological pollutants. Risk assessment provides a systematic procedure for predicting potential risks to human health or the environment. The aim of a chemical risk assessment is to investigate if a chemical is being used or can be used as intended without causing detrimental effects to human health or the environment.



The era procedure is triggered prior to a significant decision affecting the environment. It can be broken into three broad stages

- ✓ **Preparation** : involving collecting and examining relevant background information, and establishing the focus for the assessment.
- ✓ **Implementation** : Conducting the assessment.
- ✓ **Interpretation** : Interpreting, reporting and applying results of the assessment.

ERA is a support tool for policy evaluation, land use planning, and resource management decision making. It is systematic, and can be applied in a variety of situations, ranging from those with minimal available data and resources, to those with detailed inventories and complex systems modelling.

How much of a chemical is present

- in an environmental medium (e.g., soil, water, air)

How much contact (exposure)

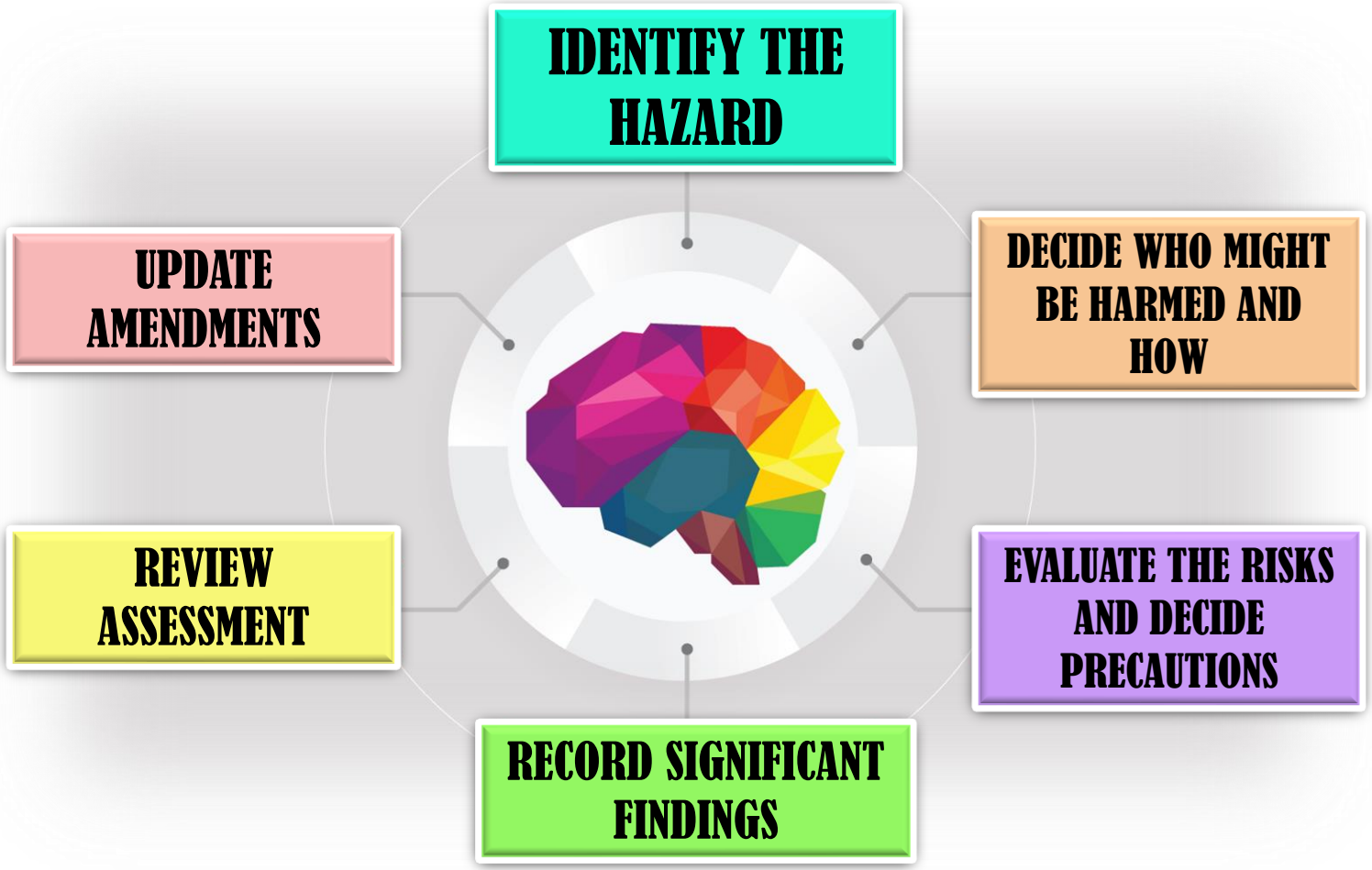
- A person or ecological receptor has with the contaminated environmental medium

Toxicity

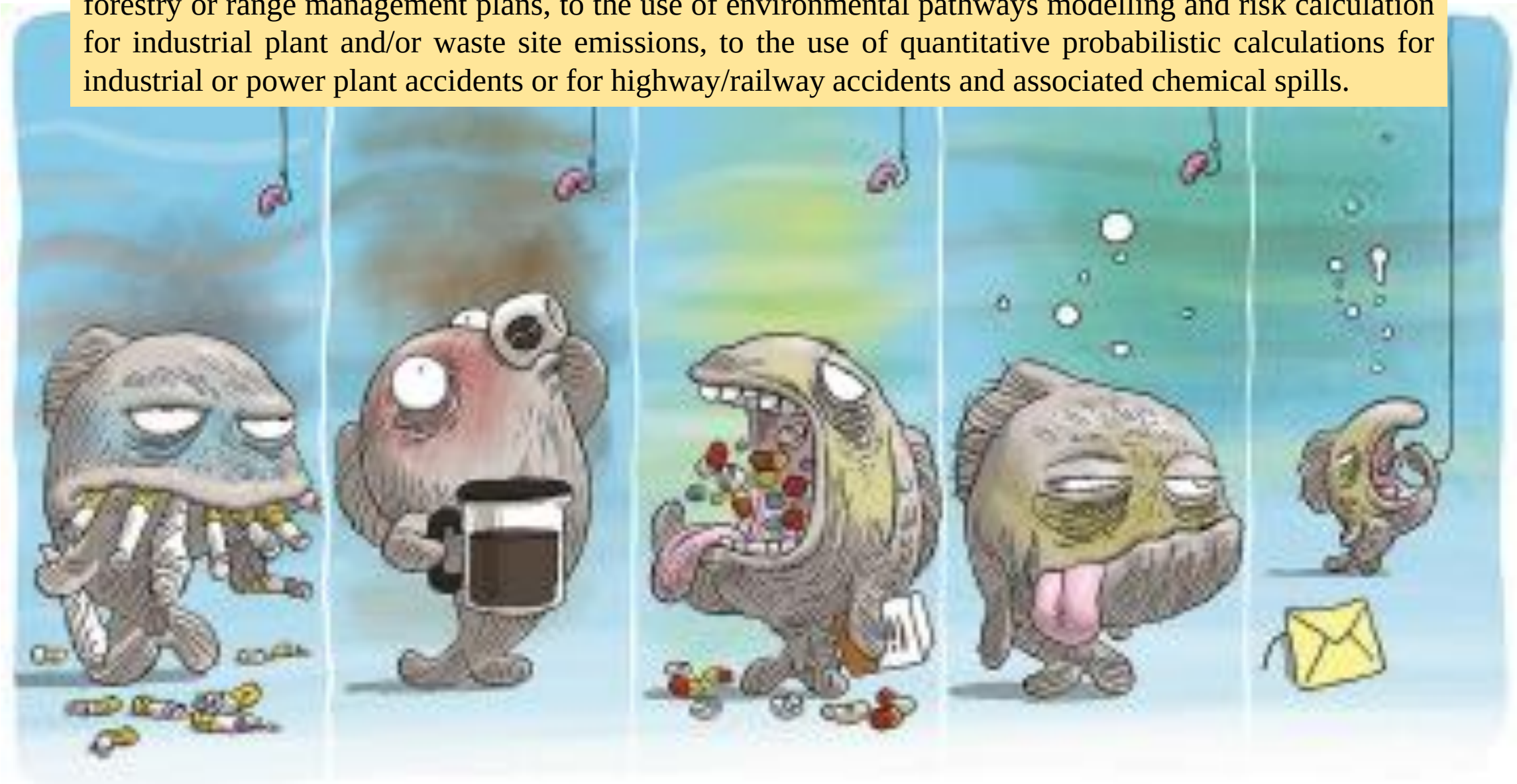
- The inherent toxicity of the chemical.

EPA uses risk assessments to characterize the nature and magnitude of health risks to humans (e.g., residents, workers, recreational visitors) and ecological receptors (e.g., birds, fish, wildlife) from chemical contaminants and other stressors, that may be present in the environment.

A health and safety risk assessment considers the hazards present in a task or activity. It looks at the likelihood of harm that might occur. And the severity of that harm. A risk assessment should take the following values:



It is timely to incorporate risk assessment tools in the EIA process. The possibilities range from the determination of relative risk indices for single issues such as the choice of pesticides or herbicides in forestry or range management plans, to the use of environmental pathways modelling and risk calculation for industrial plant and/or waste site emissions, to the use of quantitative probabilistic calculations for industrial or power plant accidents or for highway/railway accidents and associated chemical spills.



5- Step in Risk Assessment

- Hazard Identification
- Dose-Response Analysis
- Exposure Analysis
- Risk Characterization
- Risk Control

Hazard Identification

- Hazard identification :
  The process of determining whether exposure to an agent can increase the incidence of a health condition.

- It includes :

✓ Specification of exposure

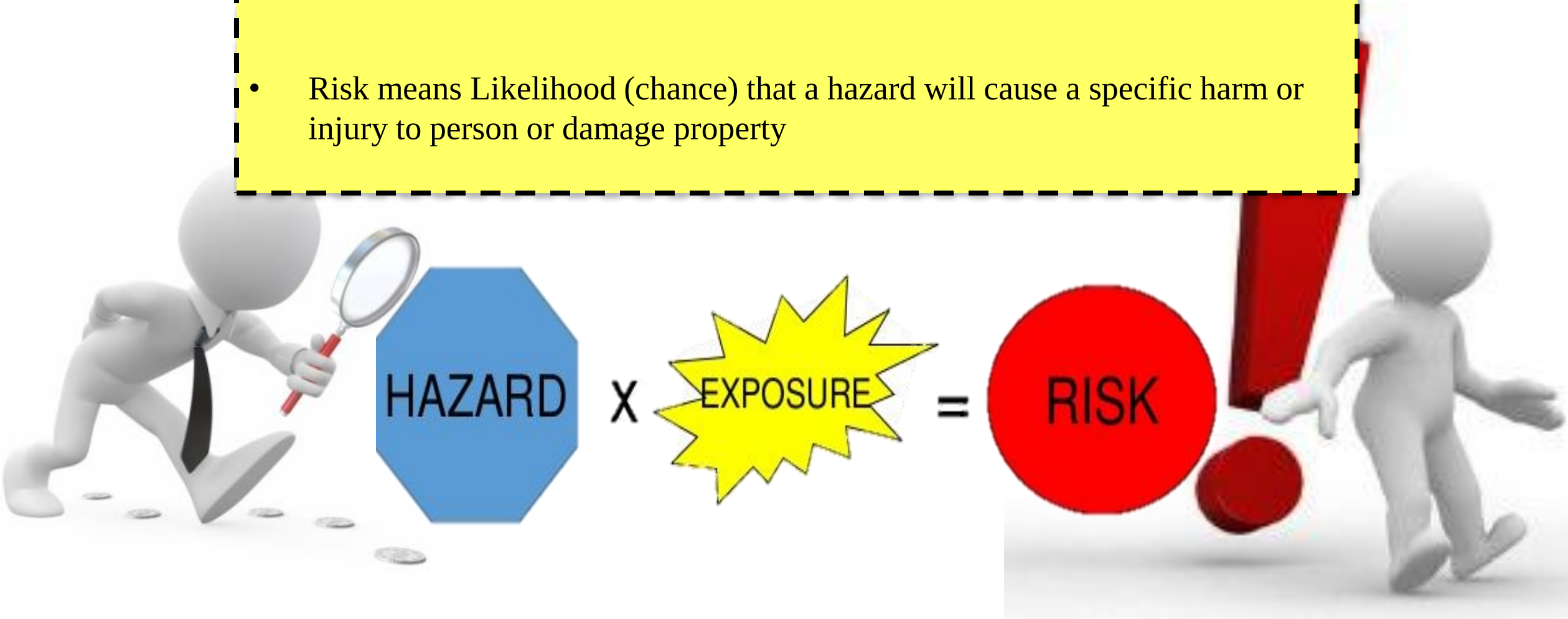
✓ Process of determining whether exposure to an agent Can cause an increase causality

