İTÜ OCCUPATIONAL HEALTH AND SAFTY UNIT COORDINATION

ITU WORKPLACE HEALTH and SAFETY UNIT

Basic Occupational Safety Training

CONTENT

- The definition of Occupational Safety and Health (OSH)
- Occupational Safety and Health Laws In Turkey
- 4857 Labor Law
- OSH Basic Principles and Holistic Approach
- General Responsibilities of Government, Employer and Worker regarding the OSH Culture
- Hazard Classification of the Workplaces
- Procedures, principles and basic concepts for Occupational Safety Training

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OCCUPATIONAL SAFETY AND HEALTH (OHS)

THE DEFINITION OF OSH

- **Occupational safety and health** (**OSH**) also commonly referred to as **occupational health and safety** (**OHS**) or **workplace health and safety** (**WHS**) is an area concerning the safety, health and welfare of people engaged in work or employment.
- The objectives of OHS programs mainly cover providing a safe and healthy work environment. The effective OHS strategies are also expected to protect co-workers, family members, employers, customers, and many others who might be affected by the workplace environment.

A safety culture can only be existed with an internalized information.

Occupational Safety and Health (OSH) Concept

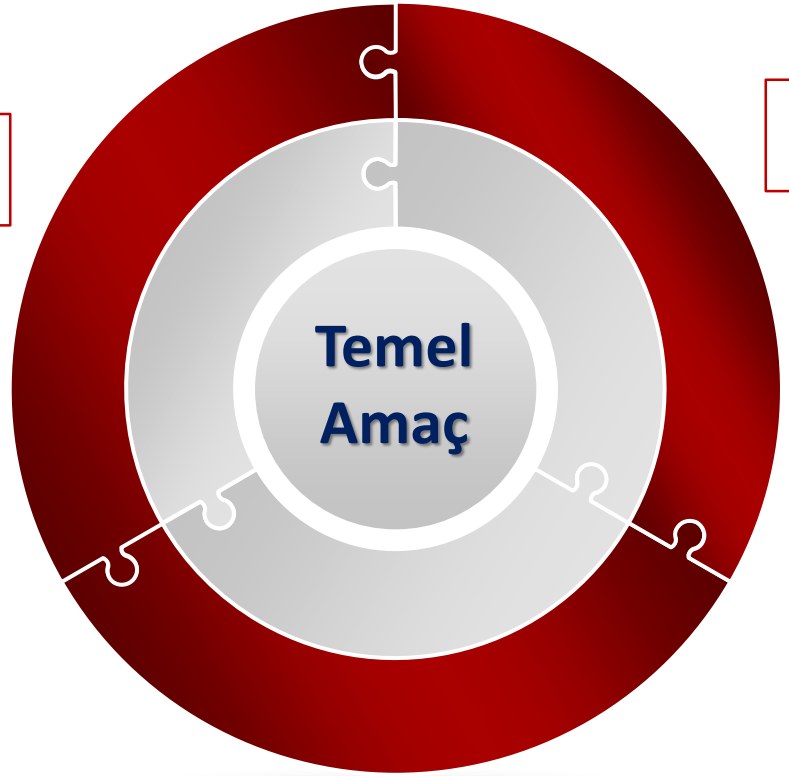
OSH offers a wide selection of training courses and educational programs to help broaden both workers' and employers' knowledge as well as awareness on the recognition, avoidance, and prevention of potential hazards regardinf safety and health in their workplaces. OSH also offers training and educational materials that help businesses train their workers and comply with the Occupational Safety and Health Act.

The Mission of OSH

- The mission of OSH is to assure safe and healthy working conditions employees by setting and enforcing legislations as well as standards and by providing training, outreach, education and assistance as well as continous monitoring.
- The core missions of OSH are two folded:
  - ✓ Developing job safety and health standards embodied with worksite inspections.
  - ✓ Providing training programs to increase knowledge and awareness regarding each pillar of occupational safety and health concept.

İSG AMACI

Employee Protection



Business Protection

Icrease Service & Quality

Why is OSHA Important to You?

- 4,405 workers were killed on the job in 2013 (3.2 per 100,000 full-time equivalent workers)
- An average of nearly 12 workers die every day
- Nearly 3.0 million serious workplace injuries and ilnesses were reported by private sector employers in 2012

OSHA Makes a Difference

- **Worker deaths in America are down–on average, from about 38 worker deaths a day in 1970 to 12 a day in 2013.**
- **Occupational injuries and illnesses are down–from 10.9 incidents per 100 workers in 1972 to 3.0 per 100 in 2012.**

OCCUPATIONAL HEALTH AND SAFETY LAW IN TURKEY

OCCUPATIONAL HEALTH AND SAFETY LAWS IN TURKEY

Occupational Health and Safety Law (No. 6331), published in the Official Gazette dated 30 June 2012 and numbered 28339, entered into force as of **01 January 2013**.

APPLICATION-SCOPE-EXTENT AND EXCEPTIONS in LAW NO: 6331

Law No. 6331 is applied to all works and workplaces in both public and private sector, employers of these workplaces and their representatives, all workers including apprentices as well as interns regardless of their field of activity.

Enforcement-Scope - Extent and Exceptions – Law No: 6331

ENFORCEMENT:

- All domestic and businesses to the public and private sectors,
- Employers' representatives,
- IR and interns, including all employees, regardless of whether the subject matter of their activities are applied to the INA.

Application-Scope - Extent and Exceptions – Law No: 6331

THE PURPOSE OF THIS LAW;

Workplace health and safety is governed by a system of laws, regulations and compliance codes which set out the responsibilities of employers and workers to ensure that safety is maintained at work.

Enforcement-scope-extent and exceptions – Law No: 6331

EXCEPTIONS ;

However, Law No. 6331 is not applicable to the following activities and persons:

A. **Activities of the Turkish armed forces, the police and the undersecretary of Nnational intelligence organisation except for those employed in workplaces such as factories, maintenance centres, sewing workshops, etc.**

B. **Intervention activities of disaster and emergency units.**

C. **Domestic services.**

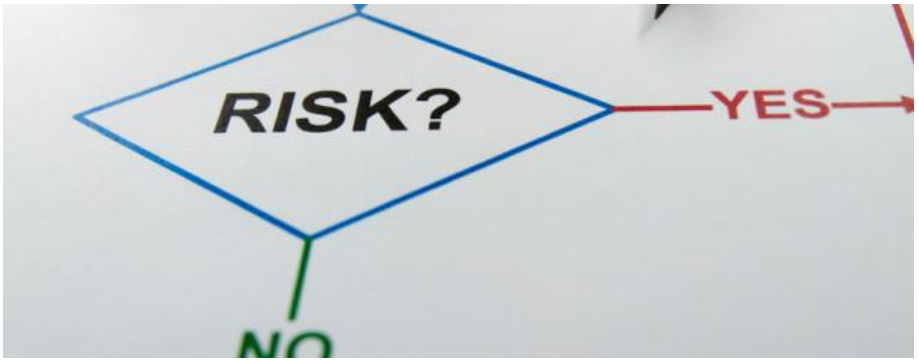
Scope and exceptions – LAW NO: 6331…

D. People producing services in their own name and on their own account without employing workers.

E. Prison workshop, training, security and vocational course activities within the framework of improvements carried out throughout the enforcement services for convicts and inmates.

THE LAW BROUGHT RESPONSIBILITIES TO EMPLOYERS AND EMPLOYEES

BY ENFORCEMENT OF THE NEW LAW



Employers in each workplace must

- Provide occupational health and safety training
- Conduct Risk analysis and emergency response plan
- Perform each kind of test and measurement
- Form H&S Committee
- Help workers to select H&S representative

HEALTH
AND
SAFETY
TRAINING

The Employees' Right for Abstain from the Work within the scope of Occupational Health and Safety Law

- (1)Workers exposed to serious and imminent danger can apply to the committee (or the employer when the absence of a committee) to request the identification of the hazard and potential measures for emergency intervention. The committee convenes without delay and the employer makes a decision immediately and write this decision down. The worker and workers' representative shall be notified in written.
- (2) The worker can abstain from work until necessary measures are put into practice once the committe or employer decides in the direction of the employee's request. The worker shall be entitled to payment during this period of abstaining from work and his/her rights arising under the employment contract and other laws shall be reserved.

The Employee's Right to Avoidance of the Work within the Occupational Health and Safety Law

- (3) The workers that have experienced serious event and/or imminent danger shall leave their working area and moved to a safe place without any necessity to comply with the requirements. Workers may not be placed at any disadvantage because of their action.
- (4) Where the necessary measures are not taken despite the requests by workers, workers under labour contract might terminate their employment contract in accordance with the provisions of the law applicable to them. As for the workers under collective bargaining agreement, the abstention period as defined in this article shall be deemed as actual work time.

LABOR LAW No. 4857

4857 LABOR LAW

SCOPE;

The purpose of this Law is to regulate the working conditions and work-related rights and obligations of employers and employees who work under an employment contract.

4857 Labour Law: The employer may break the contract, whether for a definite or indefinite period, before its expiry or without having to comply with the prescribed notice periods, in the following cases:

- **H-** If the employee insists in refusing to perform his/her duties even being warned,
- **I-** If either wilfully or through gross negligence the employee imperils safety or damages machinery, equipment or other articles or materials in his care, whether these are the employer's property or not, and the damage cannot be offset by his thirty days' pay.

The employer may break the contract, whether for a definite or indefinite period, before its expiry or without having to comply with the prescribed notice periods.

4857 Labour Law : Annual Leave with Pay and Leave Periods

The length of the employee's annual leave with pay shall not be less than;

- Fourteen days if his/her length of service is between one and five years, (five included),
- Twenty days if his/her length of service is more than five and less than fifteen years,
- Twenty-six days if his/her length of service is fifteen years and more (fifteen included)

For employees **below the age of eighteen** and **above the age of fifty**, the length of annual leave with pay must not be **less than twenty days**.

