IKM

CHEMICAL STORAGE AND HANDLING WEBINAR

ACTS AND REGULATIONS IN REGARDS TO CHEMICAL MANAGEMENT

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DEPARTMENT OF OCCUPATIONAL SAFETY AND HEALTH

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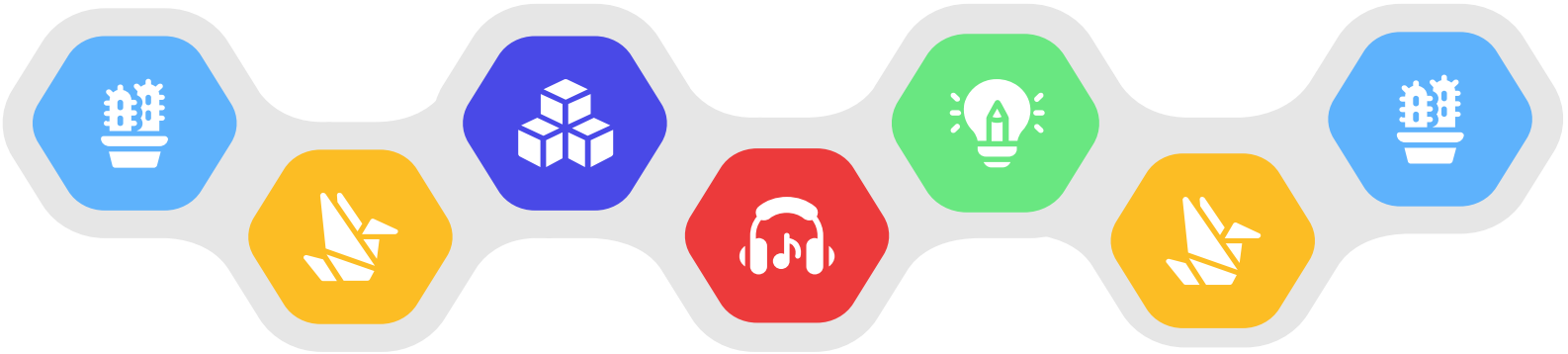
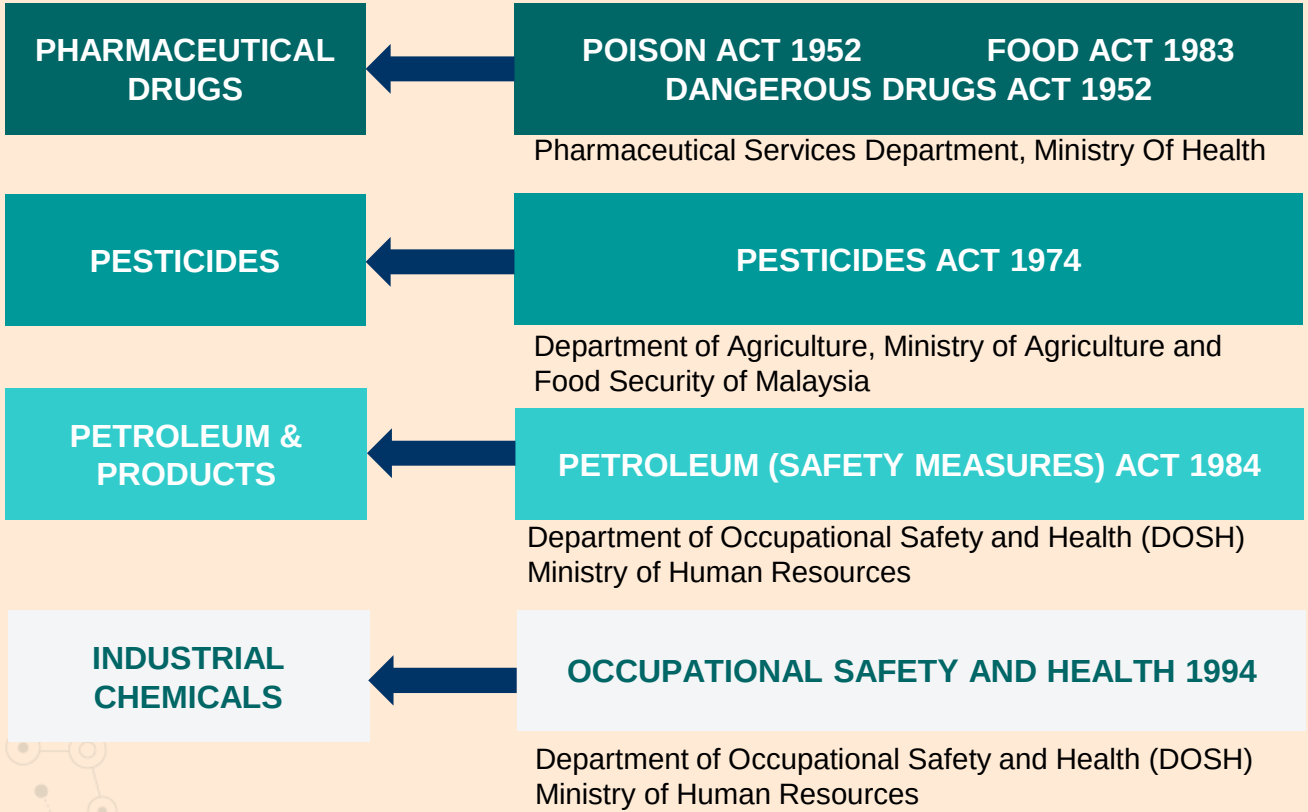