Examples of Environmental Hazards that Cause Human Health Problems

- Pesticides/Herbicides
- Arsenic
- Lead
- Mold
- Carbon monoxide
- Asbestos
- Benzene
- Electromagnetic Fields
- Alcohol
- Radon
- Ozone
- Particulate Matter
- Tobacco
- Dioxins
- Noise Pollution

HAZARD AND RISK

- Hazard is anything with the potential to cause harm Hazard ≠ Risk
- Risk means Likelihood (chance) that a hazard will cause a specific harm or injury to person or damage property



HAZARD

Anything that can cause harm *(eg. a chemical, electricity, ladders, etc)*

RISK

How great the chance that someone will be harmed by the hazard

Dose-Response Analysis

Dose

- The amount of chemical entering the body
- This is usually given in mg of chemical/kg of body weight = mg/kg

The dose is dependent on :

1. The environmental concentration
2. The properties of toxicant
3. The length of exposure
4. The frequency of exposure
5. The exposure pathway

Response

- The degree and spectra of responses depend upon the dose and the organism

Which is based on exposure condition with description of dose

1. Change from normal state

Could be on the molecular, cellular, organ or organism level

1. Local v/s systemic
2. Reversible v/s irreversible
3. Immediate v/s Delayed
4. Graded v/s Quantalv

Threshold effects

Threshold is a level below which no effect occurs and above which effects begin to occur.

– If a threshold exists, then a concentration below the threshold is safe.

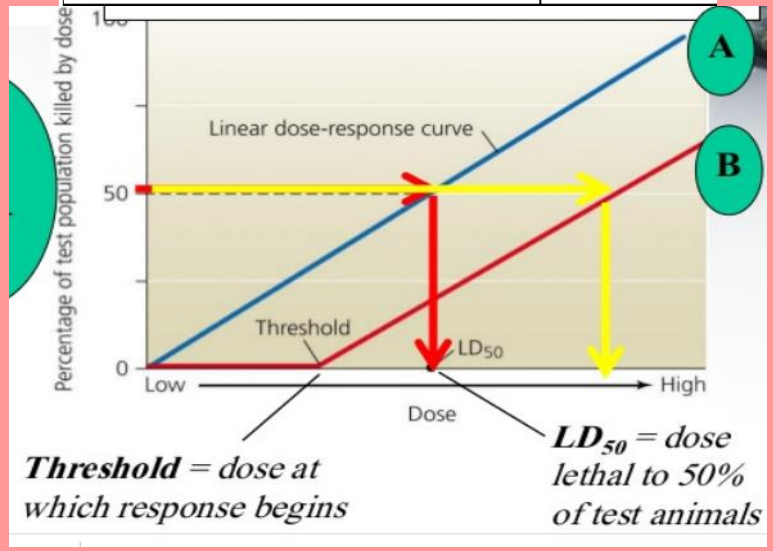
– If there is no threshold dose, then even the smallest amount has some negative toxic effect

LD_{50}

Quantal responses can be treated as gradient when a data from a population is used

- If mortality is the response, the Dose that is lethal 50% of the population LD_{50} can be generated from the curve
- Different toxicants can be compared –lowest dose is most potent

Chemical	LD_{50} (mg/kg)
Ethyl Alcohol	10,000
Sodium Chloride	4,000
Ferrous Sulfate	1,500
Morphine Sulfate	900
Strychnine Sulfate	150
Nicotine	1
Black Widow	0.55
Curare	0.50
Rattle Snake	0.24
Dioxin (TCDD)	0.001
Botulinum toxin	0.0001

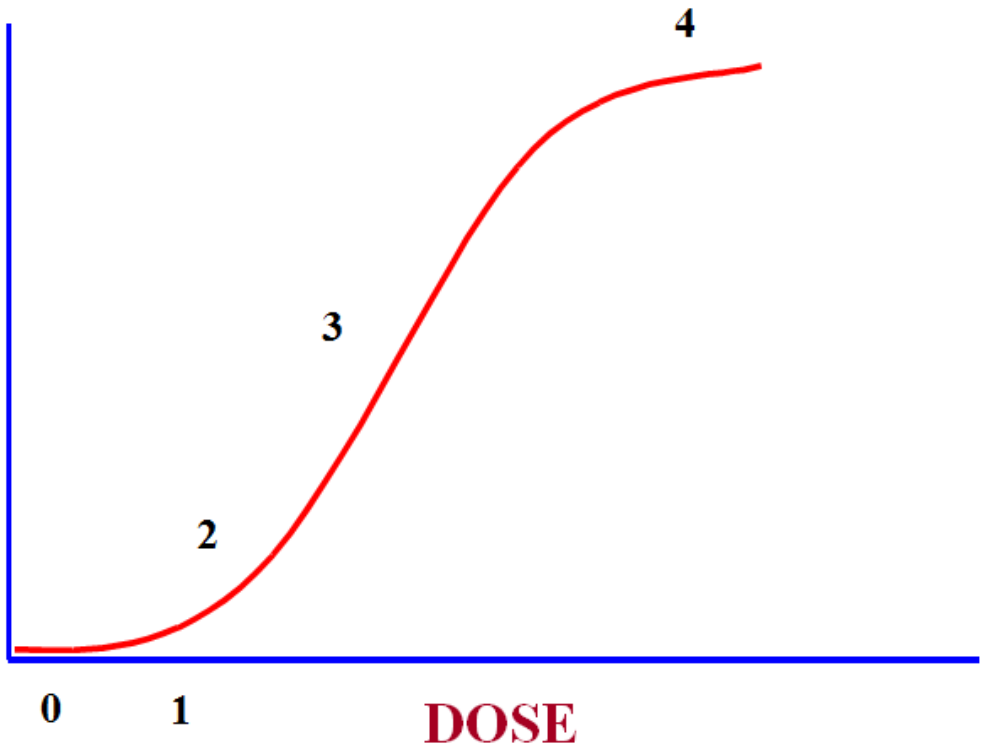


Dose-Response Relationship

As the dose of toxicant increases, so does the response

RESPONSE

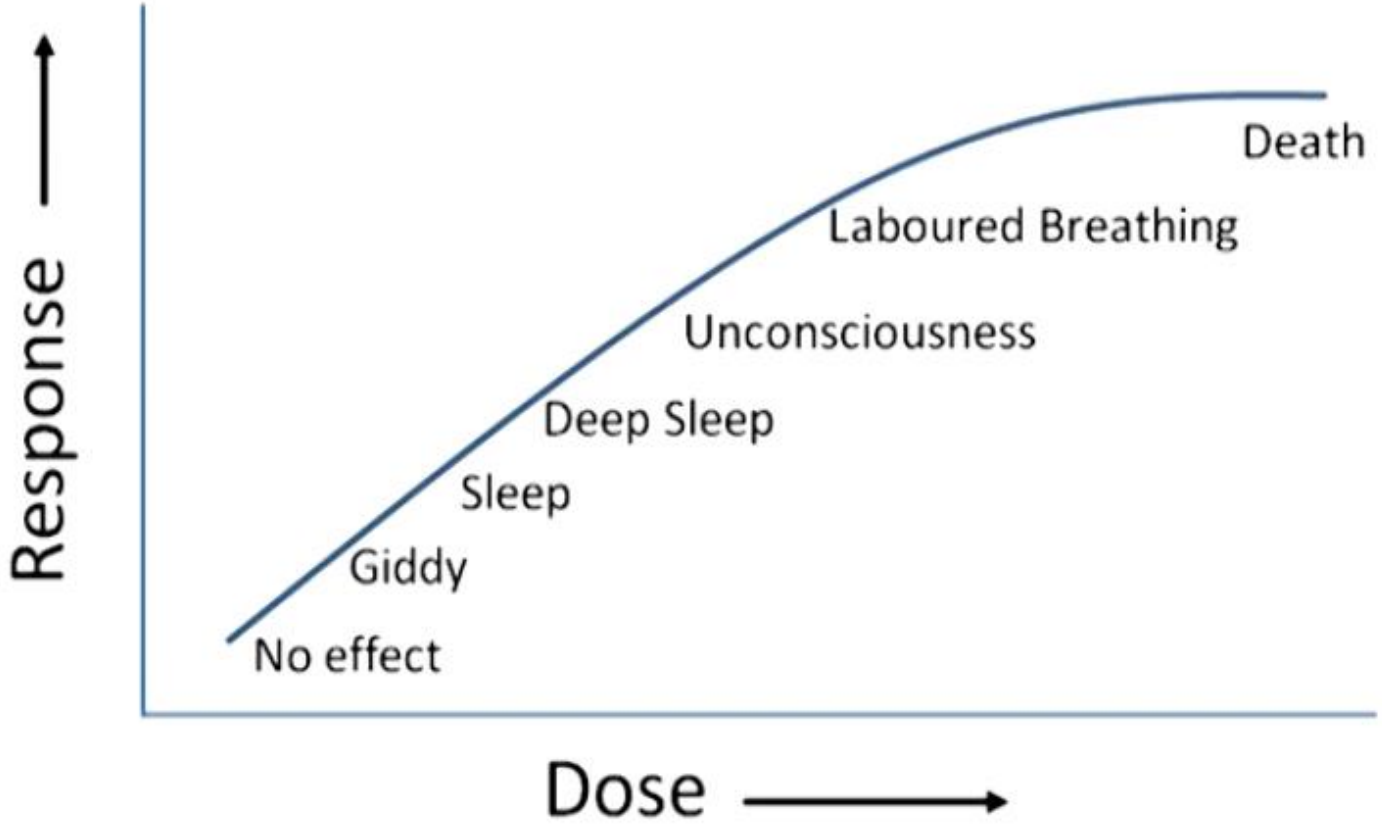
0-1 NOAEL (No-observed- adverse- effect level)
2-3 Linear Range
4 Maximum Response



DOSE DETERMINES THE BIOLOGICAL RESPONSE

Dose-Response Relationship

Correlation between the amount of exposure and the resulting effect



Exposure Analysis

Environmental exposure

- Any contact between a potentially harmful agent present in the medium, and a surface of the human body

- 3 parts of exposure:

1. The source
2. Environmental Pathway
3. The route

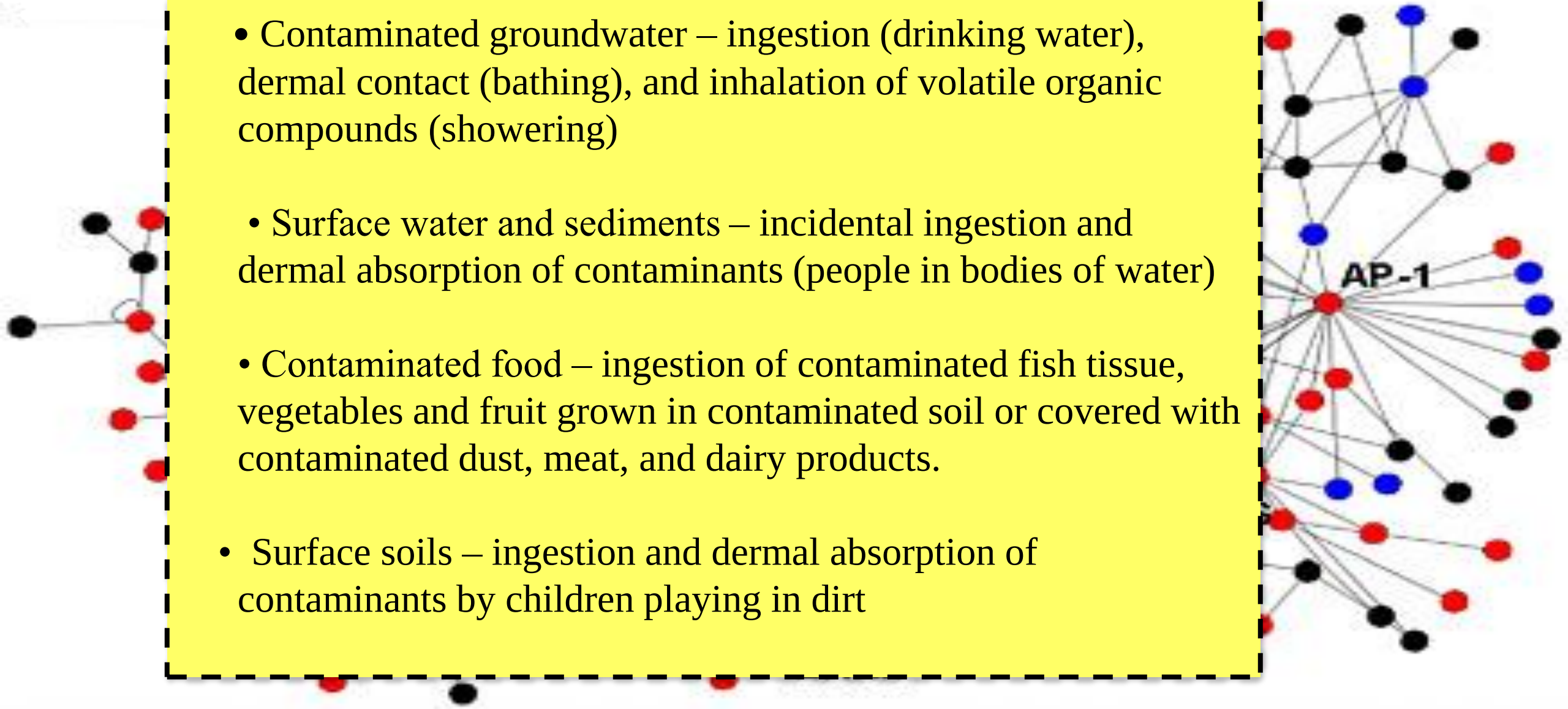
Environmental Pathway

- Contaminated groundwater – ingestion (drinking water), dermal contact (bathing), and inhalation of volatile organic compounds (showering)

- Surface water and sediments – incidental ingestion and dermal absorption of contaminants (people in bodies of water)

- Contaminated food – ingestion of contaminated fish tissue, vegetables and fruit grown in contaminated soil or covered with contaminated dust, meat, and dairy products.

- Surface soils – ingestion and dermal absorption of contaminants by children playing in dirt

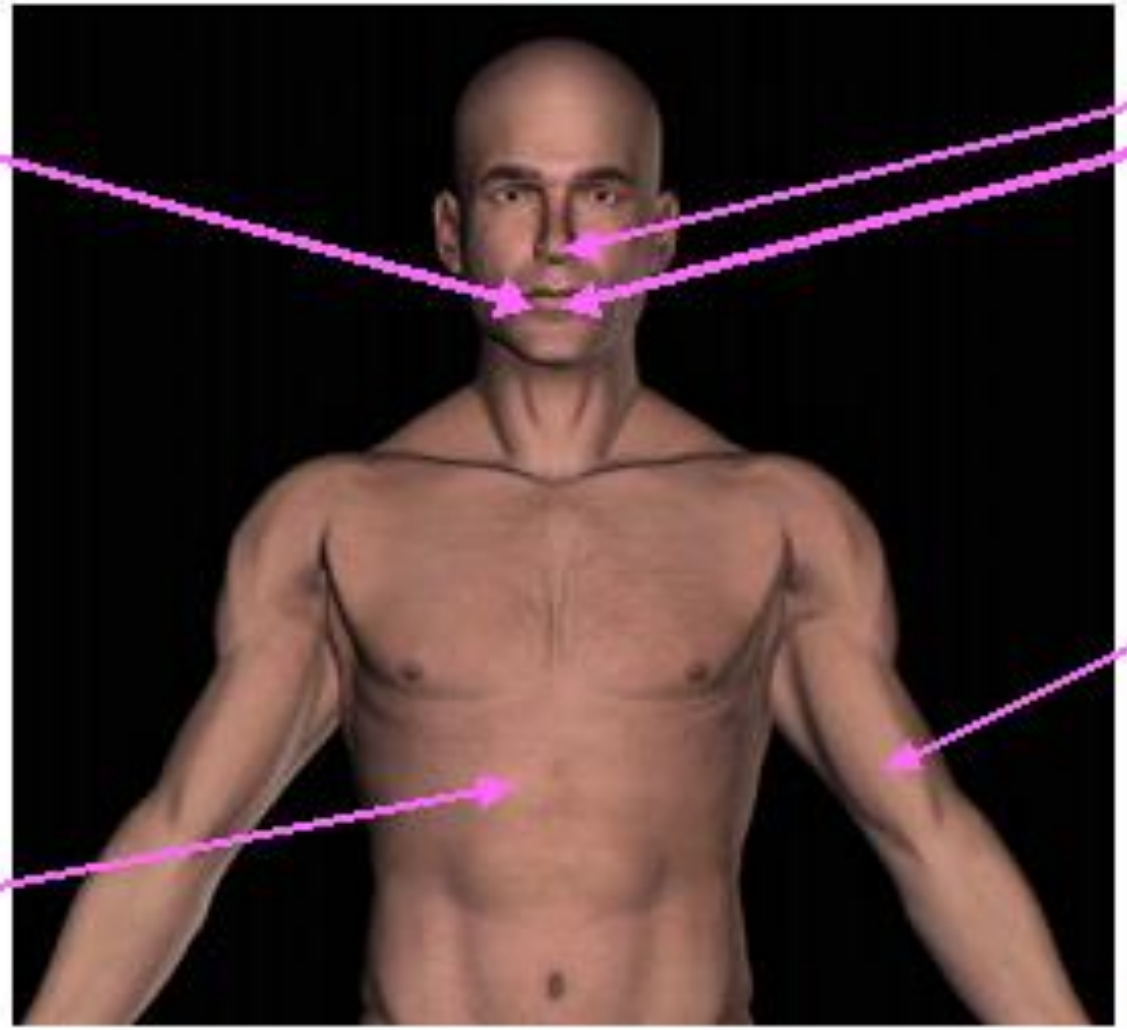


- Fugitive dust and VOC emissions – inhalation by nearby residents or onsite workers

- Subsurface soil and air-borne contaminants – future land-use conditions during construction activities

- Contaminated breast milk – nursing infants whose mothers were exposed to highly toxic lipophilic contaminants Identification of Exposure Pathways

Routes and Sites of Exposure



- ✓ Ingestion (Gastrointestinal Tract)
- ✓ Inhalation (Lungs)
- ✓ Injection (Intravenous, Intramuscular, Intraperitoneal)
- ✓ Dermal/Toxic (Skin)

Risk Characterization

- Risk characterization
  Describe the nature and magnitude of risk
- To decide whether the risk from a hazard is significant or not
- Would it be likely to result in serious or moderate consequence
- Example: Would it result to death, a fracture or just a minor cut to finger
  .

- **Risk Categories**

  Assessment and categorization is done on Base risk level for each identified hazards considering their Probability (P) and Severity(S) as mentioned in the following table.

Probability (P)	Score	Indicative Guidelines (Frequency of last occurrence)
Almost Certain	5	Daily
Quite Possible	4	Weekly
Unusual but Possible	3	Monthly
Unlikely	2	Yearly
Very unlikely	1	> one year

Human Severity (S)	Asset Damage and other Consequential Business Loss (S)	Environmental Effect (S)	Impact on Reputation (S)	Score
Multiple Fatality	Massive damage: Costs in excess of Fifty crore Rupees	Massive damage: loss of natural resources over a wide area.	Massive impact: International public concern	**5**
Fatality	Major damage: Costs between Five crore and Fifty crore Rupees	Major damage: Exceeds prescribed limits, with potential long term effects	Major impact : National public concern	**4**

Human Severity (S)	Asset Damage and other Consequential Business Loss (S)	Environmental Effect (S)	Impact on Reputation (S)	Score
Serious Injury	Moderate damage: Costs between fifty Lakh and Five crore Rupees	Moderate damage: Contamination Damages	Moderate impact: Significant impact in region	**3**
Minor Injury	Minor damage: Costs between 500000 to fifty Lakh Rupees	Minor damage: No permanent effect on environment	Minor impact: Local public concern Local media coverage	**2**

Human Severity (S)	Asset Damage and other Consequential Business Loss (S)	Environmental Effect (S)	Impact on Reputation (S)	Score
First Aid	Slight damage: Costs less than 5, 00,000 Rupees	Slight damage: contained within the premises	Slight impact: Local public awareness but no discernible concern No media coverage	**1**

Calculate **Risk Score (R)** of each hazards as :

Risk Score = Probability x Score

$R = P \times S$

Evaluate the Base Risk Level from the risk score as per the following Table

Score	Risk Level
1 to 4	Acceptable (A)
5 to 7	Moderate (M)
8 to 9	Substantial (S)
10 and above	Unacceptable (U)