The length of annual leave with pay may be increased by employment contracts and collective agreements

OSH BASIC PRINCIPLES AND HOLISTIC APPROACH

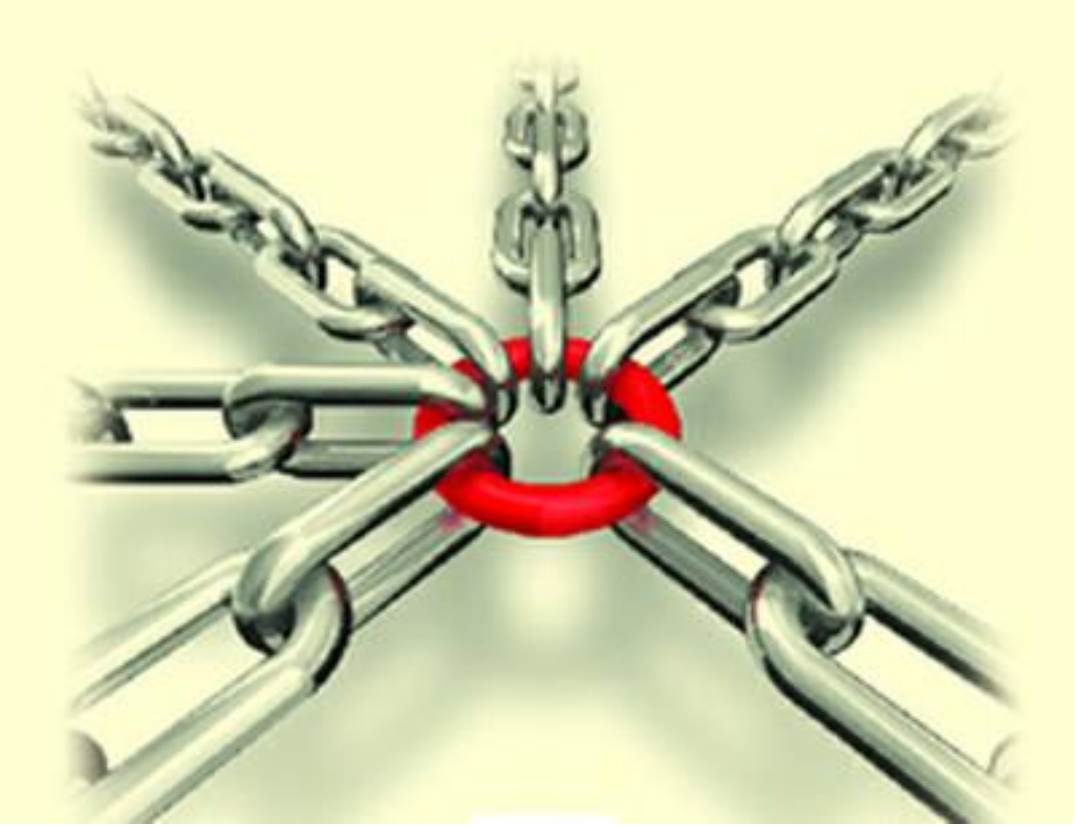
OHS BASIC PRINCIPLES

➢ **OSH there are 3 basic principles;**

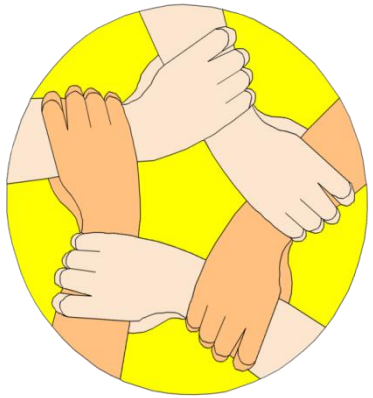
- ✓ Planning
- ✓ Continuity
- ✓ Method

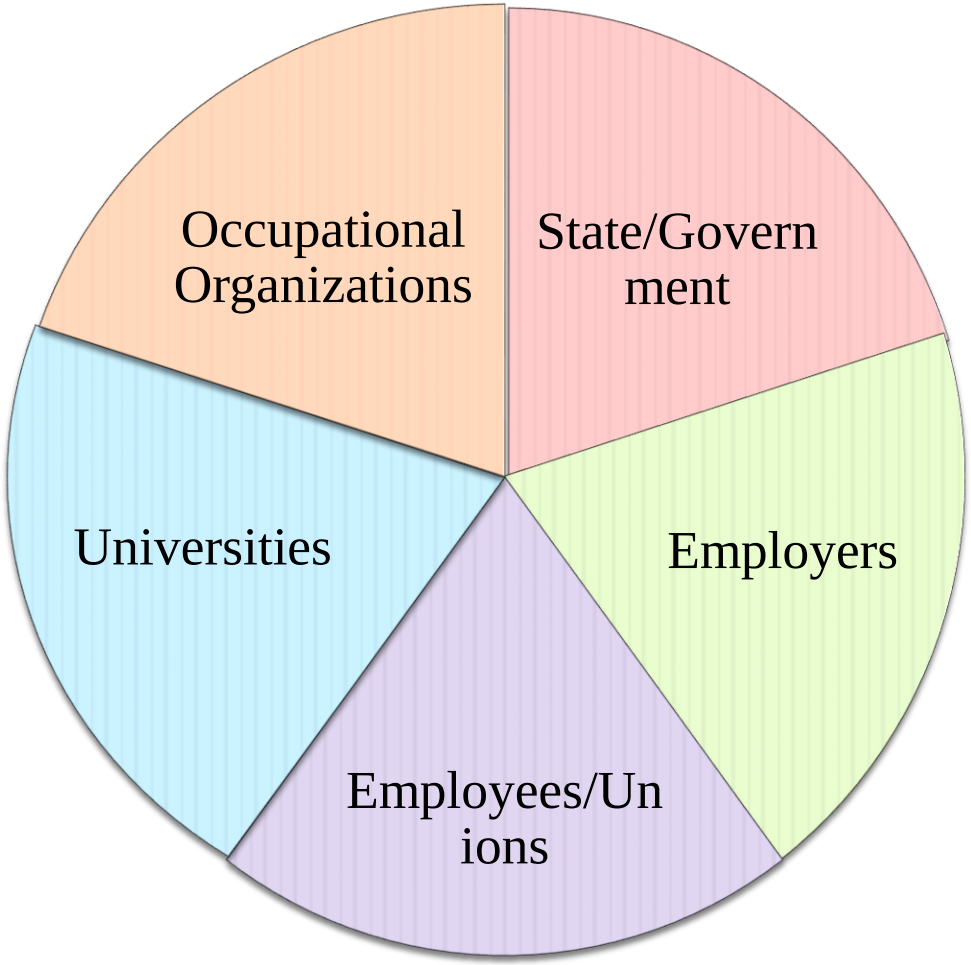
OSH HOLISTIC APPROACH

- Occupational Health and Safety is a multi-disciplinary approach.
- OHS is embodied with a participation of diverse stakeholders.
- The solution of a problem becomes quite challenging once the identification is main stakeholders is not carried out.



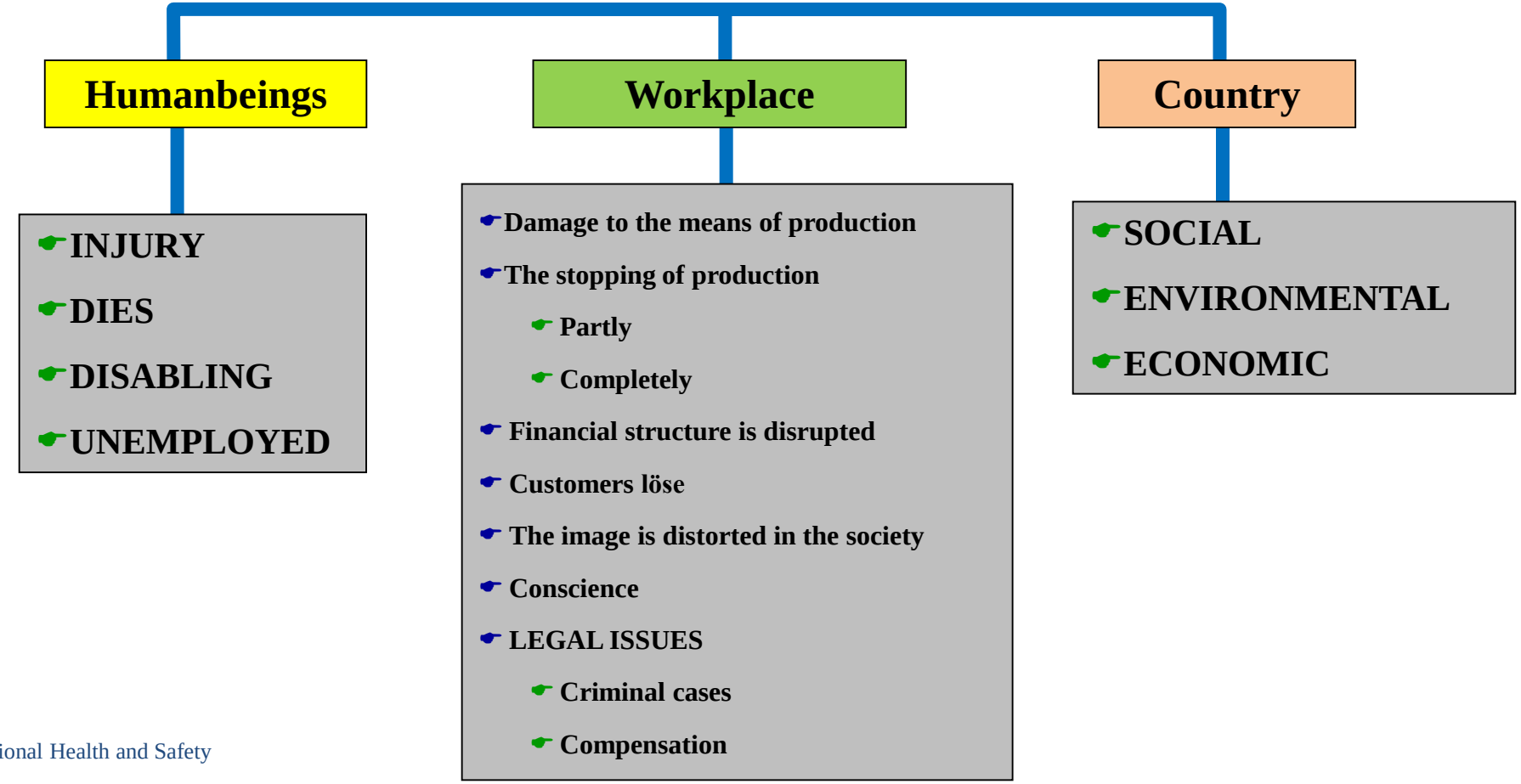
İSG' de Bütünsel Yaklaşım…





OSH Holistic Approach

How affected The parties?



GENERAL RESPONSIBILITIES OF GOVERNMENT, EMPLOYER AND WORKER ON OSH CULTURE

THE OSH CULTURE

Occupational safety culture;

- Occupational safety is of utmost importance being a lifestyle,
- Safety is mainly based on information,
- A safety culture can only be constituted by internalized knowledge.
- Occupational accidents and occupational diseases are likely to ocur once occupational safety is ignored.
- **Government, employer(s) and worker(s)** have significant responsibilities on the OSH culture.

Governmental responsibilities in terms of Occupational Health And Safety are as follows:

- Enforcement of occupational health and safety legislation,
- Workplace inspections,
- Dissemination of information,
- Promotion of training, education and research,
- Providing an incentive-based approaches,

The Role Of Government is;

- To ensure that every employee benefits from OHS services, regardless of the number of employees in the workplace,
- To provide necessary condition and standards by the regulations
- To ensure government policies.

The Role Of Government is;

- to prevent unrecorded employments,
- to inhibit child employmenst,
- to eliminate the gender apartheids,
- to provide a support for social security,
- to prevent the injustice of income distribution
- to determine a livable minimum wage

The Role Of Government is;

- to organize public health services,
- to establish a reliable registration System,
- to analyze the occupational accidents in scientific manner,
- to create awareness of employees' health,
- to protect the workers by laws.