INTRODUCTION: CHEMICAL CONTROL MANAGEMENT



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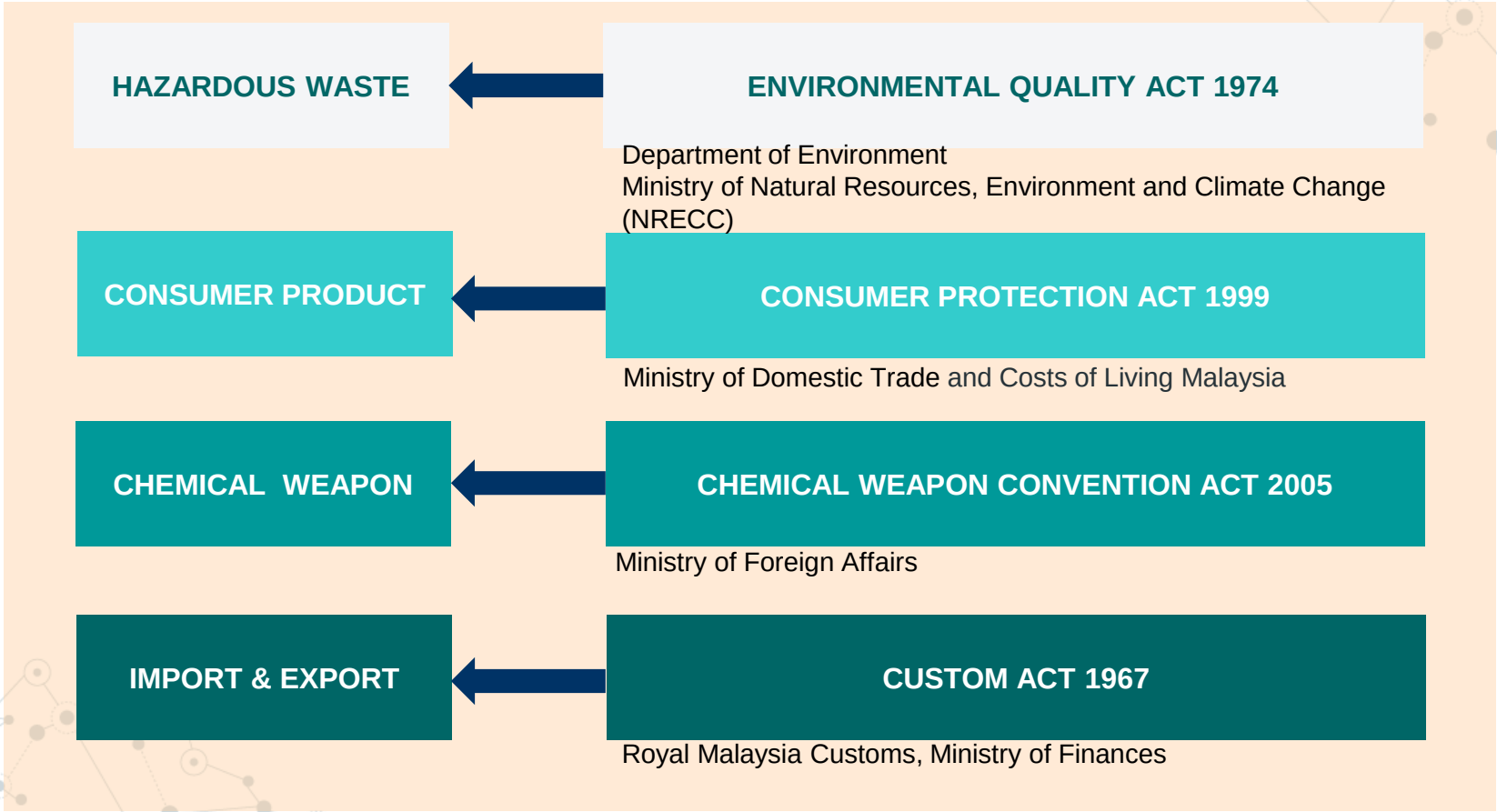


REGULATIONS ON THE SAFE USE OF HAZARDOUS CHEMICAL AT THE WORKPLACE

FACTORIES & MACHINERY ACT 1967 (FMA) repealed in 2021

LEAD 1984

Factory and Machinery (Lead) Regulations

ASBESTOS PROCESS 1986

Factory and Machinery (Asbestos Process) Regulations

MINERAL DUST 1989

Factory and Machinery (Mineral Dust) Regulations

REGULATIONS ON THE SAFE USE OF HAZARDOUS CHEMICAL AT THE WORKPLACE UNDER DOSH

Occupational Safety and Health Act 1994 (OSHA)

- OSH (Prohibition of Use of Substances) Order 1999 **(PROHIBITION ORDER 1999)**
- Control of Industrial Major Accident Hazards Regulations 1996 **(CIMAH 1996)**
- Use & Standard of Exposure of Chemicals Hazardous to Health Regulations 2000 **(USECHH 2000)**
- Classification, Labeling & Safety Data Sheets Of Hazardous Chemical Regulations 2013 **(CLASS 2013)**

SPECIFIC LEGAL REQUIREMENTS

1) The **Occupational Safety & Health (Use and Standard of Exposure of Chemical Hazardous to Health) Regulation 2000 (USECHH Regulation)** stipulates the duty of employers to manage chemicals hazardous to health **USE** at workplaces.

- USE: production, processing, handling, storage, transport, disposal and treatment.

2) The **Occupational Safety And Health (Classification, Labelling And Safety Data Sheet Of Hazardous Chemicals) Regulations 2013** stipulates duty of chemical suppliers either principal suppliers or subsidiary suppliers with respect to hazardous chemicals supplied by them.

3) The **Occupational Safety and Health (Control of Industrial Major Accident Hazards)(CIMAH) Regulations** 1996 with respect to the duty of employers to identify and notify an industrial activity concerning an operation of industrial installations in Schedule 4 or storage of hazardous substances or preparation at any place.

REFERENCES FOR STORAGE

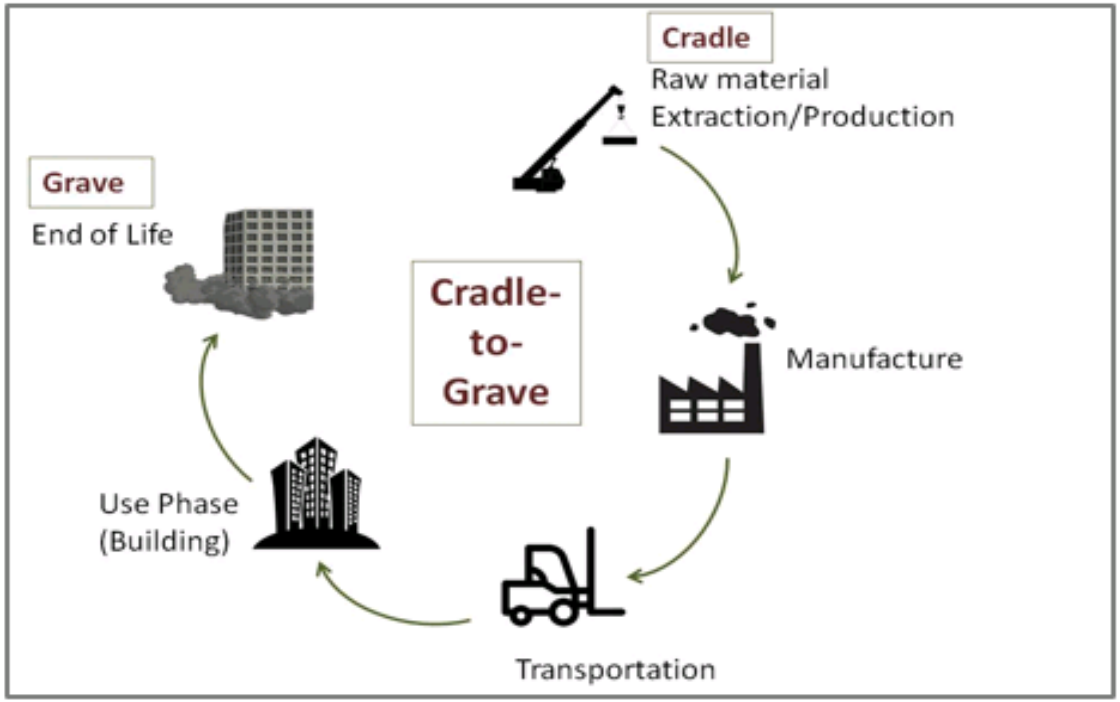
1) DOSH Guidelines on Storage of Hazardous Chemicals : A guide for Safe Warehousing of Packaged Hazardous Chemicals

2) MS 1042: 2015 **Safety in laboratories - Code of practice - Part 9: Storage of chemicals**

3) Other international guidelines

For example: ISSA Storage of chemicals :Guidelines for good practice.