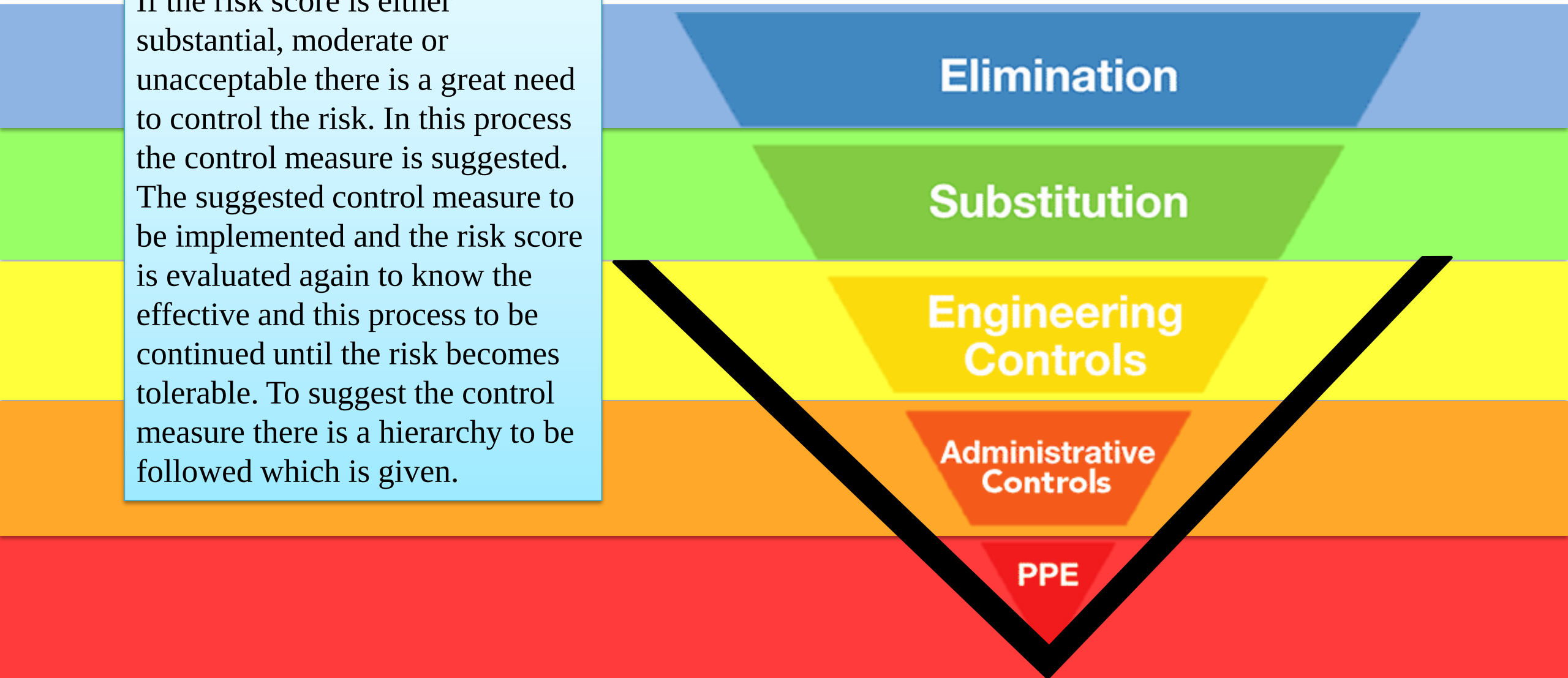
	Consequence				Likelihood				
Severity	People	Assets	Environment	Reputation	1	2	3	4	5
					Very unlikely	Unlikely	Unusual but Possible	Quite Possible	Almost Certain
1	First Aid	Slight Damage	Slight effect	Slight Impact					
2	Minor Injury	Minor Damage	Minor effect	Minor Impact		LOW	RISK		
3	Serious Injury	Moderate Damage	Moderate effect	Moderate Impact			MEDIUM	RISK	
4	Fatality	Major Damage	Major effect	Major Impact				HIGH	RISK
5	Multiple fatality	Massive Damage	Massive effect	Massive Impact					

https://hseindia.wordpress.com/tag/hirac/#:~:text=The%20process%20is%20known%20as,available%20safeguards%20

MAJOR INCIDENTS	• **Personnel**: Fatality or permanently disabling injury • **Community**: One or more severe injuries • **Environmental**: Event having serious on-site or off-site impact, results in off-site agency involvement and a major fine, serious negative public health or financial impacts, major local negative media coverage, international negative media coverage. • **Facility**: Major or total destruction to process area(s)
SIGNIFICANT INCIDENTS	• **Personnel:** One or more severe injury • **Community:** One or more minor injuries • **Environmental:** Event having significant on-site or off-site impact and requiring prompt agency and corporate notification, serious negative public impact or perception, significant local negative media coverage, a fine is likely. • **Facility:** Major damage to process area(s)
MINOR INCIDENTS	• **Personnel**: Single injury, not severe, possible lost time. • **Community**: Odour or noise complaint from public • **Environmental**: Event results in agency reporting or consent violation, minor negative public impact or perception, little or no local media coverage, a fine is not likely • **Facility**: Some equipment damage
INCIDENTAL INCIDENTS	• **Personnel**: Minor or no injury, no lost time • **Community**: No hazard to public, no public complaint • **Environmental**: Environmental event with no agency involvement or consent violation, no negative public impact or perception. • **Facility**: Minimal equipment damage

RISK CONTROL

If the risk score is either substantial, moderate or unacceptable there is a great need to control the risk. In this process the control measure is suggested. The suggested control measure to be implemented and the risk score is evaluated again to know the effective and this process to be continued until the risk becomes tolerable. To suggest the control measure there is a hierarchy to be followed which is given.



Elimination of hazard: examples include the proper disposal of redundant items of equipment that contain substances such as asbestos or PCBs.

Substitution of hazard: examples include the replacement of solvent-based printing inks with water-based ones, the use of titanium dioxide white pigment instead of lead white, etc.

Engineering controls: examples include the installation of machine guards on hazardous equipment, the provision of local exhaust ventilation over a process area releasing noxious fumes, fitting a muffler on a noisy exhaust pipe, etc.

Administrative controls: include training and education, job rotation to share the load created by demanding tasks, planning, scheduling certain jobs outside normal working hours to reduce general exposure. Early reporting of signs and symptoms, instructions and warnings, etc.

Personal protective equipment (PPE): includes safety glasses and goggles, earmuffs and earplugs, hard hats, toe-capped footwear, gloves, respiratory protection, aprons, etc

RISK ANALYSIS

Environmental risk analysis identifies environmental risks; assesses their probability (likelihood) and consequences; identifies acceptable levels of risk; creates scenarios; and determines and communicates what actions should be taken to remove or reduce the risks.

Affecting people, the environment, and possessions, risks can either be qualitative or quantitative.

Environment risk analysis attempts to reduce and manage environmental risks associated with an activity or situation.

Environmental risk analysis can be broken into various components:

- Hazard identification - what are the hazards.
- Risk assessment - what are the likelihood (occurrence rate) and consequences (adverse impacts) of the risks. What actions exacerbate or reduce the likelihood.
- Risk evaluation - are the risks high, medium or low (what is the severity or magnitude); which risks have priority.
- Risk management - what level of risk is considered acceptable? Are the risks acceptable (tolerable)? If not, how will the risk be removed or reduced and managed.
- Risk communication - how will the risks and management options be communicated and to whom will they be communicated.
- Monitoring and feedback - assesses the success of implemented solutions; feeds results back into the decision making process.

For the project to be crystal clear, Quantitative and qualitative analysis are conducted. To give a detailed structure of Risk Assessment Analysis additional studies are carried out, which include :

- **DISASTER MANAGEMENT PLAN (DMP)**
- **MAXIMUM CREDIBLE ANALYSIS (MCA)**
- **HAZARD AND OPERABILITY STUDY (HAZOP)**

DISASTER MANAGEMENT PLAN

Disaster Management is the creation of the plans or through which communities reduce vulnerability to hazards & cope with disaster. Disaster Management Plan is prepared from guidelines received from Disaster management cell under respective municipal corporation which will be helpful to residents in case of disasters. It shall advice role players how to lead in case of disaster to prevent or to at least mitigate negative impacts and same shall be updated based on practical experience and /or actual site requirements.

Objectives of DMP

The main objectives of an On-Site Emergency Plan are:

- To define, and assess emergencies, including risk and environment impact.
- To safeguard employees & people in vicinity and restore normalcy soon.
- To minimize damage to property or/and the Environment
- To inform authorities and the mutual aid centres for help if need arises.
- For planning effective rescue and treatment of injured and affected.
- To ensure safety of the workers before personnel re-enter and resume work.
- To work out plan with all provisions to handle emergencies and to provide for emergency preparedness and the periodical rehearsals of the plan.

The On-Site Emergency Plan

- Has therefore to be related to the identification of sources from which hazards can arise and the maximum credible loss scenario that can take place in the concerned area.

- Secure ceiling lights, suspended ceilings etc.
- Being aware of the seismic Zone
- Keeping corners clear.

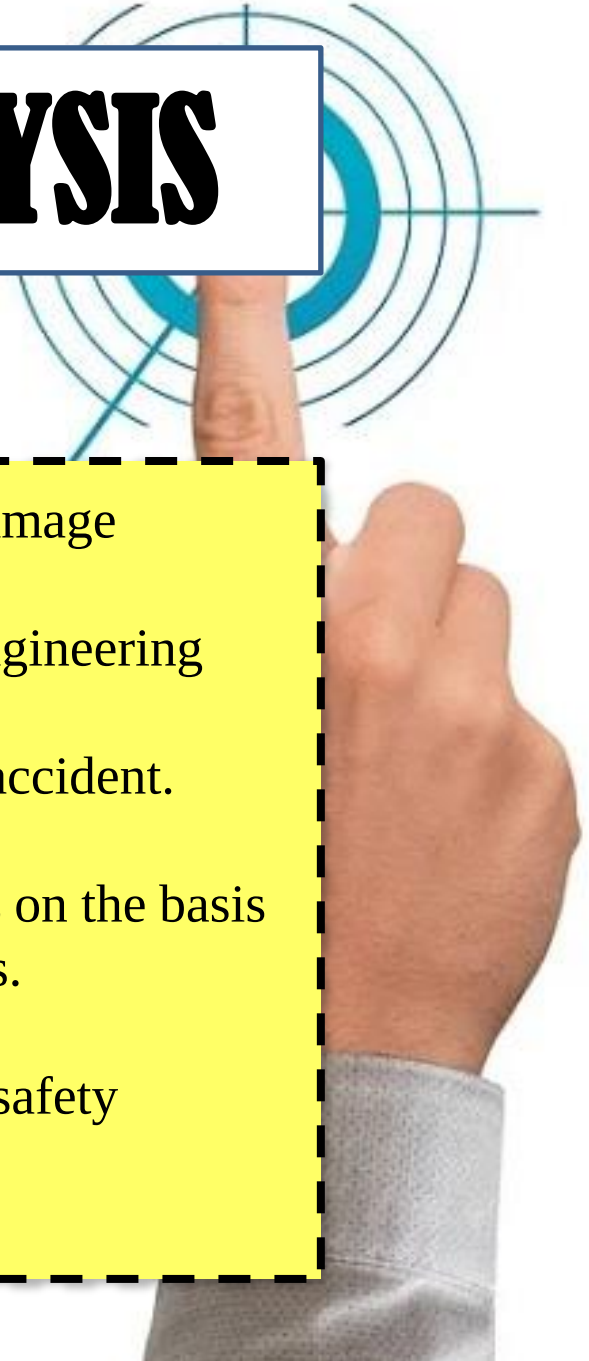
- Auditing of the building
- Damages reported to chairman
- Everyone attains mock drills

- Providing relief packages
- Insuring health of workers
- Giving emotional, mental support to workers

- <u>Rescue equipments</u> torch, rope , knife
- First aid kid
- Numbers of nearby hospital
- Warning system

- Check if anyone else is hurt. Use first aid at least on the cuts and bruises
- Keep the streets clear for emergency services
- Switch off all appliances like the refrigerator, TV or Computers . Turn off the gas

MAXIMUM CREDIBLE ANALYSIS



Maximum Credible Accident (MCA) is a probable accident with maximum damage distance.
The selection of accident scenarios for MCAA is carried out on the basis of engineering judgement and past accident analysis.
MCAA does not include quantification of the probability of occurrence of an accident.

Eg. Accidental release of oil and gas has to be studied by visualising scenarios on the basis of their properties and the impacts are computed in terms of damage distances.

MCA methodology is used to identify the events of highest importance in the safety analysis.