GENERAL RESPONSIBILITIES OF EMPLOYERS are to

- Take the necessary measures for the safety and health protection of workers,
- Carry out a risk assessment,
- The workers' obligations in the field of safety and health at work shall not affect the principle of the responsibility of the employer,
- Take all the measures related to health and safety at work,

Responsibilities of Employers are to

- Avoid risks,
- Evaluate the risks which can not be avoided,
- Combat the risks at source,
- Adapt the work to the individual, especially in terms of designing the work places,
- Provide adaptation to the technical progress,

Responsibilities of the Employers are to

- Replace the dangerous material/case by the non-dangerous or those of less dangerous.
- Develope a coherent prevention policy which covers technology, organization of work, working conditions, social relationships and the influence of factors related to the working environment,
- Give priority to collective protective measures over individual protective measures,
- Giving appropriate instructions to the workers,

Responsibilities of the Employers are to

- Ensure that each worker receives safety and health training,
- Provide emergency plans regarding the fire-fighting and first aid,
- Keep a list of all occupational accidents and diseases suffered by the workers,

Responsibilities of the Employers are to

- Consult workers or representatives authorized by the unions in enterprises with more than two workers' representatives or workers' representatives themselves in the absence of trade union representative to ensure the consultation and participation of workers

WORKERS' OBLIGATIONS

It shall be the responsibility of each worker to take care as far as possible of his/her own safety and health and that of other persons affected by his/her acts at work in accordance with the training and instructions related to occupational health and safety given by the employer.

Workers’ Obligations are to

- Make correct use of machinery, equipment, tools, dangerous substances, transport equipment and other means of production,
- Make correct use of the personal protective equipment supplied to them and protect themselves,
- Cooperate with the employer and/or workers' representative to enable any tasks or requirements imposed by the competent authority to protect the safety and health of workers at work to be carried out,
- Cooperate with the employer and/or workers' representative for occupational health and safety of workers within their field of activity,

HAZARD CLASSIFICATION OF WORKPLACES

HAZARD CLASSES OF A WORKPLACE

In accordance with Article 9 of the Occupational Health and Safety Law No. 6331, the Workplace Hazard Classes are listed in terms of occupational health and safety.

Hazard Classification of a Workplace

Very Dangerous

- A class specialist

Dangerous

- B class specialist

Less Dangerous

- C class specialist

PROCEDURES AND PRINCIPLES OF OCCUPATIONAL HEALTH AND SAFETY TRAINING

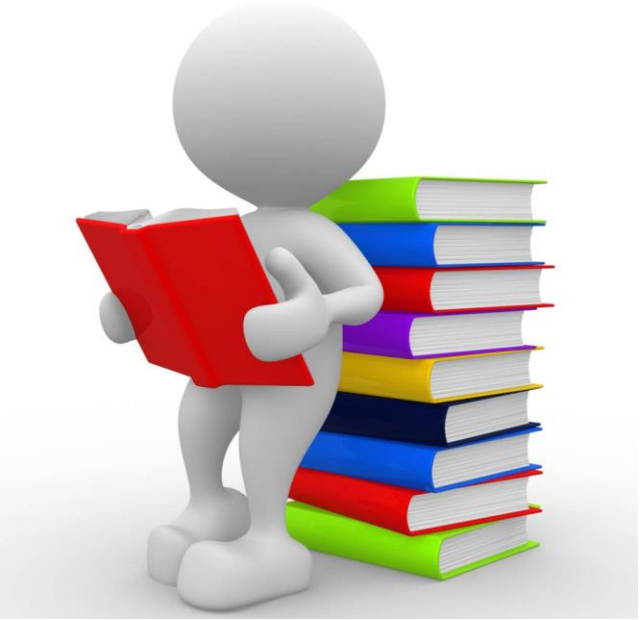
EMPLOYER'S RESPONSIBILITIES WITH RESPECT TO OHS TRAINING

a) Preparation and implementation of training programs,

b) Provide suitable location, tools and equipment for training,

c) To ensure the participation of employees in these programs,

d) Submission of Training Certificate to the employers at the end of the program.



COMPULSORY HEALTH AND SAFETY TRAINING SHALL BE GIVEN

WHEN

- Getting started to work
- The workplace is changed
- The work equipments are changed
- The new technologies are applied.

IN TERMS OF OHS;

It is necessary to

- Believe and to be believed,
- Getting informed and get informed,
- Apply and to be applied

By all the involved stateholders.

TERMS, DEFINITIONS and FUNDEMENTAL INFORMATION

HEALTH - WORKPLACE HEALTH

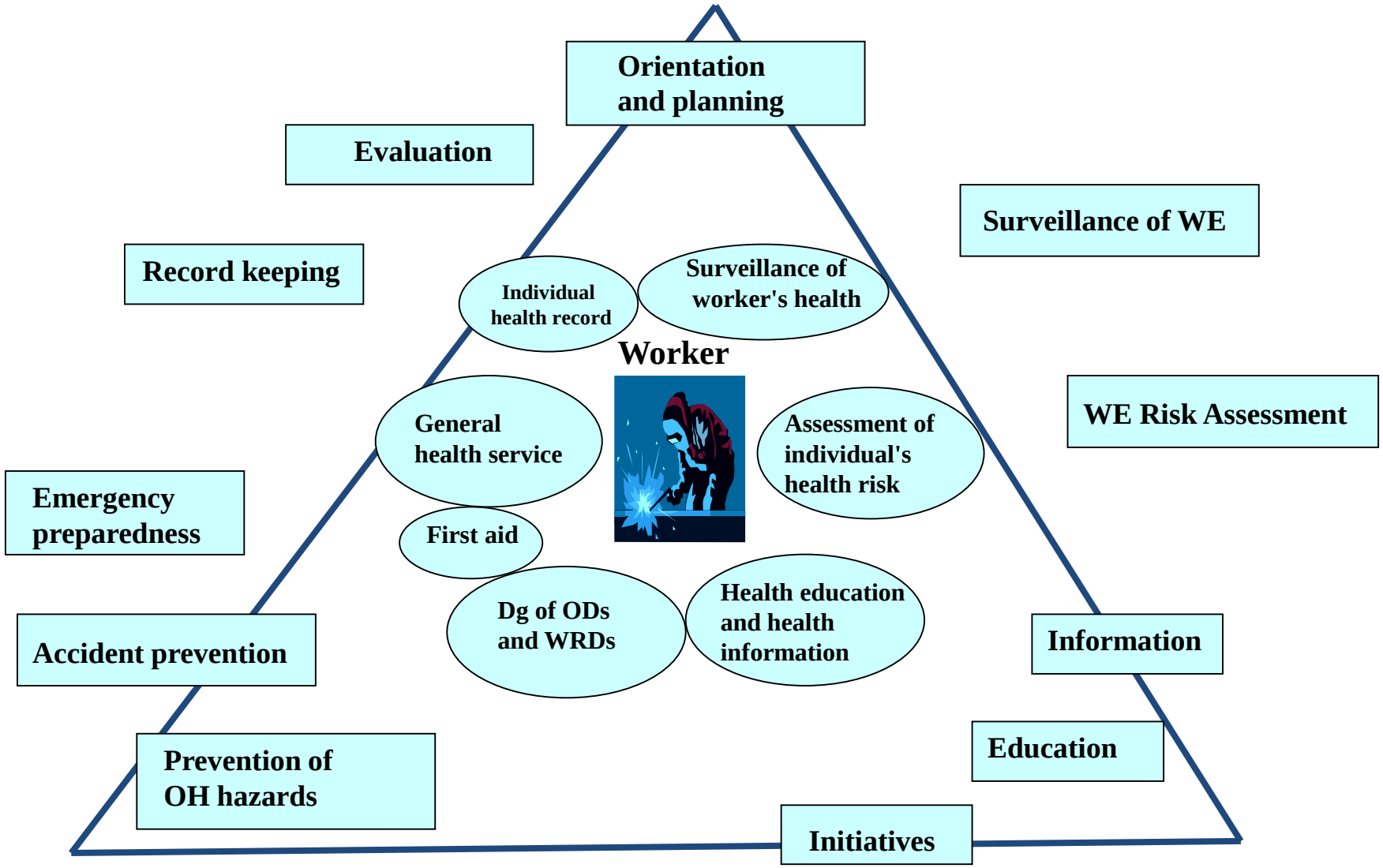
HEALTH

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity

OCCUPATIONAL HEALTH

Workplace health is a comprehensive and integrated approach to health which focuses on the general population at a workplace and the organization as a whole. It addresses a broad range of health issues including physical and psychosocial, environment, health practices, personal resources, etc. through programs, policies and practices.

Workers health



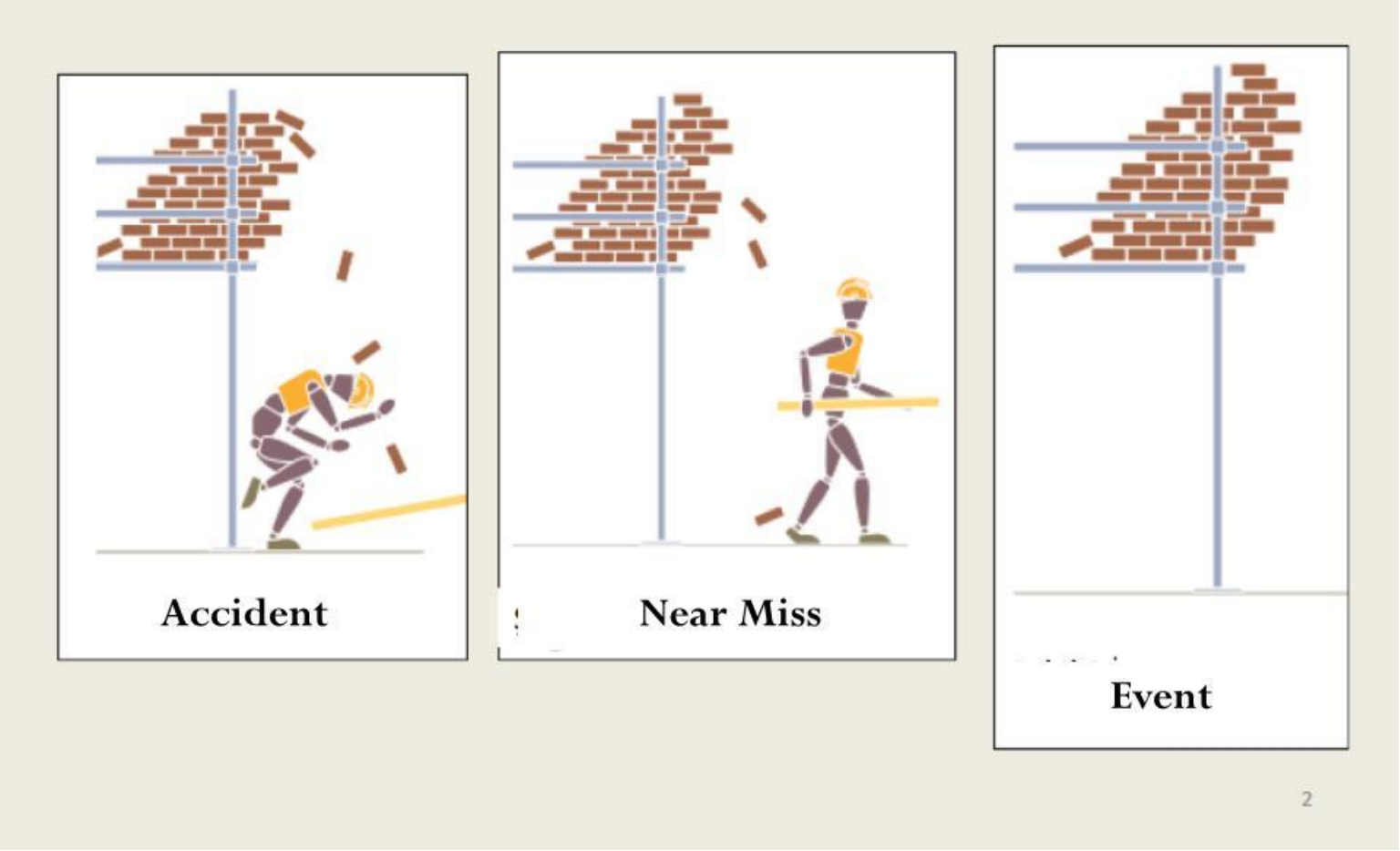
EVENT

Event

Accident

No loss, harm or damage

What is Event?