CHEMICAL LIFE CYCLE (CRADLE TO GRAVE)



INTRODUCTION TO USECHH REGULATION 2000

JABATAN KESELAMATAN DAN KESIHATAN PEKERJAAN

USECHH Regulation 2000 - Apply to all workplaces where chemical hazardous to health are used.

Exemption:

1. Radioactive materials
2. Foodstuffs
3. Hazardous to health by explosive/flammable properties or at high/low temperature and high pressure.
4. Pharmaceutical products

<u>This regulation outlines 11 employer's responsibilities to:</u>

1. Identification of chemicals hazardous to health
2. Permissible exposure limit
3. Assessment of risk to health
4. Action to control expose
5. Labelling and re-labelling
6. Information, instruction and training
7. Monitoring of exposure at the place of work
8. Health surveillance
9. Medical removal protection
10. Warning sign
11. Record keeping

1. HAZARD IDENTIFICATION:

ARE THEY CHEMICALS HAZARDOUS TO HEALTH?

DEFINITIONS OF CHTH

(a) is listed in **Schedule I or II USECHH Regulations 2000**;

(b) classified in any hazard class specified under health hazard of the 1st Schedule of CLASS Regulations 2013;

(c) comes within the **definition of "pesticide"** under the Pesticides Act 1974 [Act 149]; or

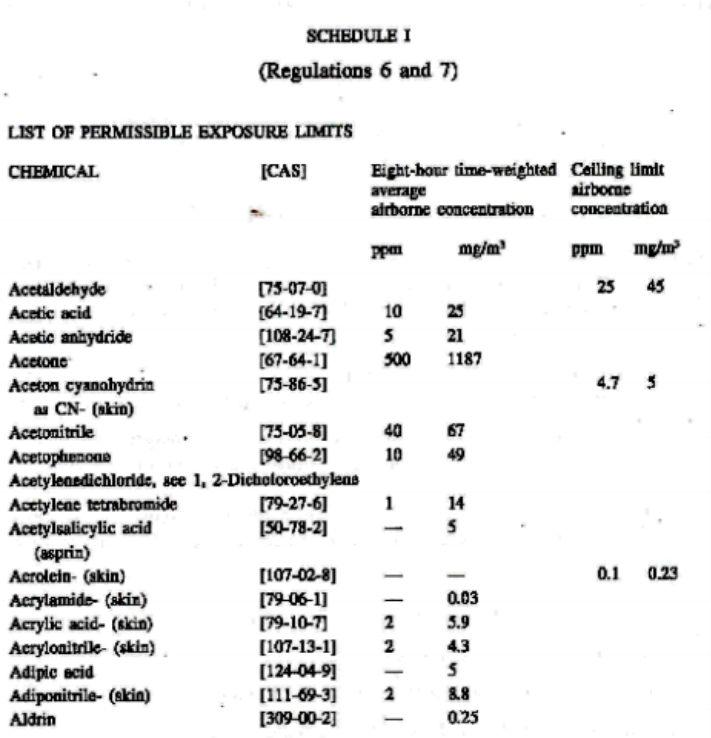
(d) is listed in the **First Schedule** of the Environmental Quality (**Schedule Wastes**) Regulations 2005;

Schedule I & II OF USECHH 2000

SCHEDULE I

[Regulations 6 and 7]

LIST OF PERMISSIBLE EXPOSURE LIMITS



SCHEDULE I

(Regulations 6 and 7)

LIST OF PERMISSIBLE EXPOSURE LIMITS

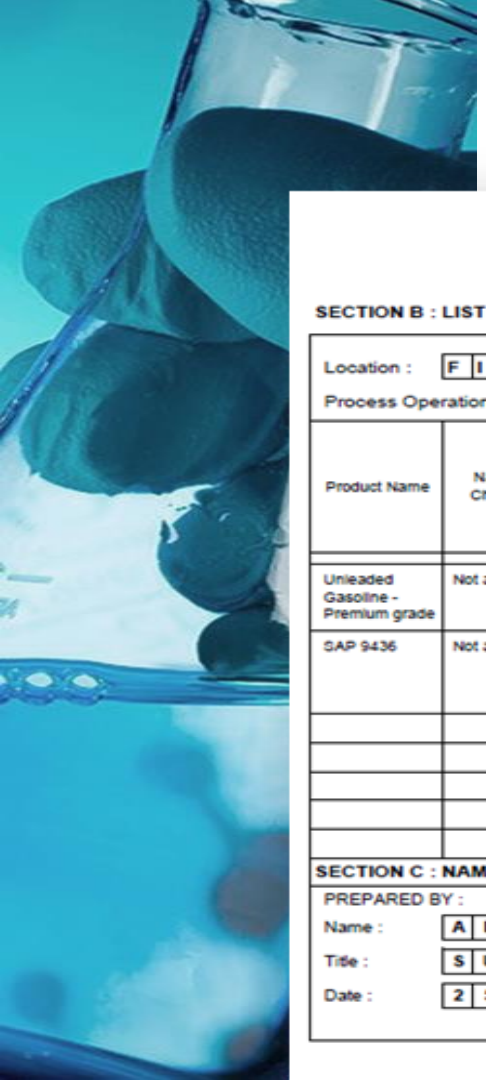
CHEMICAL	[CAS]	Eight-hour time-weighted average airborne concentration		Ceiling limit airborne concentration	
		ppm	mg/m³	ppm	mg/m³
Acetaldehyde	[75-07-0]			25	45
Acetic acid	[64-19-7]	10	25		
Acetic anhydride	[108-24-7]	5	21		
Acetone	[67-64-1]	500	1187		
Aceton cyanohydrin as CN- (skin)	[75-86-5]			4.7	5
Acetonitrile	[75-05-8]	40	67		
Acetophenone	[98-66-2]	10	49		
Acetylenedichloride, see 1, 2-Dichloroethylene					
Acetylene tetrabromide	[79-27-6]	1	14		
Acetylsalicylic acid (asprin)	[50-78-2]	—	5		
Acrolein- (skin)	[107-02-8]	—	—	0.1	0.23
Acrylamide- (skin)	[79-06-1]	—	0.03		
Acrylic acid- (skin)	[79-10-7]	2	5.9		
Acrylonitrile- (skin)	[107-13-1]	2	4.3		
Adipic acid	[124-04-9]	—	5		
Adiponitrile- (skin)	[111-69-3]	2	8.8		
Aldrin	[309-00-2]	—	0.25		