MAXIMUM CREDIBLE ACCIDENT (MCA) ANALYSIS

Probable accident with maximum damage distance

DATA REQUIREMENT

- Operation Procedures
- Detailed design parameters
- Physical & chemical properties data
- Detailed information about facility
- Past accident data

Steps in MCA Analysis

PAST ACCIDENT DATA ANALYSIS

- *Past accident database generation*
- *Analysis of created database*

HAZARD IDENTIFICATION

- *Hazard identification in terms of safety and environmental impact*
- *Identification of representative failure cases for the wells and various equipments*

CONSEQUENCE ANALYSIS

- *Damage distance computations for the released cases*
- *Identification of release scenario*
- *Calculation of damage distances for various Heat Loads*

EMERGENCY PLANNING

Human Injury		Structural Damage	
Peak Over Pressure - bar	**Type of Damage**	**Peak Over Pressure- bar**	**Type of Damage**
5 - 8	100% lethality	0.3	Heavy (90% damage)
3.5 - 5	50% lethality	0.1	Repairable (10% damage)
2 - 3	Threshold lethality	0.03	Damage of Glass
1.33 - 2	Severe lung damage	0.01	Crack of Windows
1 - $1^{1/3}$	50% Eardrum rupture	-	-

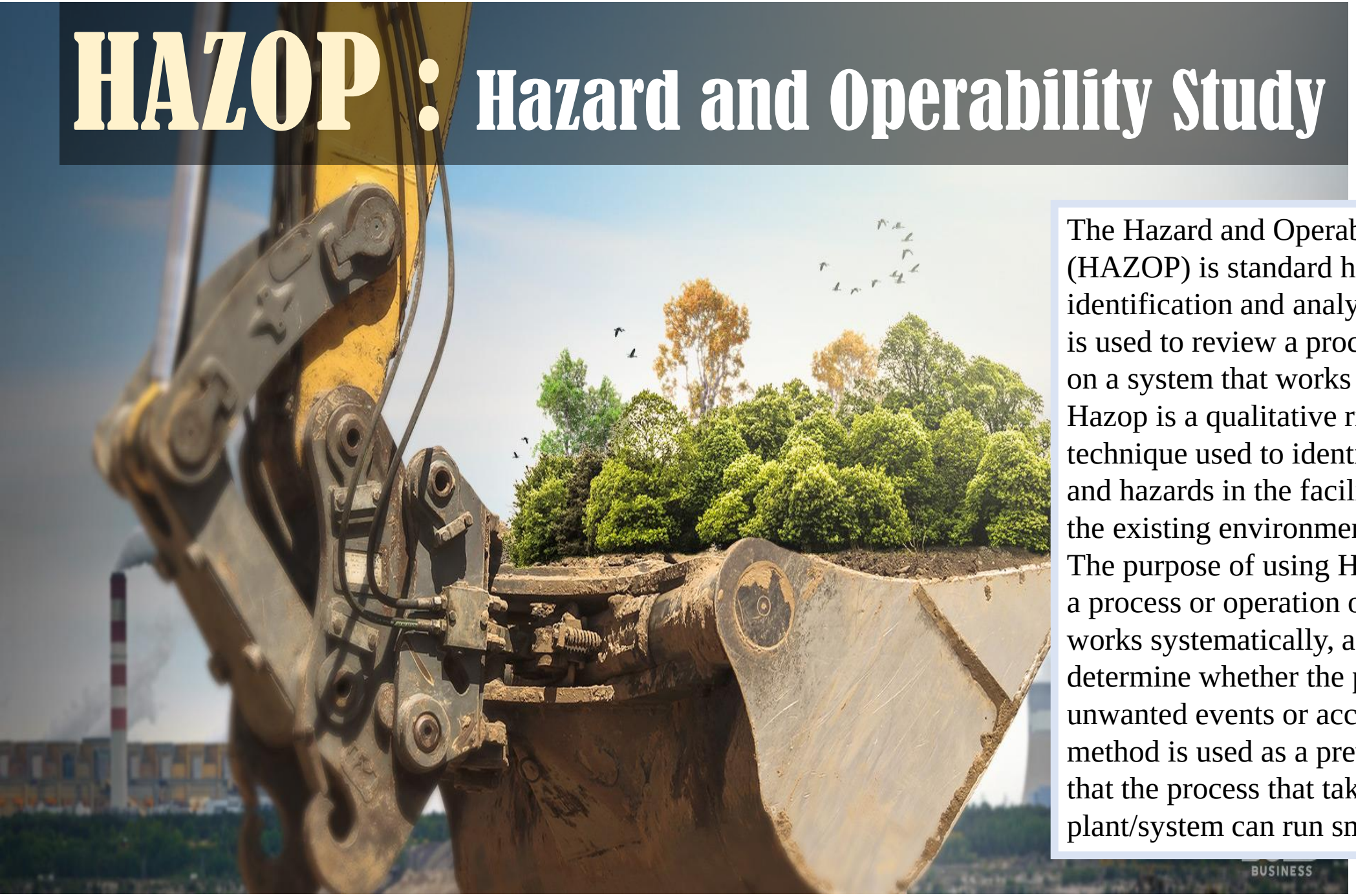
Source: Marshall, V.C. (1977) 'How lethal are explosives and toxic escapes'

TABLE-7.5
DAMAGE DUE TO INCIDENT RADIATION INTENSITIES

Sr. No.	Incident Radiation (kW/m^2)	Type of Damage Intensity	
		Damage to Equipment	**Damage to People**
1	37.5	Damage to process equipment	100% lethality in 1 min. 1% lethality in 10 sec.
2	25.0	Minimum energy required to ignite wood at indefinitely long exposure without a flame	50% Lethality in 1 min. Significant injury in 10 sec.
3	19.0	Maximum thermal radiation intensity allowed on thermally unprotected adjoining equipment	--
4	12.5	Minimum energy to ignite with a flame; melts plastic tubing	1% lethality in 1 min.
5	4.5	--	Causes pain if duration is longer than 20 sec, however blistering is un-likely (First degree burns)
6	1.6	--	Causes no discomfort on long exposures

Source: Techniques for Assessing Industrial Hazards by World Bank

HAZOP : Hazard and Operability Study



The Hazard and Operability Study (HAZOP) is standard hazard identification and analysis technique that is used to review a process or operation on a system that works systematically. Hazop is a qualitative risk analysis technique used to identify weaknesses and hazards in the facility/plant process in the existing environment or system.
The purpose of using Hazop is to review a process or operation of a system that works systematically, as well as to determine whether the process can lead to unwanted events or accidents. This method is used as a prevention effort so that the process that takes place in a plant/system can run smoothly and safely.

Characteristics of HAZOP :

Systematic, namely using a high structure or arrangement by relying on guide words and the idea of the team to continue and ensure the safe guards match or not with the place and object being tested.

Specialization of forms by various kinds of disciplines owned by team members.

Can be used for various systems or procedures. Its use is more as a system of cultural interpretation techniques.

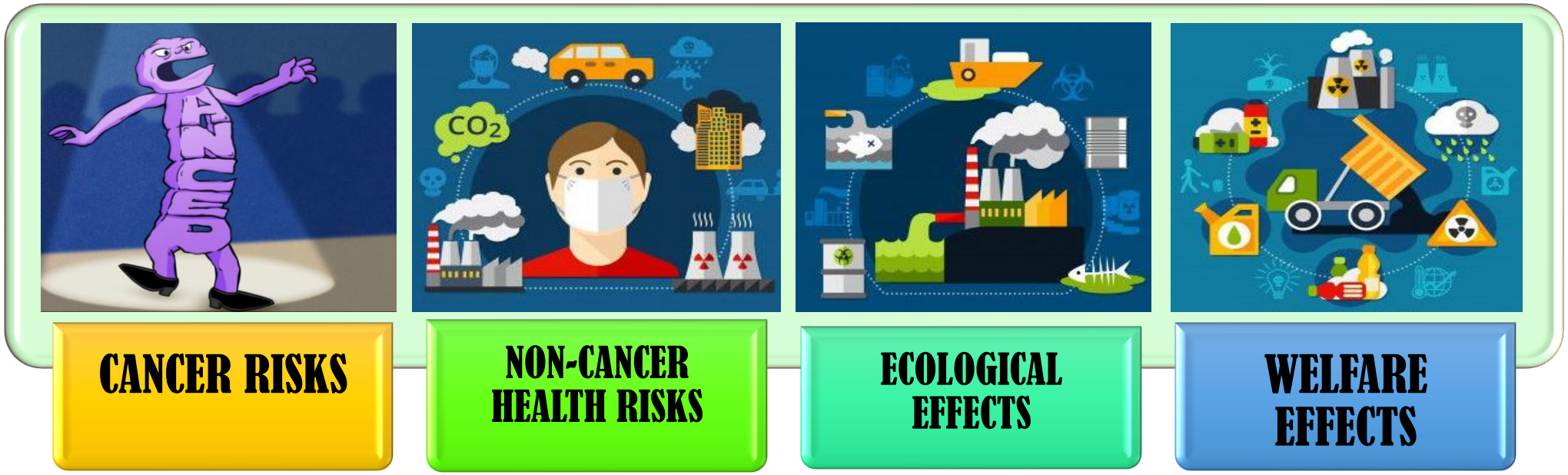
Initial estimates, so as to be able to produce good quality even though quantity is also influential.

Advantages of HAZOP :

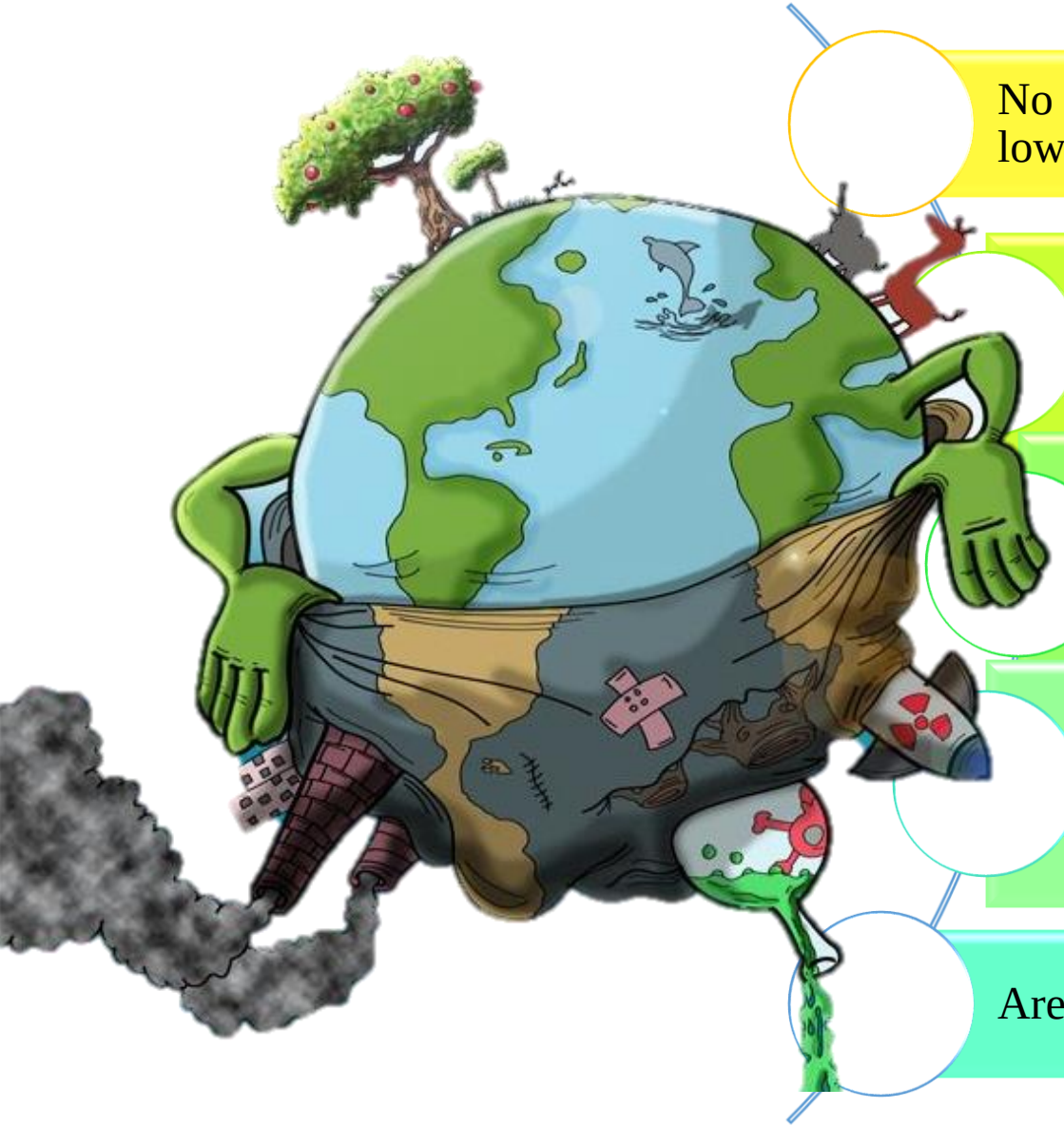
- Hazard analysis techniques are arranged systematically, comprehensively and flexibly both before a system is in production, can also identify modifications to existing equipment to reduce risk problems and operations.
- Hazop can identify exactly what critical deviations occur and their causes.
- Not only focus on safety, but also identify hazards (prevent accidents) and operability (running a smooth process so as to increase plant performance).
- It is suitable to be done in groups involving experts from multi disciplines and led by experienced work safety specialists or special consultants.