THE ACCIDENT- THE ACCIDENT STATISTICS – THE ACCIDENT PYRAMID

ACCIDENT

- The term "accident" can be defined as an unplanned event that interrupts the completion of an activity, and that may (or may not) include injury or property damage.
- An incident usually refers to an unexpected event that did not cause injury or damage this time but had the potential. **"Near miss"** or **"dangerous occurrence"** are also terms for an event that could have caused harm but did not.

An Accident is:

A. An unexpected and undesirable event, especially one resulting in damage or harm: car accidents on icy roads.

B. An unforeseen incident: A series of happy accidents led to his promotion

C. An instance of involuntary urination or defecation in one's clothing.

Lack of intention; chance: ran into an old friend by accident.

Logic A circumstance or attribute that is not essential to the nature something.

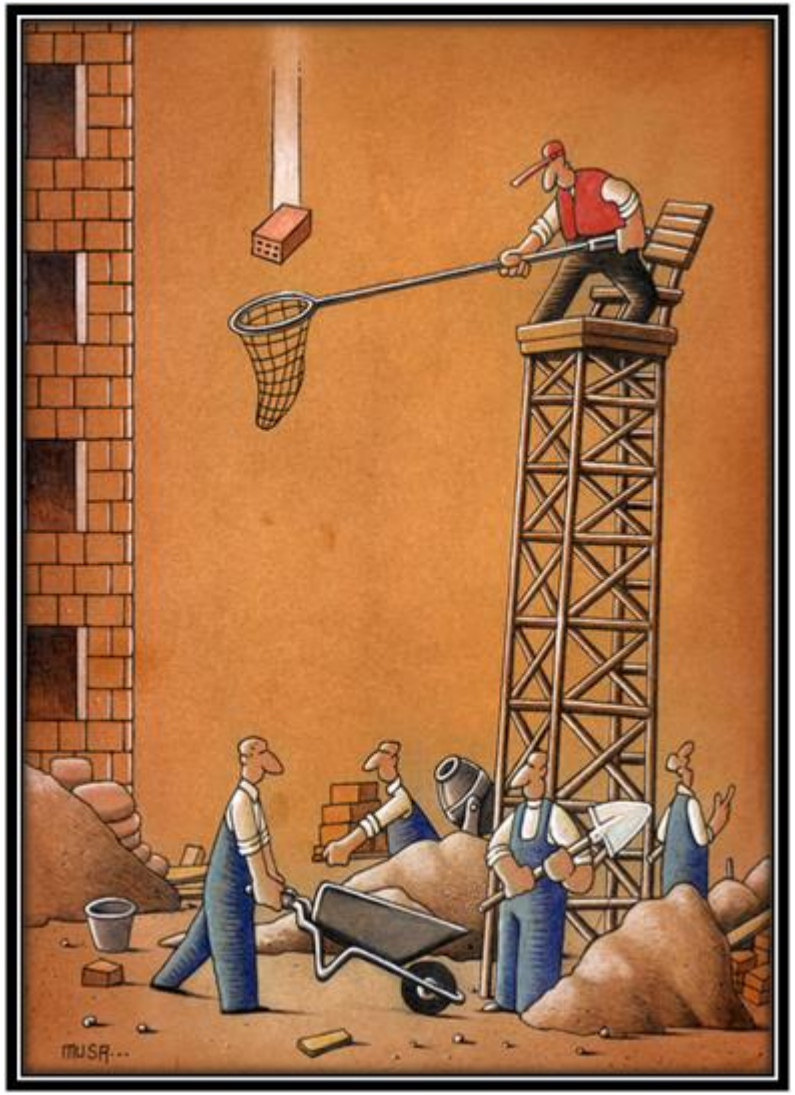
Occupational Accident (Definitions by ILO and WHO)

ILO (International Labour Organization)

- An unexpected or unforeseen event that leading to specific damage or injury.

WHO (World Helath Organization)

- It is an unplanned event that often lead to personal injury, damage to machinery, tools and equipment, and production stoppage for a while.



Accident

Near Miss (No Damage): It is the situation where there is no loss as a result, but the risk/risks are realized.

Minor Accidents: Small damage and first aid accidents with fewer working days.

More Serious Accidents: The accidents with more than 3 working days lost, leading to significant damage and requiring external treatment.

Work accident (5510 Social Insurance and Universal Health Insurance Law)

Work accident is the incident which occurs;

A. When the insurance holder is at the workplace,

B. (Amended: 17/4/2008 - 5754/8th Art.) due to the work carried out by the employer or by the insurance holder if he/she is working on behalf of own name and account,

C. For an insurance holder working under an employer, at times when he/she is not carrying out his/her main work due to the reason that he/she is sent on duty to another place out of the workplace,

Work accident (5510 Social Insurance and Universal Health Insurance Law)

Work accident is the incident which occurs;

D. (Amended: 17/4/2008 - 5754/8th Art.) for a nursing female insurance holder under item (a) of paragraph one of Article 4 of this Law, at times allocated for nursing her child as per labour legislation,

E. During insurance holder's going to or coming from the place, where the work is carried out, on a vehicle provided by the employer, and which causes, immediate or delayed, physical or mental handicap in the insurance holder.

FACTORS CAUSE ACCIDENTS

Normally three cause levels:

Most accidents are preventable by eliminating one or more causes.

- At the lowest level, an accident results only when a person or object receives an amount of energy or hazardous material that cannot be absorbed safely. This **energy or hazardous material is the DIRECT CAUSE** of the accident. **The direct cause is usually the result of one or more unsafe acts or unsafe conditions, or both.**
- **Unsafe acts and conditions are the INDIRECT (OR CONTRIBUTING) CAUSES** or symptoms. In turn, **indirect causes are usually traceable to poor management policies and decisions, or to personal or environmental factors.**

Accident Causing Factors

Basic Causes

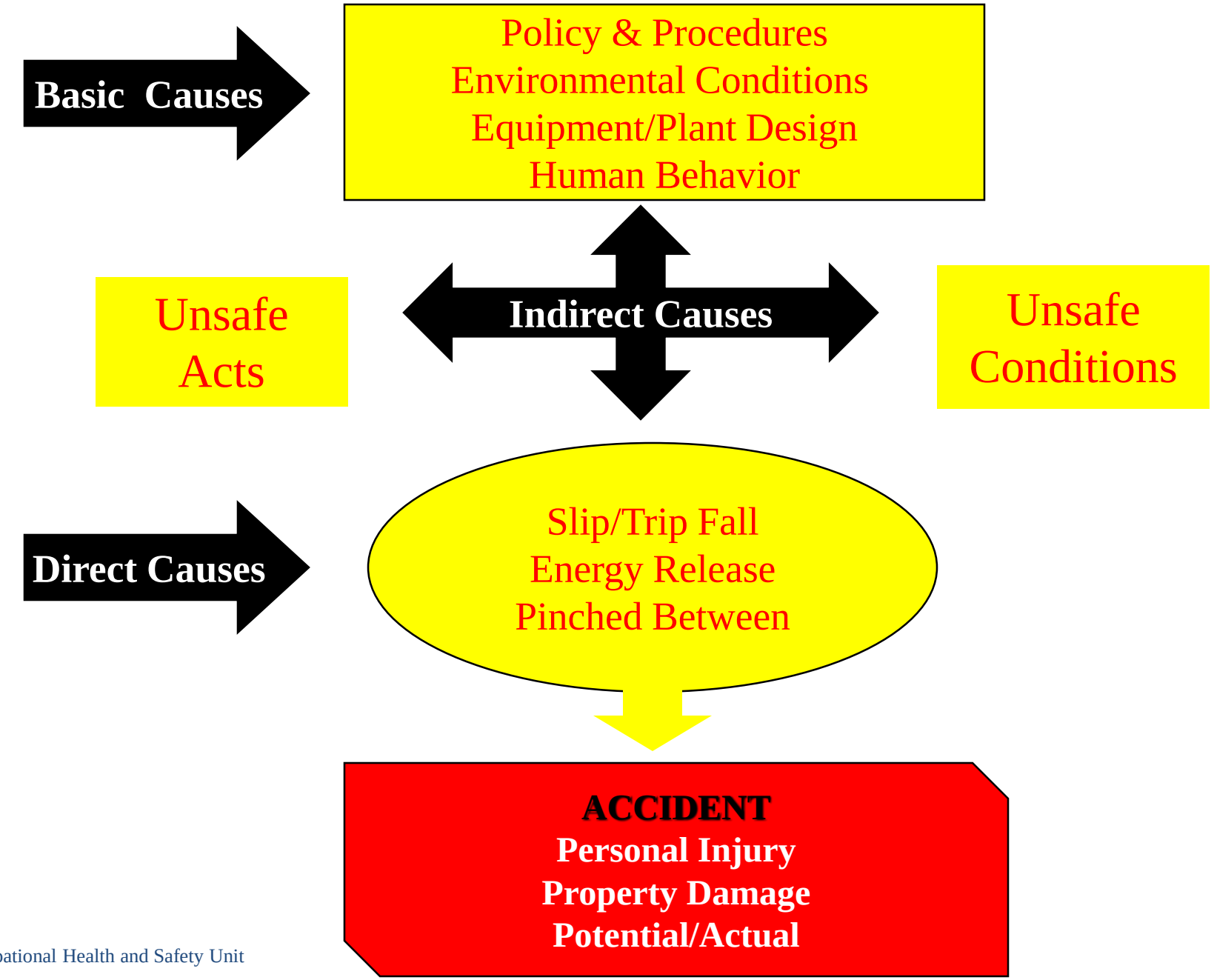
- ✓ Management
- ✓ Environmental
- ✓ Equipment
- ✓ Human Behavior