SCHEDULE II

[Subregulation 27(3)]

Chemicals for which medical surveillance is appropriate

1. 4-Aminodiphenyl
2. Arsenic and any of it compound
3. Asbestos (all forms except crocidolite)
4. Auramine, Magenta
5. Benzidine
6. Beryllium
7. Cadmium and any of it compound
8. Carbon disulphide
9. Disulphur dichloride
10. Benzene including benzol
11. Carbon tetrachloride
12. Trichloroethylene
13. n - Hexane
14. bis (Chloromethyl) ether
15. Chromic acid



CHEMICAL HAZARD IDENTIFICATION

Regulation 5 USECHH Reg. : CHEMICAL REGISTER

- What type of chemicals?
- How many?

SECTION B : LIST OF CHEMICALS HAZARDOUS CHEMICAL TO HEALTH

Location : FINISHED PRODUCT
Process Operation : FILLING

No. of Hazardous Chemical : 3

No. of Workers : Male : 4
Female : 3

Product Name	Name of Chemical	Physical Form of Chemical	No. of Worker Exposed	Type of Control Measures		Usage Of Chemical		CAS No.	Name of Active Ingredients	Comply with Classification, Packaging and Labelling Regulation, 1977			Name, Address of Supplier and Contact Number (Tel. No/email)
				Engineering Control	PPE	Type #	Quantity##			CSDS (Y/N)	Class	Label (Y/N)	
Unleaded Gasoline - Premium grade	Not applicable	L	3		PVC Glove	P	250 m3/mth	86290-81-571-43-2	Gasoline Benzene	Y Y	Y Y	Y Y	XYZ Malaysia Sdn Bhd, 27 Jln Ipoh, K. Lumpur Tel. No. 03-2907170
SAP 9436	Not applicable	L	2		Respirator	P	3500 m3/mth	1330-20-7	xylene	Y	Y	Y	AAA Malaysia Sdn Bhd, Lot 21 Senawang Industrial Estate, N. Sembilan Tel. No. 06-4056673

SECTION C : NAME OF PERSON WHO PREPARED OF REVIEWED

PREPARED BY :
Name : ALI AHMAD
Title : SUPERVISOR
Date : 25042000
(Signature)

REVIEWED BY :
Name : LIM MOI LENG
Title : PROD MANAGER
Date : 25052000
(Signature)

ASSESSMENT OF RISK TO HEALTH

CHRA Report

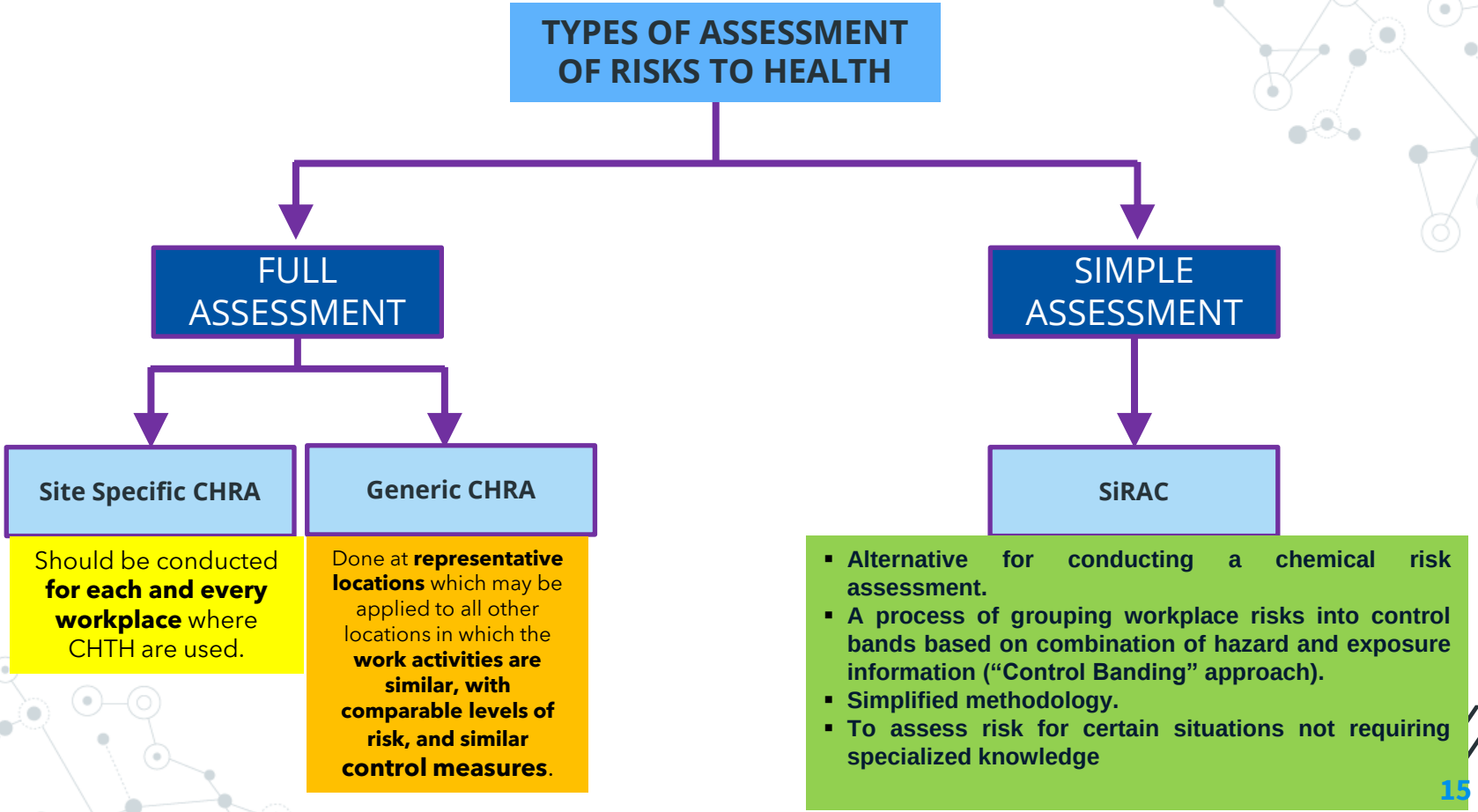
- Employer shall not carry out any work which may or likely to expose employee until written assessment of the risks created by the chemical to health is made.
- Assessment shall be reviewed if there has been a significant change, more than 5 years and directed by DG DOSH.
- Conducted by an assessor registered with DOSH.