COMPARATIVE RISK ANALYSIS

A comparative assessment of environmental problems discuss the concepts of risk assessment as applied to a variety of pressing environmental problems. The goal of the study was to attempt to use risk as a policy tool for raking major environmental problems in order to help concerned agencies establish broad, long-term priorities. The study was organised around a list of 31 environmental problems including topics as diverse as conventional (criteria) air pollutants, indoor radon, stratospheric ozone depletion, global warming, active (RCRA) and inactive hazardous waste sites, damage to wetlands, mining wastes, and pesticide residues on foods. Each of these 31 problems was analyzed by 4 separate working groups from the perspective of 4 different types of risks :



A perusal of the rankings of the 31 problem areas for each of the four types of risks produced the following general results:

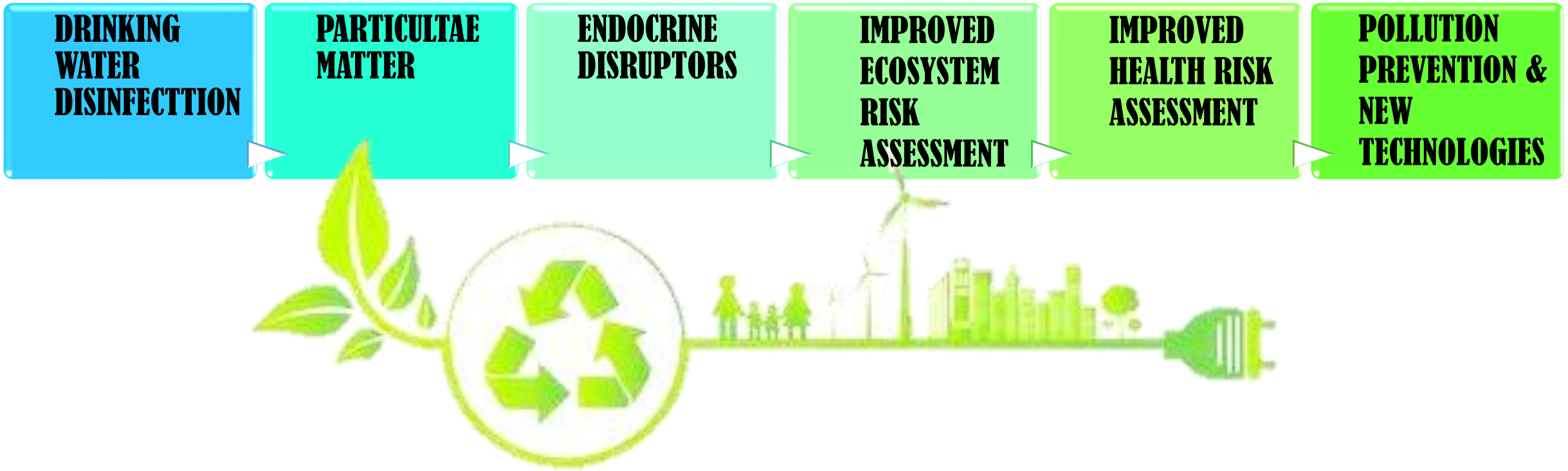


- No problems rank relatively high in all four risk types, or relatively low in all four.
- Problems that rank relatively high in three or four risk types, or atleast medium in all four, include criteria air pollutants, stratospheric ozone depletion, pesticide residue on food etc.
- Problems that rank relatively high in cancer and noncancer health risks, but low in ecological and welfare risks include hazardous air pollutants, indoor radon, pesticide application etc.
- Problems that rank relatively high in ecological and welfare risks, but low in both heath risks include global warming, point non-point sources, surface water pollution, mining wastes etc.
- Areas related to groundwater consistently rank medium or low.

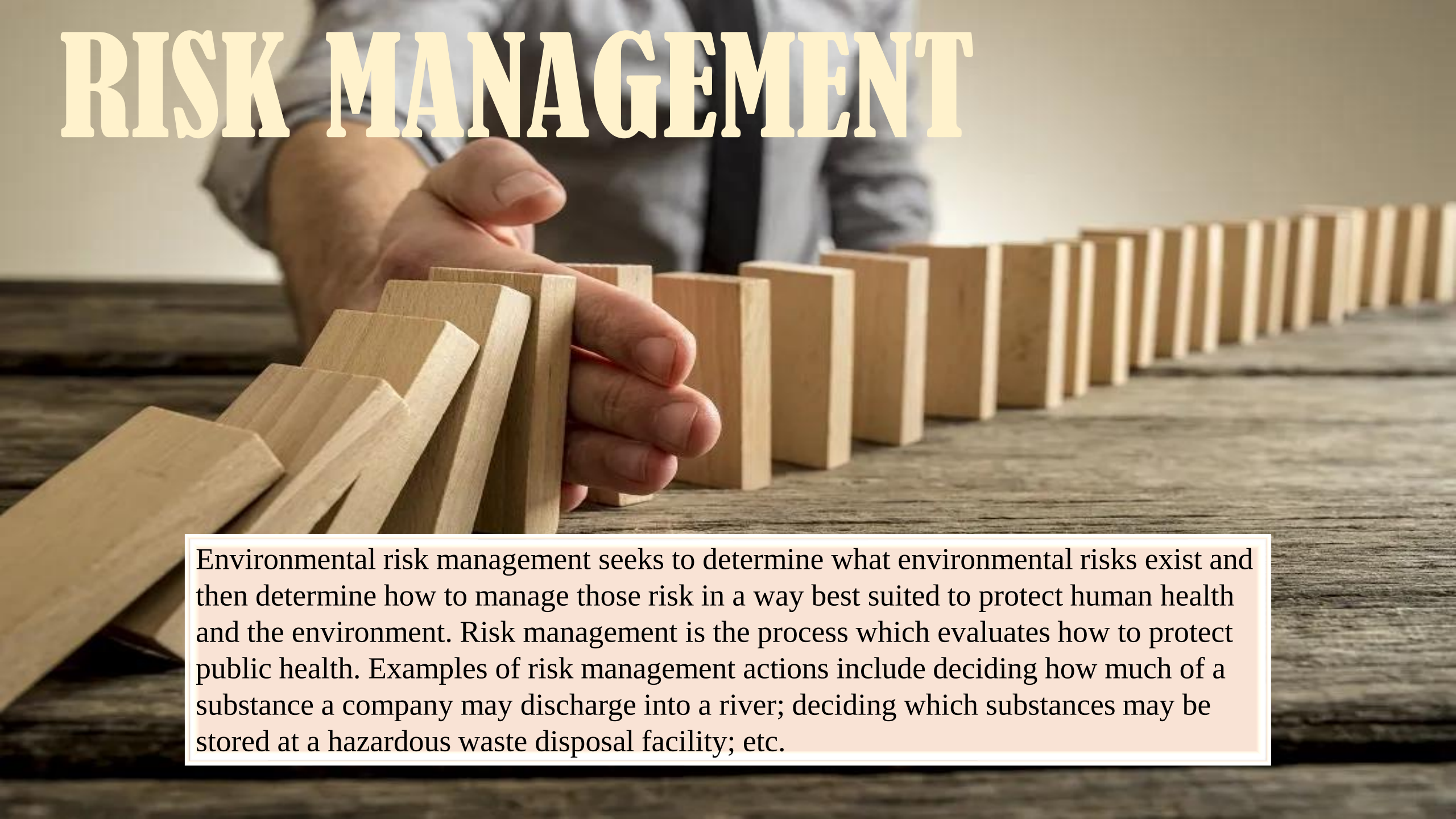
Comparative risk analysis differs from conventional risk assessment because its purpose is not to establish absolute values of risk but rather to provide a process for ranking of environmental problems by their seriousness. The comparative risk analysis shifted its focus to :

- ✓ Research and development on the greatest risks to people and the environment, taking into account their potential severity, magnitude and uncertainty.
- ✓ Research on reducing uncertainty in risk assessment and on cost-effective approaches for preventing and managing risks.
- ✓ Balance human health and ecological research.

Based on these strategic principles highest priority research topics are set like:



RISK MANAGEMENT



Environmental risk management seeks to determine what environmental risks exist and then determine how to manage those risk in a way best suited to protect human health and the environment. Risk management is the process which evaluates how to protect public health. Examples of risk management actions include deciding how much of a substance a company may discharge into a river; deciding which substances may be stored at a hazardous waste disposal facility; etc.

Components of Risk Management

The relative risk assessment chart uses three risk components:

Each of these components is assessed independently. Then, the three outputs are evaluated in a final step that provides the relative risk for the fire. Each risk component is defined by three variables. One variable is located on the right and one on the left side of the box and the third variable is defined by three interior lines extending from top to bottom.

Values

Values are those ecologic, social, and economic resources that could be lost or damaged because of a fire.