Indirect Causes

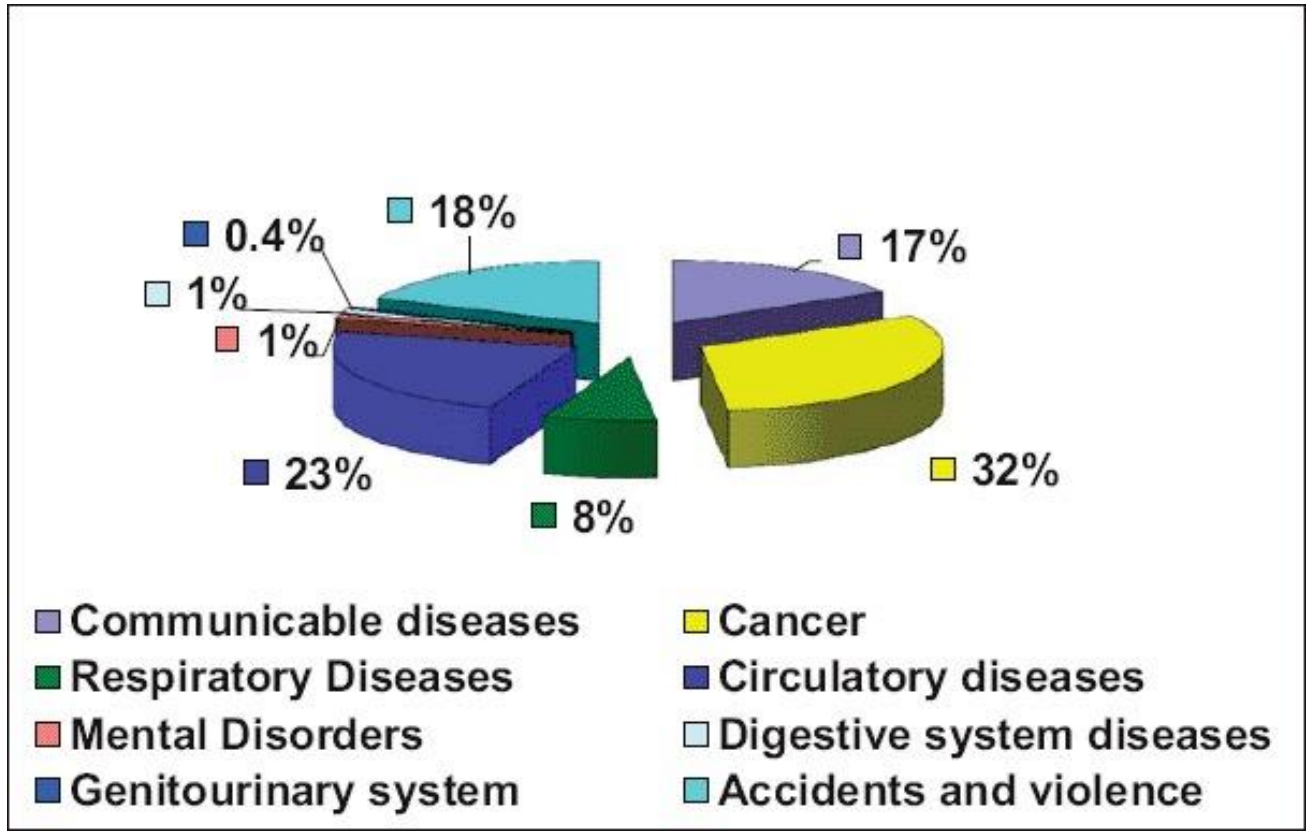
- ✓ Unsafe Acts
- ✓ Unsafe Conditions

Direct Causes

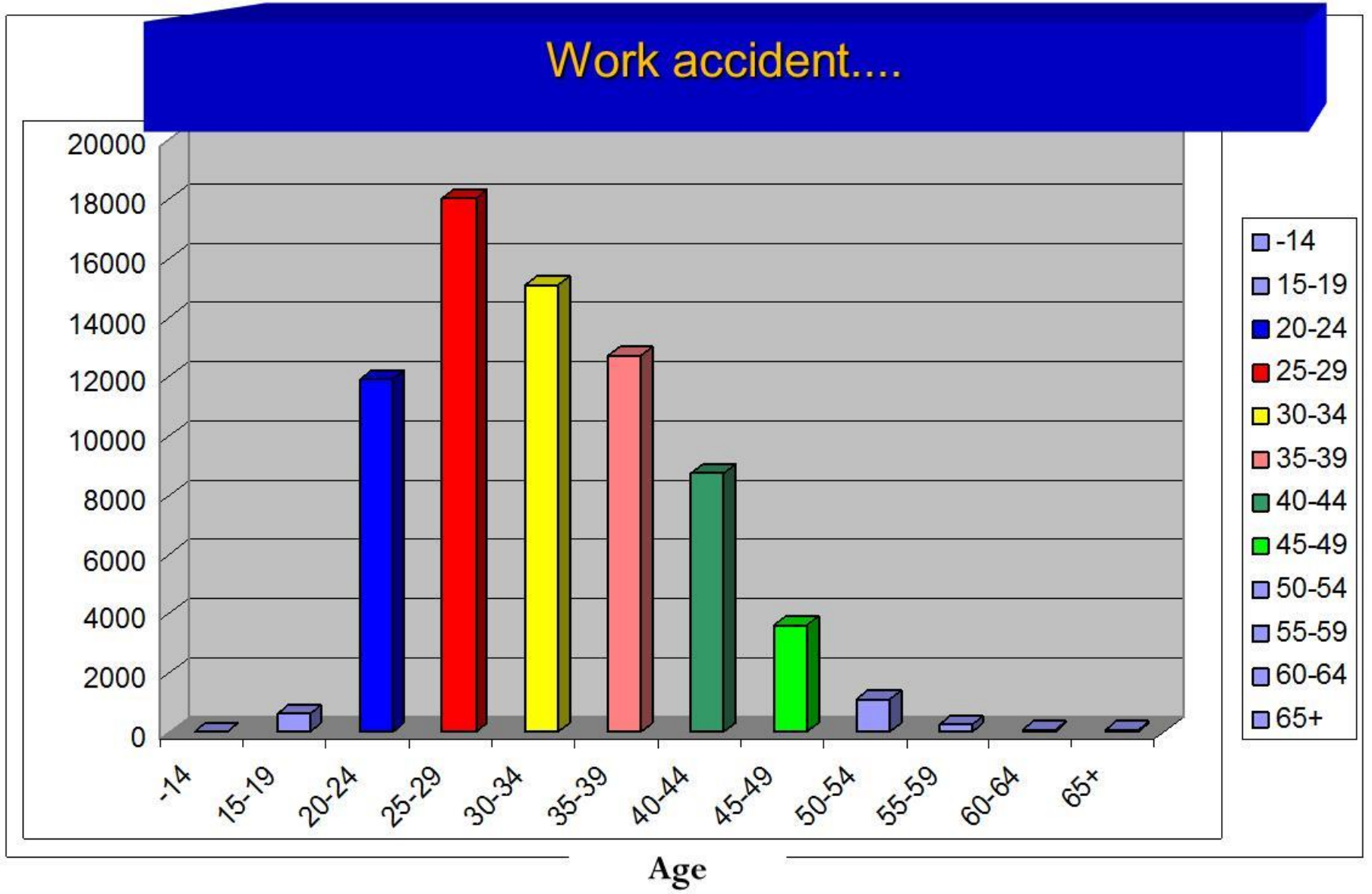
- ✓ Slips, Trips, Falls
- ✓ Caught In
- ✓ Run Over
- ✓ Chemical Exposure


Basic Causes
Policy & Procedures
Environmental Conditions
Equipment/Plant Design
Human Behavior
Unsafe Acts
Indirect Causes
Unsafe Conditions
Direct Causes
Slip/Trip Fall
Energy Release
Pinched Between
ACCIDENT
Personal Injury
Property Damage
Potential/Actual

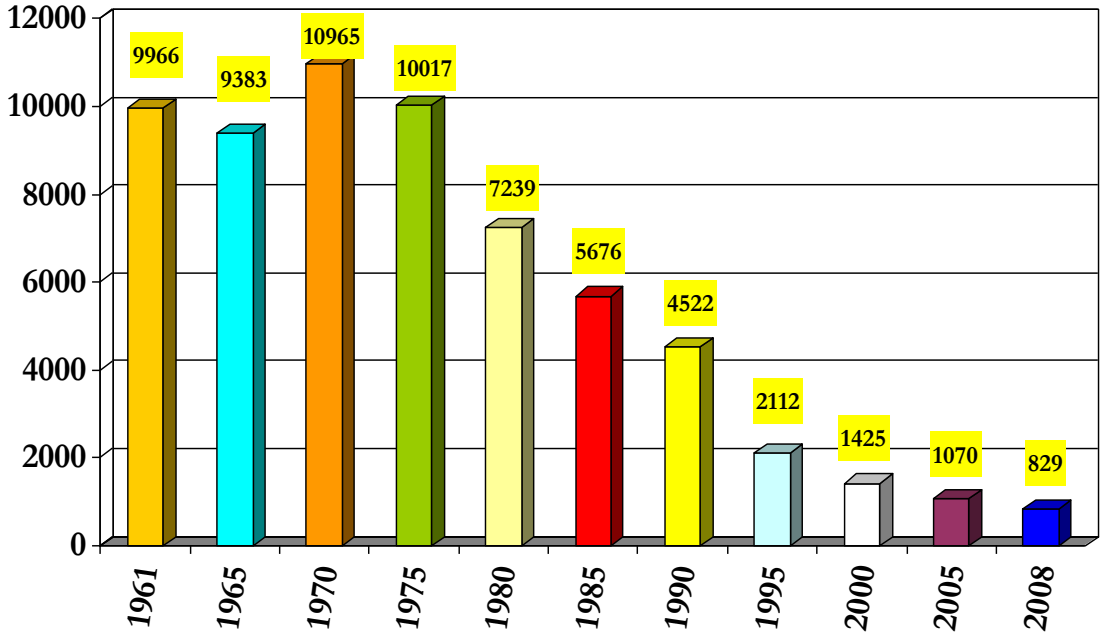
STATISTICS OF OCCUPATIONAL ACCIDENTS AND DISEASES



Work-related annual deaths – World (Sources: Hämäläinen P, Takala J, Saarela KL; TUT, ILO, EU-OSHA, 2008).

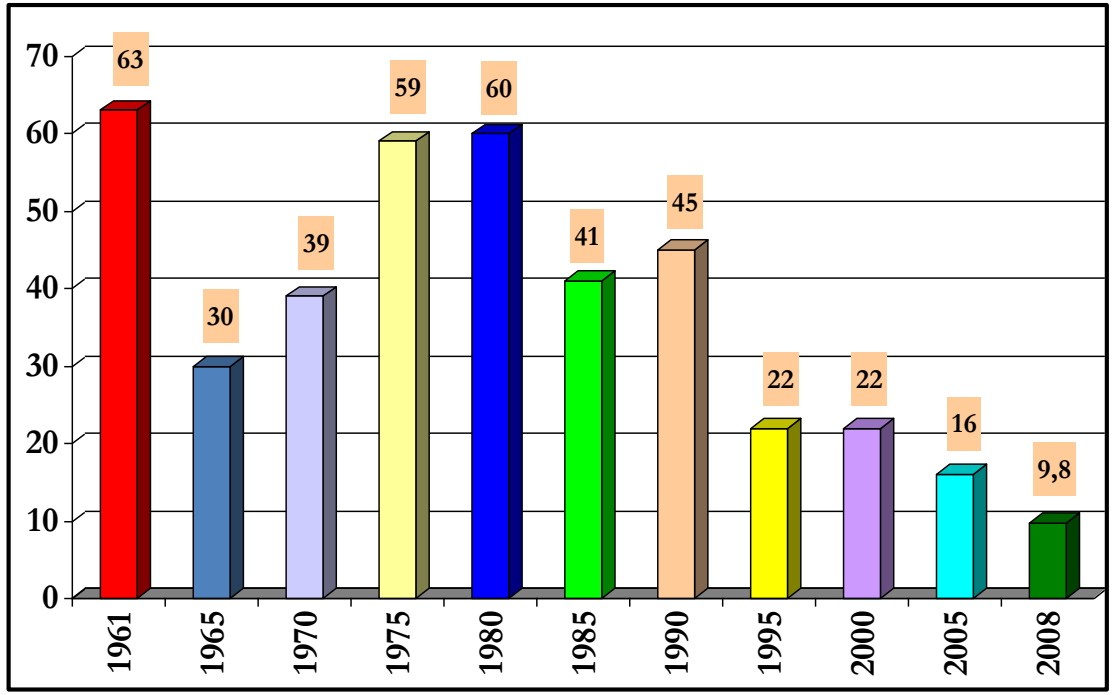

Work accident....
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65+
Age

STATISTICS OF OCCUPATIONAL ACCIDENTS AND DISEASES



Source : Social Insurance Institution

Number of occupational accidents / 100.000



Source : Social Insurance Institution

Number of fatal occupational accidents and diseases / 100.000

WHO LOOSE DUE TO THE OCCUPATIONAL ACCIDENTS?