ACTION TO CONTROL EXPOSURE

Type of control measures:

- Elimination of CHTH from workplace
- Substitution with less hazardous CHTH
- Total enclosure of process and handling systems
- Isolation of the work to control the emission of CHTH
- Modify process parameters
- Engineering control equipment
- Safe work systems
- Personal protective equipment

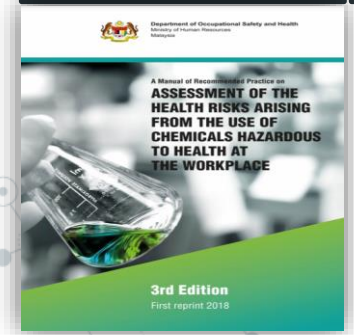
TYPES OF ASSESSMENT OF RISKS TO HEALTH



TYPES OF ASSESSMENT OF RISKS TO HEALTH

TYPES OF ASSESSMENT OF RISKS TO HEALTH

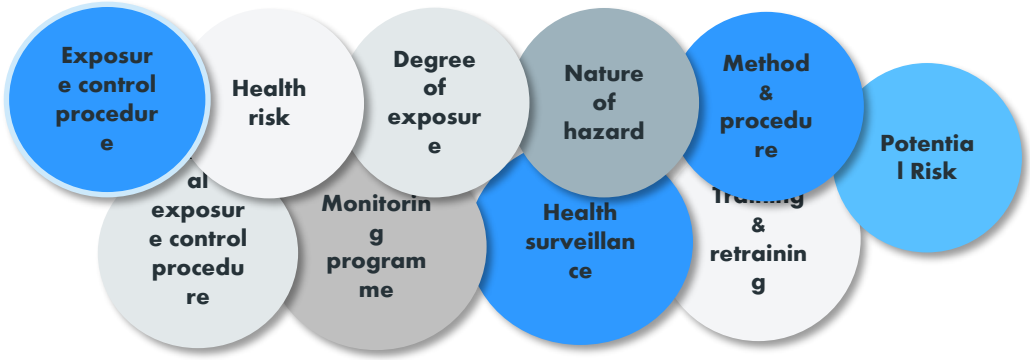
- FULL ASSESSMENT
  - Site Specific CHRA
  - Generic CHRA
- SIMPLE ASSESSMENT
  - SiRAC



2. CARRY OUT RISK ASSESSMENT

Regulation 9 USECHH Reg. : CHEMICAL HEALTH RISK ASSESSMENT

- ✓ **Must be carried out by Assessor (Registered with DOSH)**
- ✓ **Assessor must furnish the employer the report of assessment within one(1) month of completion of assessment**
- ✓ **If result of assessment indicate likely cause immediate danger- assessor must inform employer immediately**
- ✓ **Content of the assessment:**



Level of Risk, and Risk Rating (RR)

Inhalation

Level of risk	Risk Rating (RR)
Low risk	RR = 1 to 4
Moderate risk	RR = 5 to 12
High risk	RR = 13 to 25

Dermal

Level of risk	Risk Rating (RR)
1	Low risk (L)
2	Moderate risk (M1)
	Moderate risk (M2)
3	High (H1)
	High (H2)

DETERMINATION OF ACTION PRIORITY (AP)

Level of Risk	Adequacy of Control	Action Priority (AP)
High	**Inadequate**	x (AP1)
HR or ER could not be determined	-	
Moderate / Low	**Inadequate**	y (AP2)
High / Moderate / Low	Adequate	z (AP3)

Conclusion of Action Priority(As Guidance Only)

(Source: Assessment of the Health Risk Arising from the Use of Hazardous Chemicals in the Workplace (A Manual of Recommended Practice, 3rd Edition), Department of Occupational Safety and Health, 2018)

3. TAKE ACTION TO CONTROL EXPOSURE

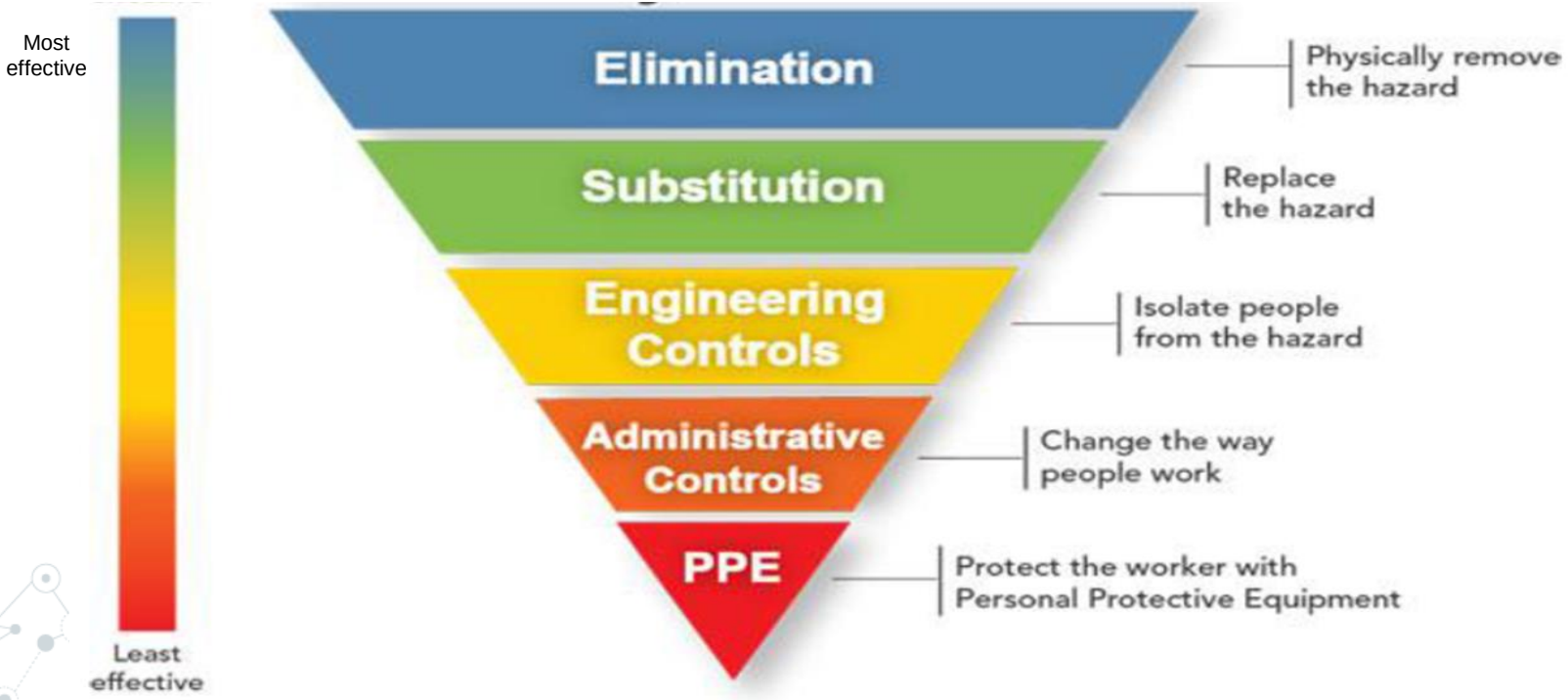
Regulation 14 USECHH Reg. : ACTION TO CONTROL EXPOSURE