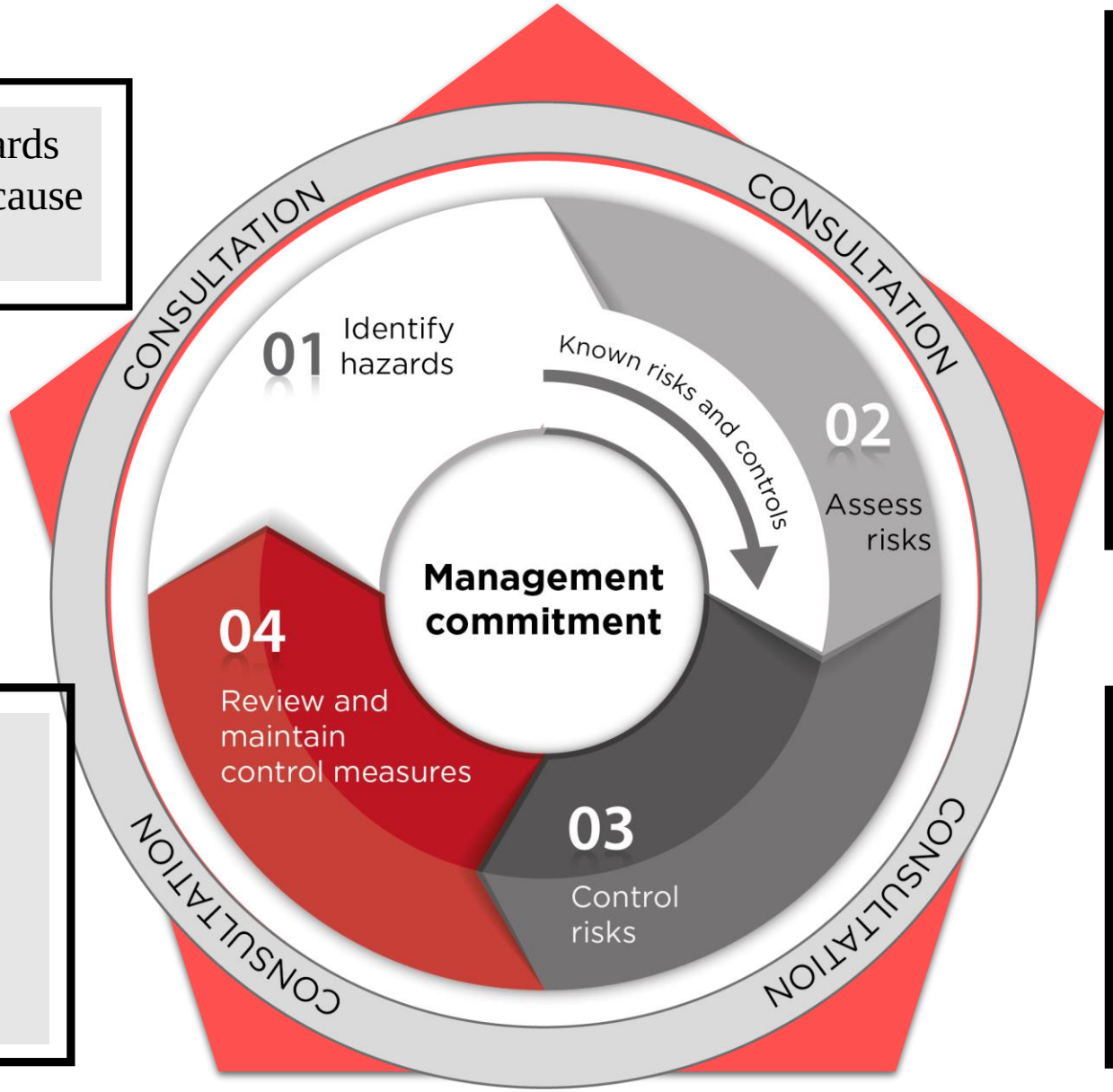
Ecologic values

Risk Management involves :

- Systematically applying policies, procedures and practices to hazard.
- Identification
- The consequences of those hazards
- Estimating risk levels (quantitatively or qualitatively)
- Assessing those levels of risk against relevant criteria and objectives
- Making decisions about, and minimizing the identified risks

Steps to Risk Management

Step 1 - Identify hazards
Find out what could cause harm.



Step 2 - Assess risks
If necessary – understand the nature of the harm that could be caused by the hazard, how serious the harm could be and the likelihood of it happening. This step may not be necessary if you are dealing with a known risk, with known controls.

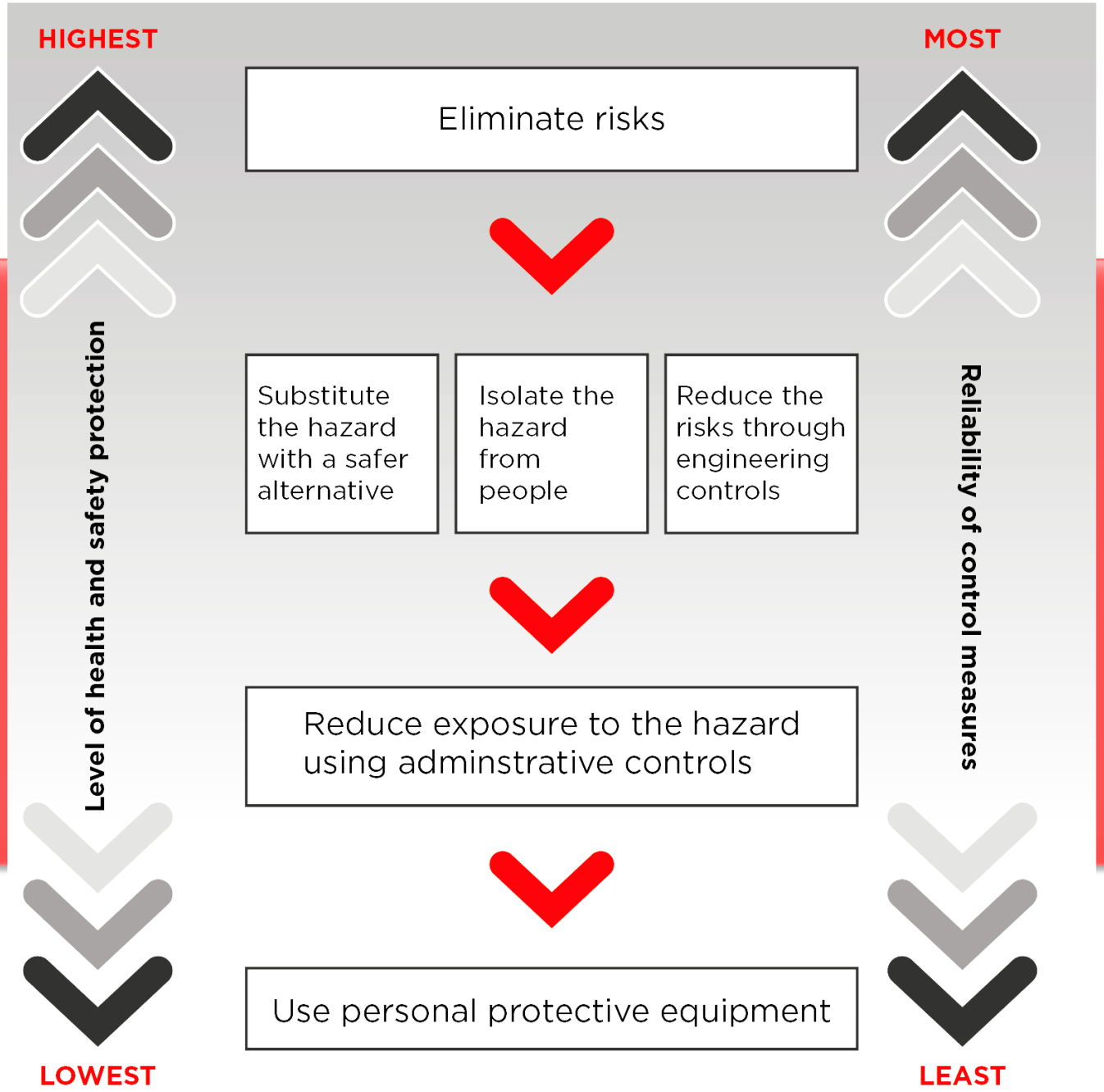
Step 4 - Review control measures
Review the control measures to ensure they are working as planned.

Step 3 - Control risks
Implement the most effective control measure that is reasonably practicable in the circumstances and ensure that it remains effective over time.

The ways of controlling risks are ranked from the highest level of protection and reliability to the lowest. This ranking is known as the hierarchy of control measures.

The hierarchy of control measures can be applied in relation to any risk.

You must always aim to eliminate the risk, which is the most effective control. If this is not reasonably practicable, you must minimise the risk by working through the other alternatives in the hierarchy.



STREGNTHS OF ENVIRONMENTAL RISK ASSESSMENT

A concept (risk or threat) widely understood by the public, clearly illustrating the future consequences of choices.

Provision of explicit criteria for consideration in making decisions, encouraging transparency and accountability.

Creation of a framework for debate that clearly separates risk assessment from decision making, and can provide a vehicle for improving dialogue over highly contentious environmental management or developmental issues.

Providing reassurance to stakeholders that potential changes to the environment due to human activities are being considered.

Building understanding of the relationships between the environment and human activity.

Identification of the consequences of alternative management actions.

Acknowledgement of assumptions and information used.

Risk assessment provides information on potential health or ecological risks, and risk management is the action taken based on consideration of that and other information, as follows:

- **Scientific factors provide the basis for the risk assessment, including information drawn from toxicology, chemistry, epidemiology, ecology, and statistics - to name a few.**
- **Economic factors inform the manager on the cost of risks and the benefits of reducing them, the costs of risk mitigation or remediation options and the distributional effects.**
- **Laws and legal decisions are factors that define the basis for the Agency's risk assessments, management decisions, and, in some instances, the schedule, level or methods for risk reduction.**
- **Social factors, such as income level, ethnic background, community values, land use, zoning, availability of health care, life style, and psychological condition of the affected populations, may affect the susceptibility of an individual or a definable group to risks from a particular stressor.**
- **Technological factors include the feasibility, impacts, and range of risk management options.**
- **Political factors are based on the interactions among branches of the Federal government, with other Federal, state, and local government entities, and even with foreign governments; these may range from practices defined by Agency policy and political administrations through inquiries from members of Congress, special interest groups, or concerned citizens.**
- **Public values reflect the broad attitudes of society about environmental risks and risk management.**

BENEFITS OF RISK ASSESSMENT

The potential benefits of the inclusion of risk assessment include:

- the encouragement for integrated thinking (such as for environmental transport pathways and associated health/ecological effects) by the interdisciplinary teams conducting EIA studies
- The opportunity to focus attention on risk reduction activities such as waste minimization, pollution prevention, and mitigation measures
- The inclusion of emphases on emergency response measures in the event of accidents and associated environmental perturbations.

CASE STUDIES


लोक सभा सचिवालय
नार्थ एवेन्यू स्थित डुप्लेक्स फलटस,
का उद्घाटन
श्री नरेन्द्र मोदी
प्रधान मंत्री
द्वारा
की गरिमामयी उपस्थिति में
नई दिल्ली, सोमवार, 19 अगस्त, 2019
Lok Sabha Secretariat
Duplex Flats, North Avenue
Inaugurated by
Shri Narendra Modi
Prime Minister
-: In the august presence of :-
New Delhi, Monday,19 August, 2019

RISK ASSESSMENT

Risk is a potential that a chosen action or activity will lead to a loss of human or property. Risk assessment is a step for Risk Management. Risk assessment is determination of qualitative and quantitative value of risk related a situation or hazard.

Hazard is a situation that poses a level of threat to life health or environment.

Risk assessment involves the following:

- Hazard Identification
- Vulnerability Analysis
- Risk Analysis
- Emergency Preparedness Plan

1 HAZARD IDENTIFICATION

The project is a Housing Complex and there may be following types of hazards:

1.1 Natural hazard:

Earthquake

Flooding

1.2 Manmade hazard:

Health Injuries

Fire & explosion

Electrical

Mechanical

Radiation

Thermal

Chemical

2 VULNERABILITY ANALYSES

This is a Housing complex hence residents are vulnerable to risks.

3 RISK ANALYSES

The risk is likelihood of harmful effect big or small due to hazard, together with severity of harm suffered. Risk also depends on number of people exposed to hazard.

Risk analysis provides severity of harm from particular type of hazard.

3.1 Earthquake:

The project is located at seismic zone IV where earthquake can occur from 4.0-7.0 Richter scale.

3.2 Flooding:

The project site is located in an area where no natural river or drainage exists. However, flooding can occur due to excess rain.

3.3 Health Injuries

1. Safety nets will be provided at appropriate level and various shafts/ openings will be kept covered to prevent falls, slips, trips etc.

2. Necessary safety belts, helmets and eye-masks as required will be enforced at site.

3. Adequate guardrails will be provided to the staircases and common areas.

4. Adequate guardrails/ fences will be provided around the water storage spaces to prevent drowning accidents.

5. Adequate protection/ fence will be provided around the excavated areas.

6. The machinery and the equipment will be regularly tested and maintained with the specific emphasis against accidents failures.

7. The deployed Safety officers will ensure that the personnel/ labor will be kept at a safe distance from working machinery to avoid accidents/ injuries due to toxic gases/ chemical/ noise.