1.Worker

- Suffer
- Loss of income
- Losing your job
- Treatment costs
- Familial troubles

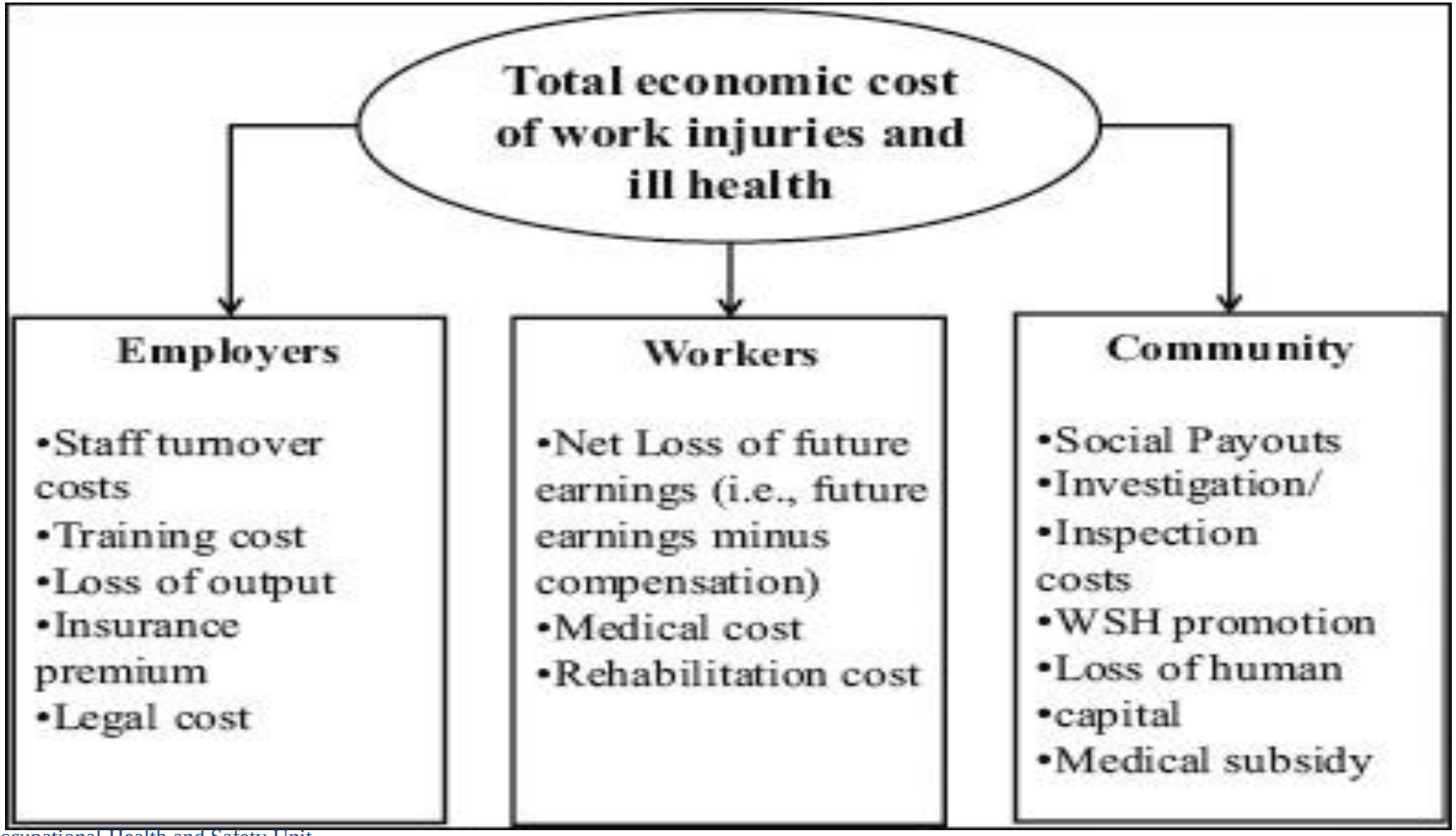
2.Employer

- Financial costs
- Physical effects of the accidents on the employees
- Hasar gören ekipmanın tamiri / yenilenmesi
- Cost of accident investigation time
- Production stopping

3. Country Economy

4. Society

Cost items borne by employers, workers, and the community



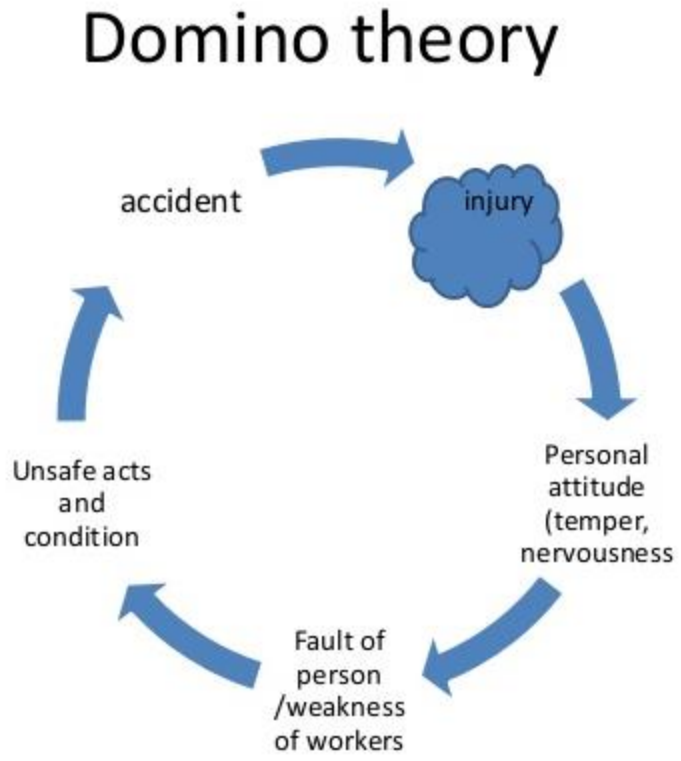
WORKPLACE ACCIDENT ICEBERG EFFECT

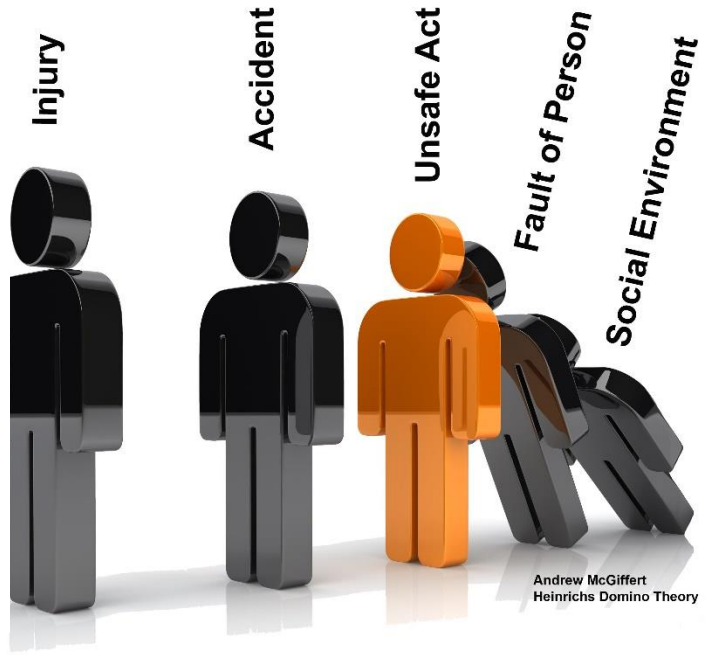
- Any accident at work results in both direct and inderct costs which are represented by the diagram.
- **Direct Costs** tend to be the ones that we think of first
- **İndirect Costs** may be those that are less obvious but, as you can see from the diagram, they account for more of the overall cost of an accident than the direct costs

DOMINO APPROACH

Heinrich's key factors in the domino sequence of events leading to an injury are shown below:

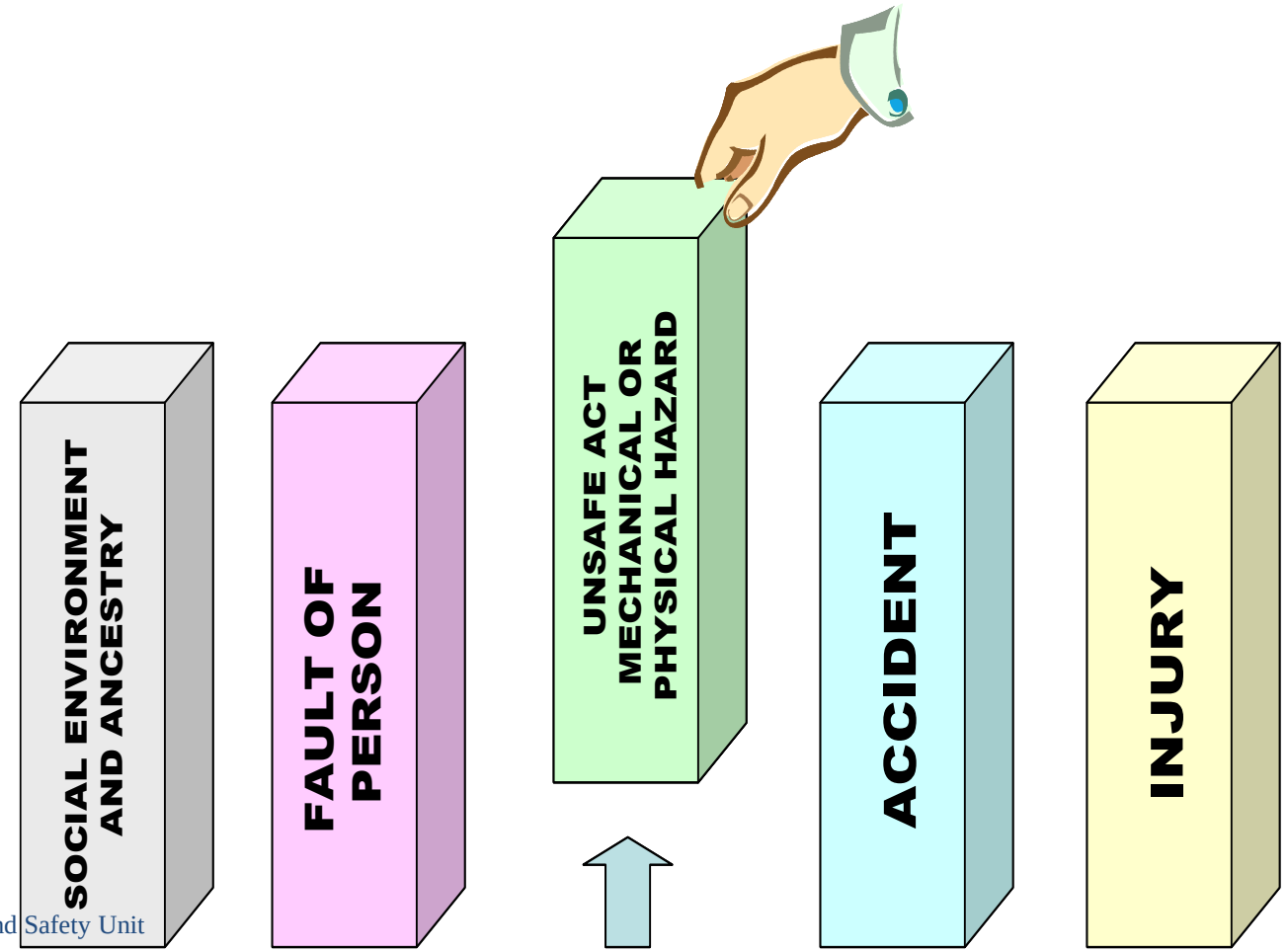
1. Social environment;
2. Fault of the person;
3. Unsafe acts or conditions;
4. Accident;
5. Injury.