Is our control sufficient enough to lower down the exposure level?

- Where an assessment report indicates that action is required to eliminate or reduce the actual or potential exposure of an employee to chemicals hazardous to health
- reduce the exposure level of employees to chemicals hazardous to health to the lowest practicable level, or for those chemicals to which have been assigned with permissible exposure limits, to below the limits

CHEMICAL CONTROL MANAGEMENT

HIERARCHY OF CONTROL




Receiver
Source
Path


EXPOSURE MONITORING
AND
MEDICAL SURVEILLANCE
MARCOM


Chemical Exposure Monitoring

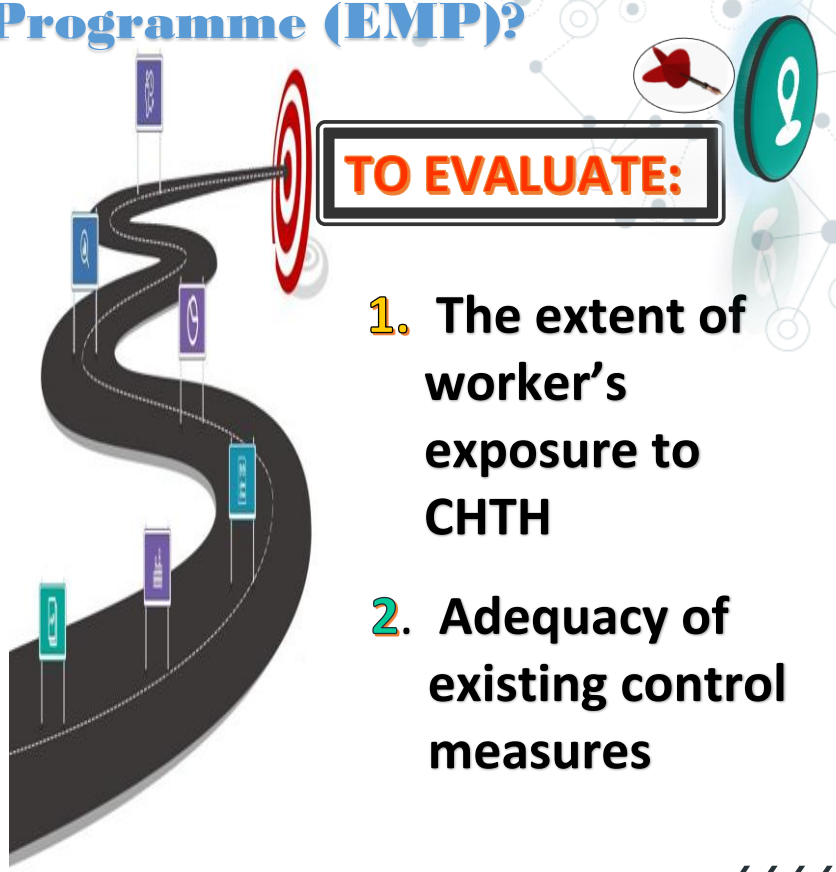

EXPOSURE
MONITORING

What is Exposure Monitoring Programme (EMP)?

Air Monitoring (chemical)

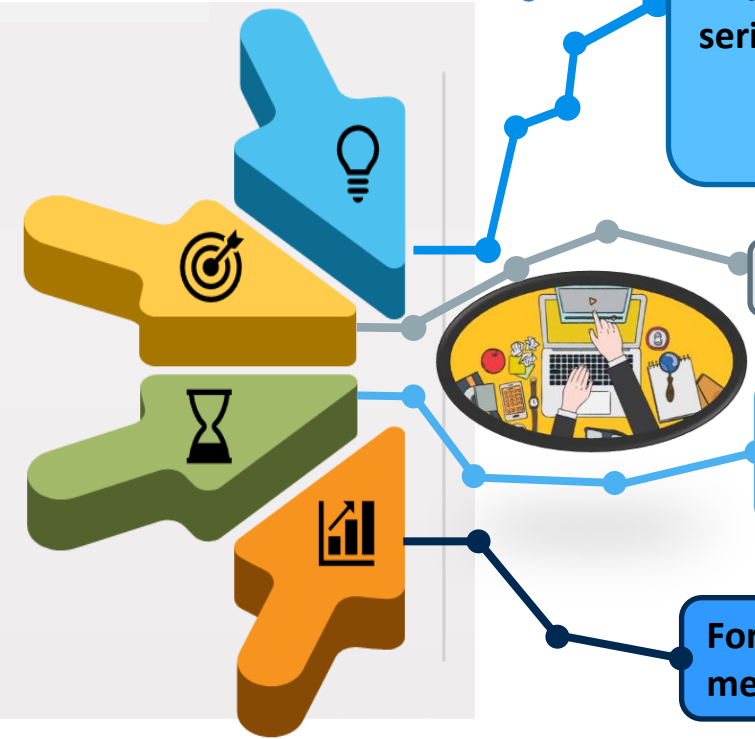
Biological Monitoring

Combination of both



1. The extent of worker's exposure to CHTH
2. Adequacy of existing control measures

Condition where exposure monitoring is considered to be necessary



If failure or deterioration of control measures could result in a serious health effect due to:

- Toxicity of the chemicals; or
- Extent of potential exposure; or
- Both

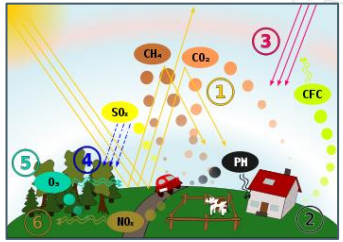
To verify worker's exposure is not exceeding PEL/OEL or BEL