8. Moving parts of various parts of machineries/ equipment will be properly guarded.

9. Rest rooms and first aid facilities will be made available for the workers.

3.4 Fire & Explosion:

Since it is a Housing Complex, fire can occur due to electrical spark or gas leakage from kitchens. Fire is mainly caused in due to carelessness, short circuits, and malfunctioning of gas regulator, tube, and such related products.

http://www.environmentclearance.nic.in/onlinesearch_state.aspx?type=EC&status=8&statename=Delhi

3.5 Electrical:
The electrical current can pass to the floor & metals due to inadequate insulation or
accidently.
3.6 Mechanical:
The mechanical fault that can cause the risk & hazard include the elevators.
3.7 Radiation:
Due to use of wireless equipment there may be electromagnetic radiation.
3.8 Thermal:
Thermal heat can be generated from the D.G sets and the vehicles in the colony.
3.9 Chemical:
Chemical use in the Housing complex limited to cleaning agents & medicines.

Disaster Management Plan

Disaster Management provides the opportunity to plan, prepare and when needed enables a rational response in case of disasters/ mass casualty incidents (MCI). Disasters and mass casualties can cause great confusion and inefficiency in the hospitals. They can overwhelm the complex resources, staffs, space and or supplies. Lack of any tangible plan to fall back upon in times of disaster leads to a situation where there are many sources of command, many leaders, and no concerted effort to solve the problem.
An internal risk management authority is formed which may undertake periodic evaluation of safety precautions to be followed by each department for hazard recognition with the following steps: Building will be undertaken on a periodical basis to identify the measures taken to prevent/reduce the impact of the potential hazards.

All peoples will be encouraged to routinely assess all activities to identify potential hazards.
To make the proceedings easier, the all the persons will embark upon disaster planning using a phase plan. The building emergency planning is divided into three phases:
1) **Pre-disaster phase**
Planning: Risk assessment and planning for preparedness will be done, the building plans will be formulated and then discussed in a suitable forum for approval.
The disaster manual: The building disaster plan shall be written down in a document form and copies of the same should be available in all the areas of the building.
Education and training: Regular training by suitable drills shall be undertaken in this phase.
2) **Disaster Phase**
Phase of activation: Alter and notification of emergency.
Activation of the chain of command in the building.
Operational phase: This is the phase in which the actual tackling of mass casualties will be performed according to the disaster/emergency plan.
Phase of deactivation: When the administration/ command of the building will be satisfied that the influx of mass casualty victims is not continuing to overwhelm the building facilities.
3) **Post Disaster Phase**
This is an important phase of disaster planning where the activities of the disaster/ emergency phase will be discussed and the inadequacies will be noted for future improvements.


लोक सभा सांसद आवास
(गंगा, यमुना एवं सरस्वती)
का
उद्घाटन
नरेन्द्र मोदी
प्रधानमंत्री द्वारा
Inauguration of
Lok Sabha MPs' Flats
(Ganga, Yamuna and Saraswati)
by
Narendra Modi, Prime Minster
Monday, the
November, 2020


सरस्वती
SARASWATI


GANGA

https://youtu.be/PjcLdNHNprw - uploaded by Explore your Property


supertech


supertech

https://youtu.be/__2aKVJ21r0 – uploaded by Up forest department


supernova


supernova
supertech
GRADE A
POSSESSION
SOON
NOW
LEASING
64
CENTRAL INDUSTRIAL SECURITY FORCE

Q.1 Risk assessment is mandatory to :

a) Category A – new projects + undergoing expansion
b) Category B1 - new projects + undergoing expansion
c) Category B2 - new projects + undergoing expansion
d) None

a) Category A - new projects + undergoing expansion

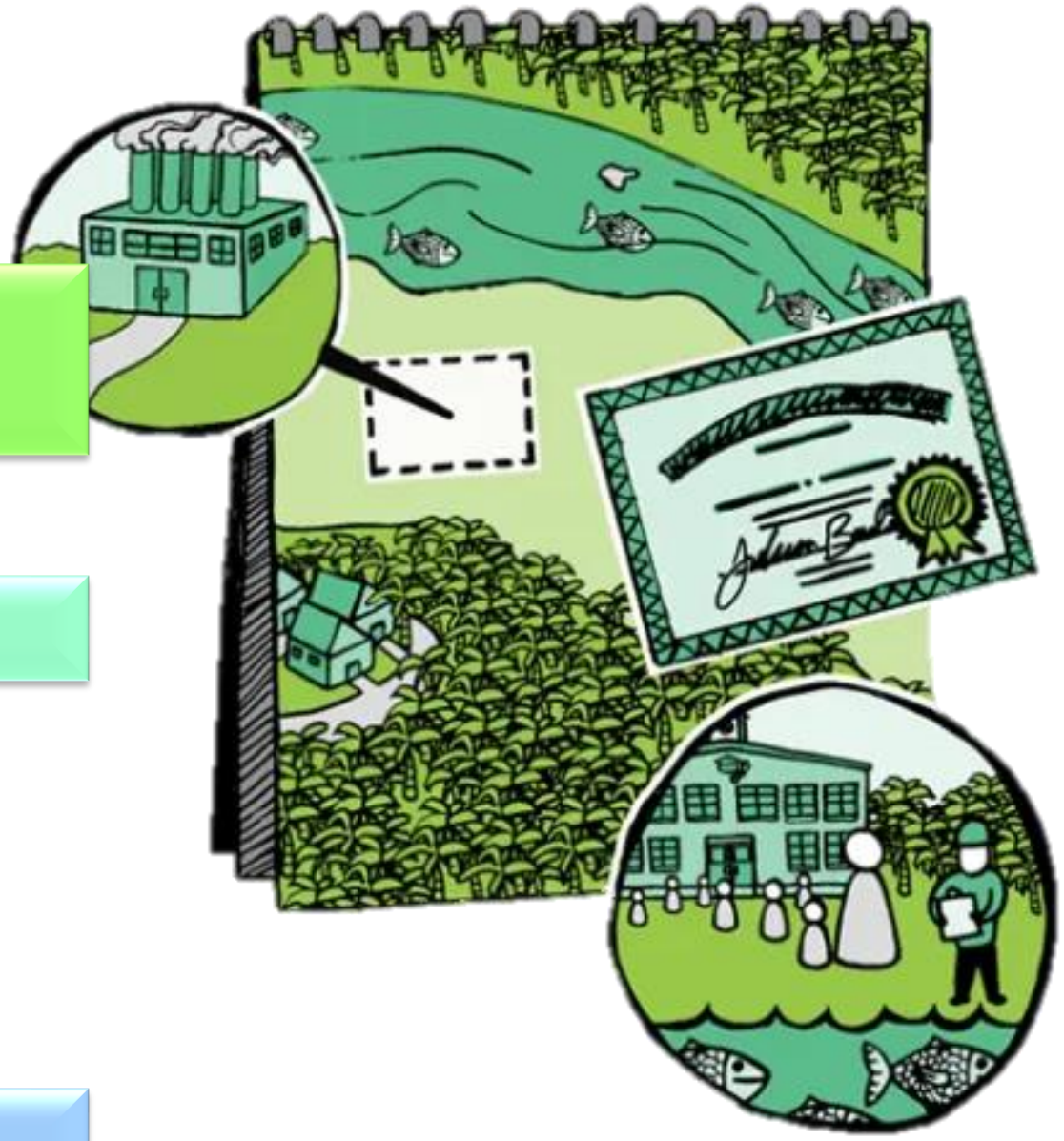
Q.2 What is the full form of MCA?

Maximum Credible Analysis

Q.3 Dose are expressed on the basis of :

a) End point
b) Accuracy
c) Precision
d) Body weight

d) Body Weight



Q.4 Which of the following is not a part of disaster management plan:

a) Mitigation
b) Preparedness
c) Organised
d) Response

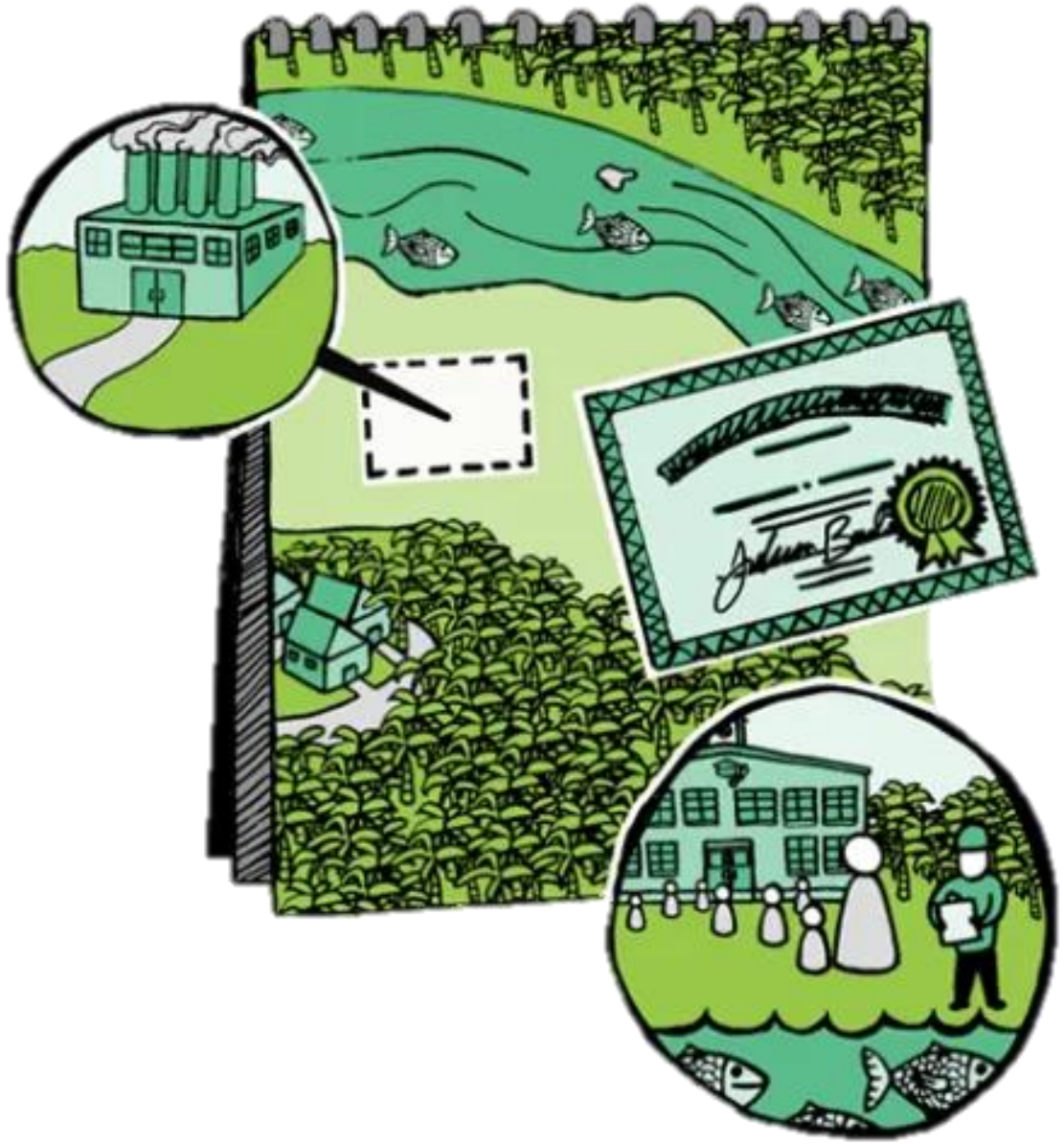
c) Organised

Q.5 What is the formula to calculate Risk Score?

Probability X Score

Q.6 Using Personal Protective Equipment is the most favoured risk management action. True or False?

False



THANK YOU

FOR BEING THE SEEDS OF REVOLUTION