Domino Approach….

- Unsafe act and mechanical hazard constitute the central factor in the accident sequence



Domino Teorisi

The main working area of Occupational Health and Safety should be aimed at eliminating dangerous situations and dangerous behavior.

Many accidents are caused by unsafe behavior.

The magnitude of the damage resulting from the accident cannot be predicted.

1- 29 – 300 Ratio: On the basis of every fatal accident, there are 29 minor injuries and 300 non-injury events.

Investigating the causes of dangerous behaviors can serve as helpful guides in choosing the right behavior.

Domino Teorisi

In order to prevent accidents, starting with engineering measures, other measures should be taken in order.

The methods of preventing accidents and the methods used in the enterprises to increase the quality and efficiency show parallelism.

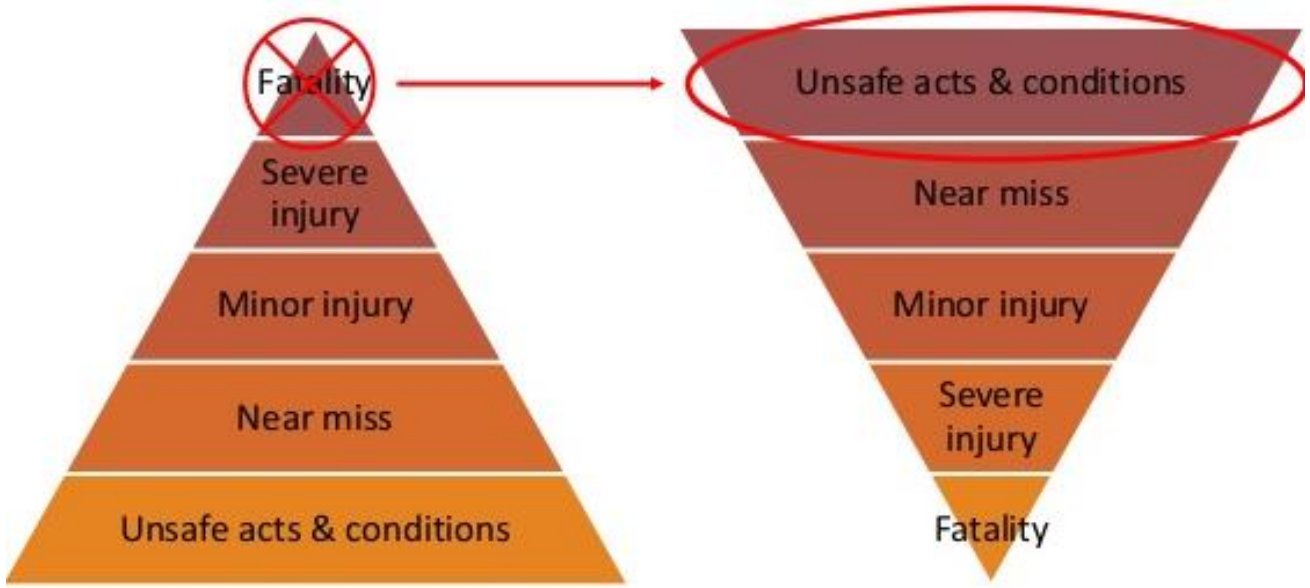
Top management should take responsibility for safety, managers should also participate in the work.

First-level managers are very important in OHS.

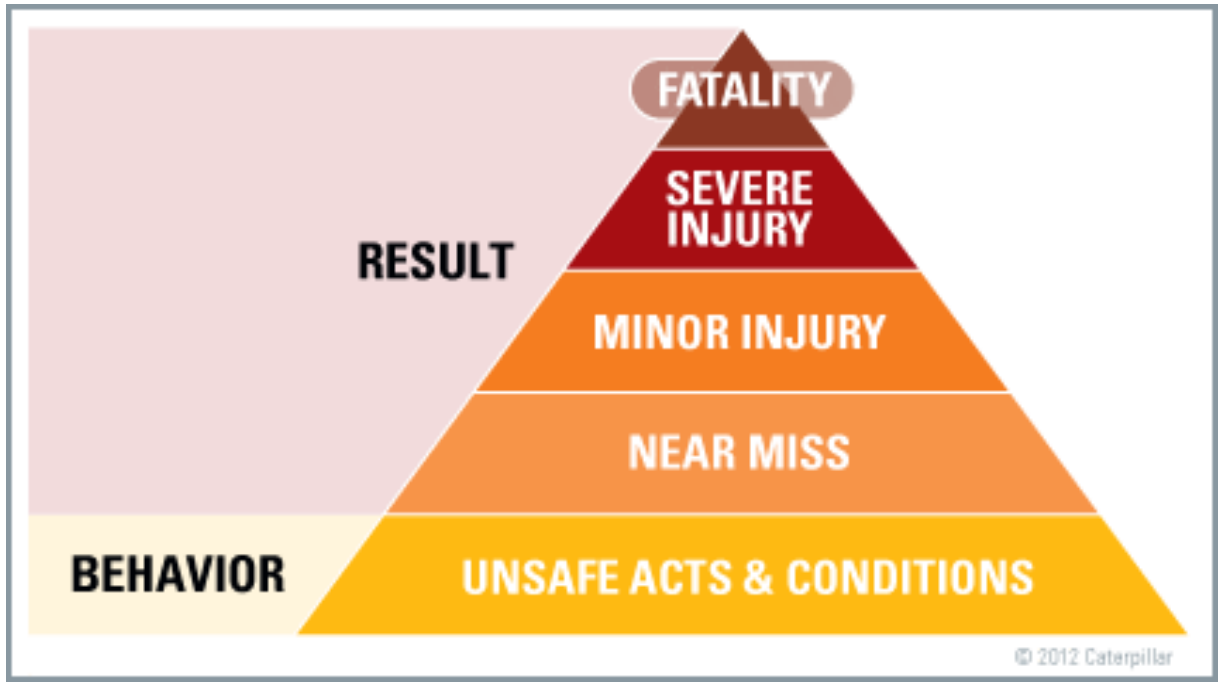
Human feelings should guide the work related to OHS. Thus, improvements made in the field of OHS will also affect quality and productivity.

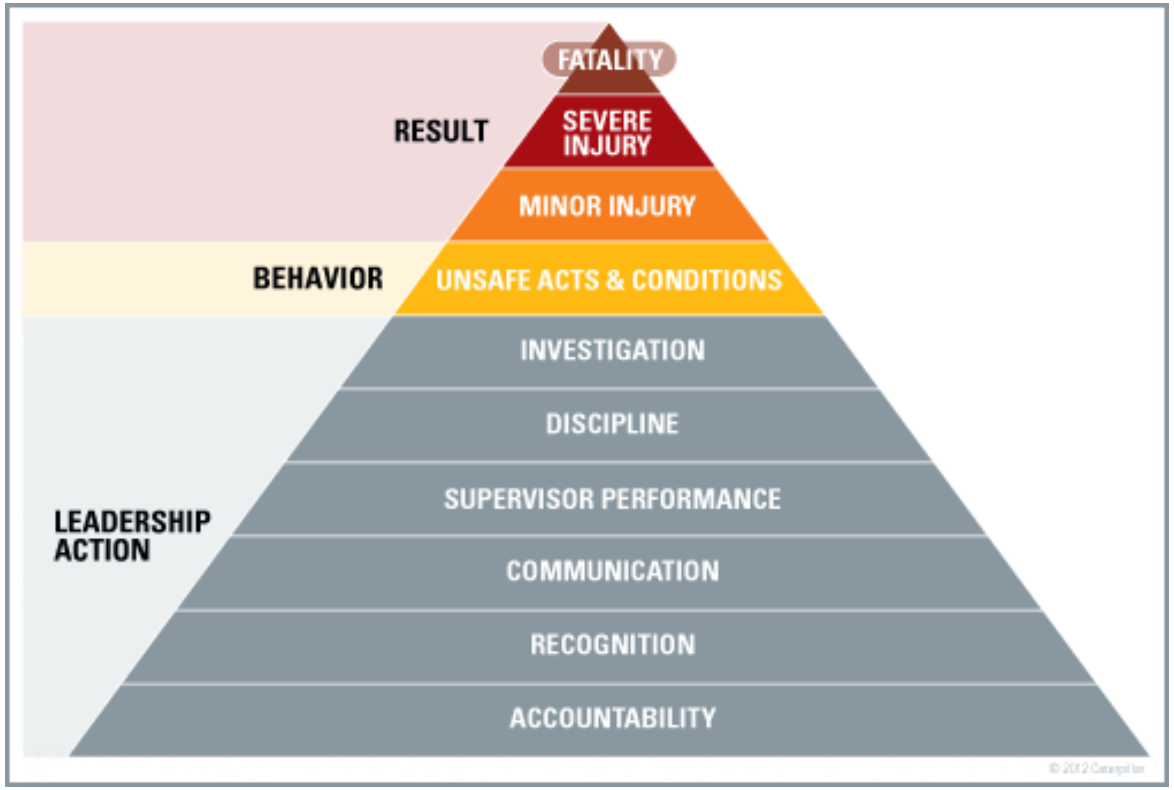
ACCIDENT PYRAMID

- H. W. Heinrich changed the world of safety fundamentals forever with his pioneering work in the 1930's. One of his concepts that continues to make me think is his accident triangle (pyramid), a concept that we all are familiar with.