When there are changes to work places, processes, procedures, plants, or engineering control equipment which affect the adequacy of existing control measures

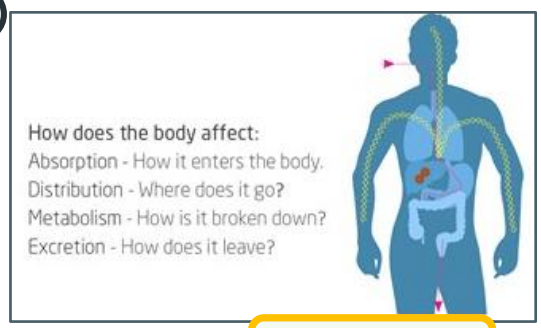
For assurance on the effectiveness of the existing control measures implemented

Fate of Chemical

Chemical in the air



Atmospheric Monitoring

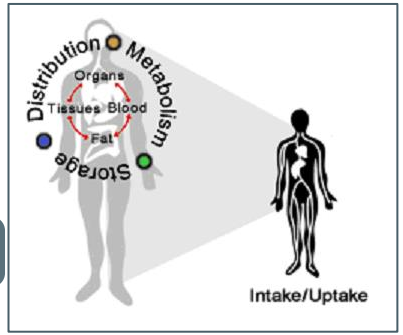


Absorption

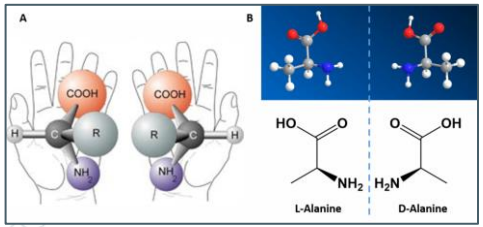
Distribution

Excretion

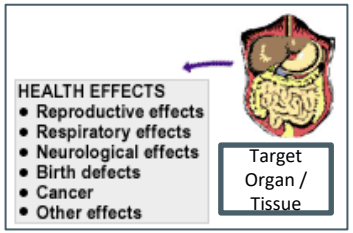
Biotransformation



Biological Monitoring



Binding to Target Organ Adverse Effect

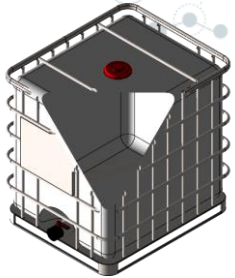


Medical Surveillance

Fate of chemical from the environment to the target organ in the body

Storage of Hazardous Chemicals

INTRODUCTION



✓ To provide information on:

- design,
- construction,
- operation and
- maintenance

of storage areas and buildings used for storing hazardous chemicals when they are contained in packages such as drums, gas cylinders, bottles, boxes, intermediate bulk containers (IBCs) and sacks. These measures are designed to protect people at work and others who may be affected by the storage of hazardous chemicals.

KEY RESPONSIBILITIES

The Supplier or Owner of the Chemicals

- Satisfy himself of the suitability of the warehouse
- Ensure that the warehouse keeper formally acknowledges receipt of information on hazards of the materials, recommendations for safe handling and instructions to be followed

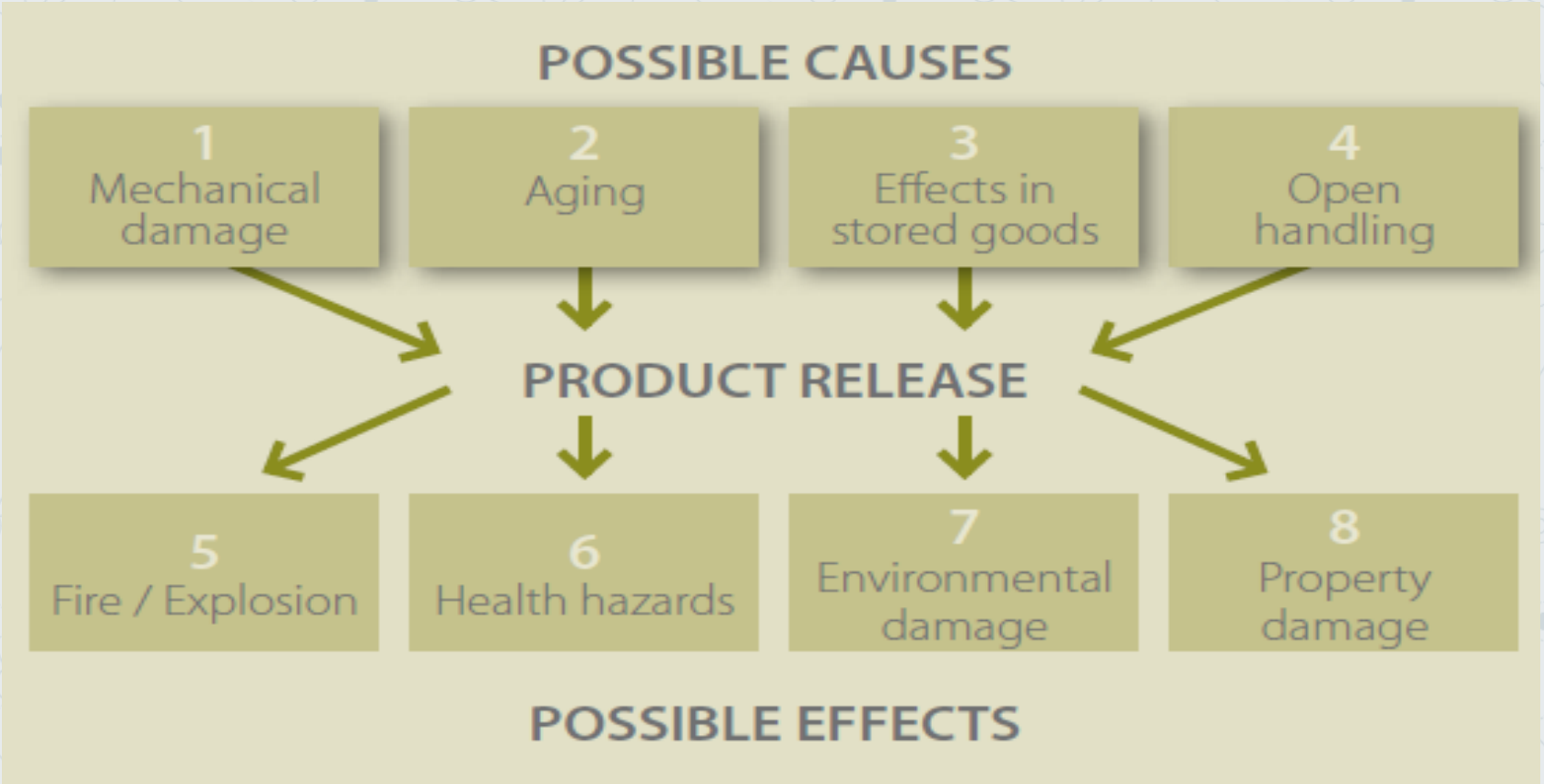
The Warehouse Employer/Owner

- To provide and maintain plant and systems and that are safe and without risks to health;
- To provide information, instruction, training and supervision to ensure the safety and health of his employees at work;
- To provide and maintain working environment for his employees that it is safe, without health risks and with adequate welfare facilities.

The Warehouse Keeper/Employees

- To take reasonable care for the safety and health of himself and of other persons who may be affected by his acts or omissions at work;
- To wear or use any protective equipment or clothing provided by the employer for the purpose of preventing risks to his safety and health

HAZARDS RELATED TO STORAGE OF CHEMICALS



HAZARD IDENTIFICATION AND COMMUNICATION

Safety Data Sheet (SDS)

a) Supplier must provide SDS of the chemicals stored in the warehouse are clearly understood by all personnel.
b) The purpose of SDS is to provide information needed to allow for the safe handling of hazardous chemicals.
c) SDS should describe the chemical's identity, relevant health hazard information, and precautions for use, safe handling information and other relevant information related.
d) SDS should contain appropriate information in accordance with Occupational Safety And Health (Classification, Labelling And Safety Data Sheet Of Hazardous Chemicals) Regulations 2013

Classification, Labelling and Safety Data Sheet of Hazardous Chemicals

a) The employer shall ensure that chemicals to be stored should be classified, labeled and/or relabeled, refer to CLASS Regulation 2013
b) The details on which containers are to be labeled and relabeled, refer USECHH Regulations 2000.

Chemical Register

a) The chemical register consists of the chemical inventory and the chemical safety data sheets, refer Guideline for the Preparation of a Chemical Register 2000.

SITING AND DESIGN OF STORAGE AREA

Siting

a) Located away from densely populated areas and from drinking water sources.

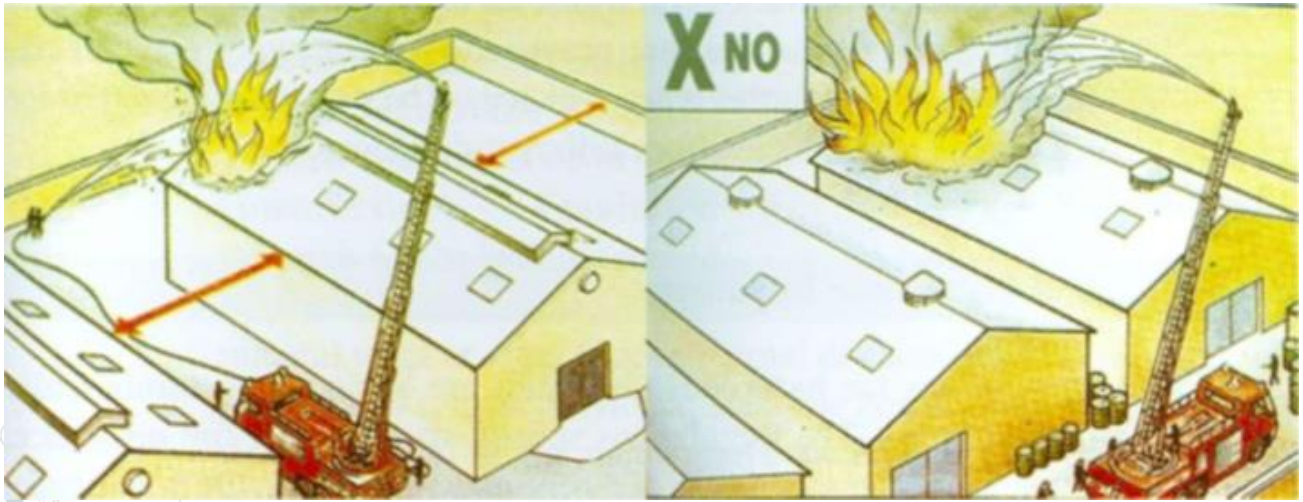
b) Location should provide easy access for transport and emergency services.

c) Must be on firm standing ground.

d) Must be protected against flooding.

Site Layout

Should permit safe movement and transport of materials; it should have sufficient space to give reasonable working conditions and allow clear access from two sides.



Security

a) Site and buildings should be adequately protected from trespassers by secure fencing, gates and other security measures.

b) The site should be surrounded by a secure boundary wall or fence.

c) The number of access gates should be kept to a minimum consistent with efficient operation.

Design of Warehouse Buildings

a) Storage buildings for hazardous chemicals are subject to controls under building legislation.

b) The layout of warehouses should be designed in accordance with the nature of materials to be stored with adequate provision for emergency exits.

c) Warehouses should be substantially closed in and capable of being locked.

d) The standards of fire resistance required under health and safety legislation are attended to allow sufficient time, in the event of a fire, for the alarm to be raised, for people to escape, and for fire fighting to be put safely in hand.

WAREHOUSE/STORE MANAGEMENT & EMERGENCY

1) Each chemical hazardous to health stored in a warehouse should be listed in a chemical register and be evaluated.
2) Employer should conduct chemical health risk assessment.
3) Storage requires combining several control measures, including isolation, engineering controls and safe work practices.

Isolation

Separated room specially design for segregation of incompatible chemical Example Flammable, Toxic, Oxidising & Corrosive

Engineering Controls

Engineering controls are plant or processes that minimise generation of hazardous chemicals, suppress or contain hazardous chemicals, or that limit the area of contamination in the event of spills and leaks.

Safe Work System and Practices

Safe work system practices are administrative practices, which require workers to work in a safer way. These contain administrative controls, good housekeeping and personal hygiene.

Emergency Response Plan

1) The employer of the warehouse should establish an emergency response plan which describes the immediate, specific response to an emergency.

2) The plan should be established in conjunction with local authorities and Fire and Rescue Department.

Components of Emergency Response Plan

a) List of emergencies arising from the warehouse operation such as fire, spillage and chemical release;

b) Location/center where the place or room to be used during emergency for the purpose of strategic planning to handle such emergency and list of equipment or facility at the center;

c) Organisation and emergency team and their responsibility or activity;

d) Procedures used to handle emergencies

Conclusion

- **There are many agencies involved in chemical management in Malaysia.**
- **Malaysia has introduced few local legislations to manage chemicals hazardous to health at work.**
- **All employers need to play their role in managing these hazardous chemicals**
- **Risk assessment need to be conducted to determine level of risk taking into consideration of adequacy of existing control measures**
- **Significant Risk and Not Adequately Control warrant for immediate action to be taken by employers. i.e AP1**

Thanks!

Any questions?

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