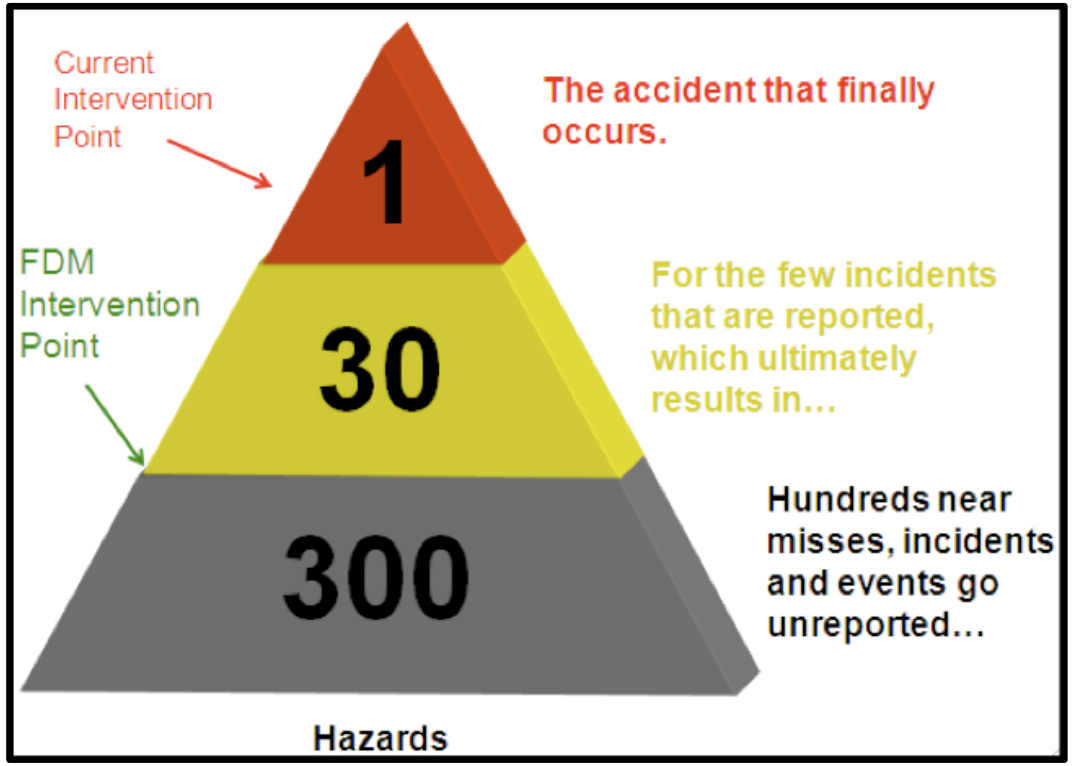


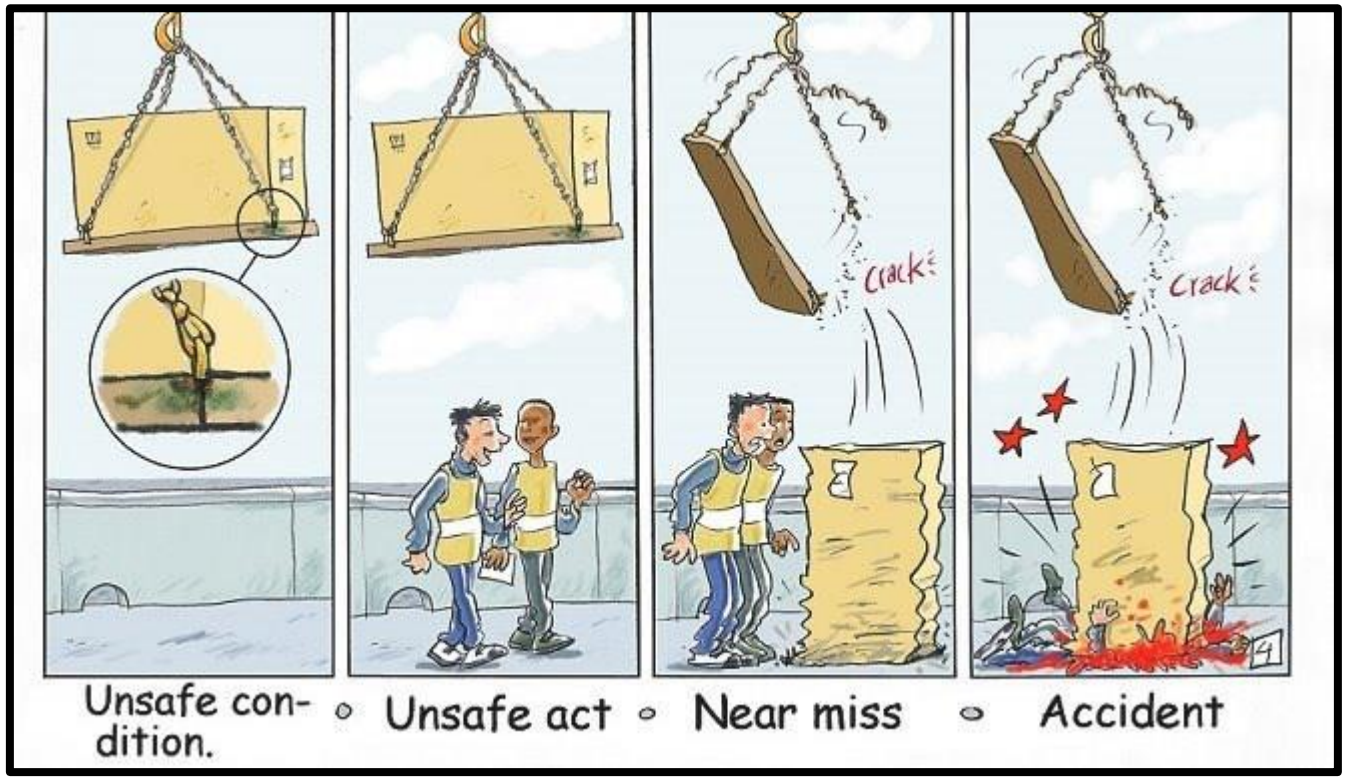
Accident Pyramid





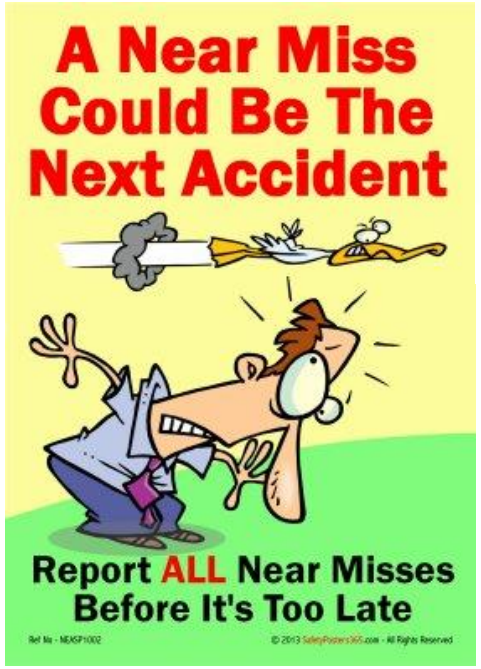
Accident Pyramid

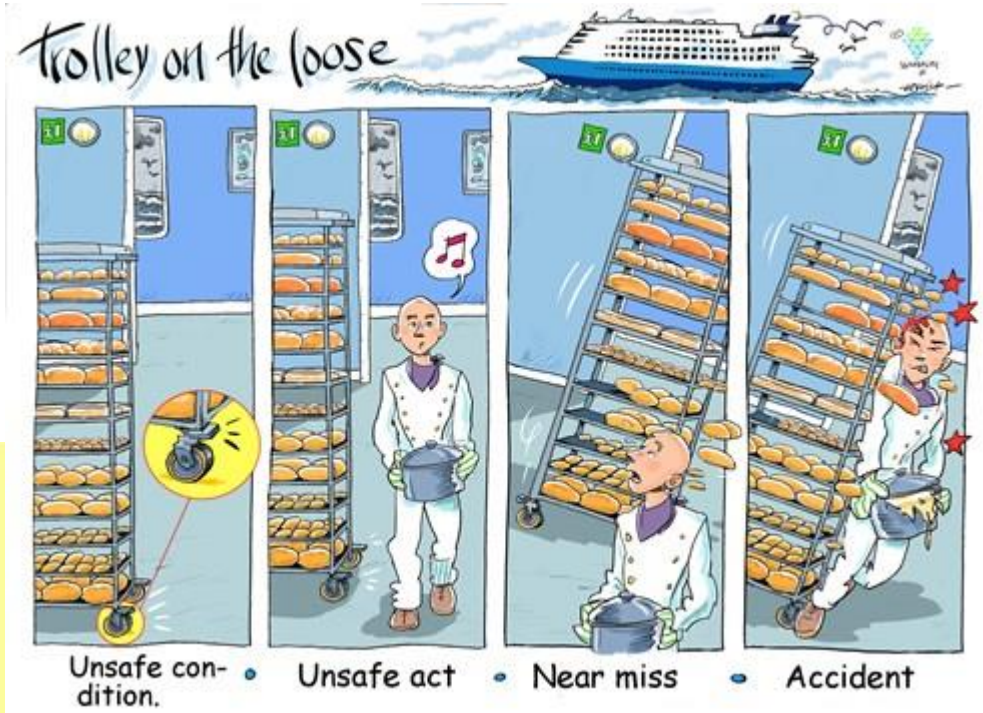




THE ACCIDENT - NEAR-MISS

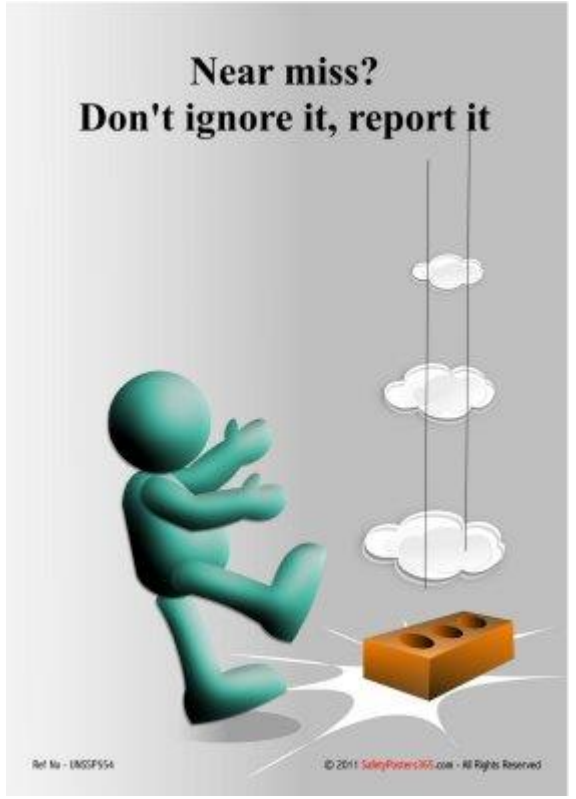
- Also know as a "Near Hit"
- An accident that does not quite result in injury or damage (but could have)
- Remember, a near-miss is just as serious as an accident!





Near-Miss

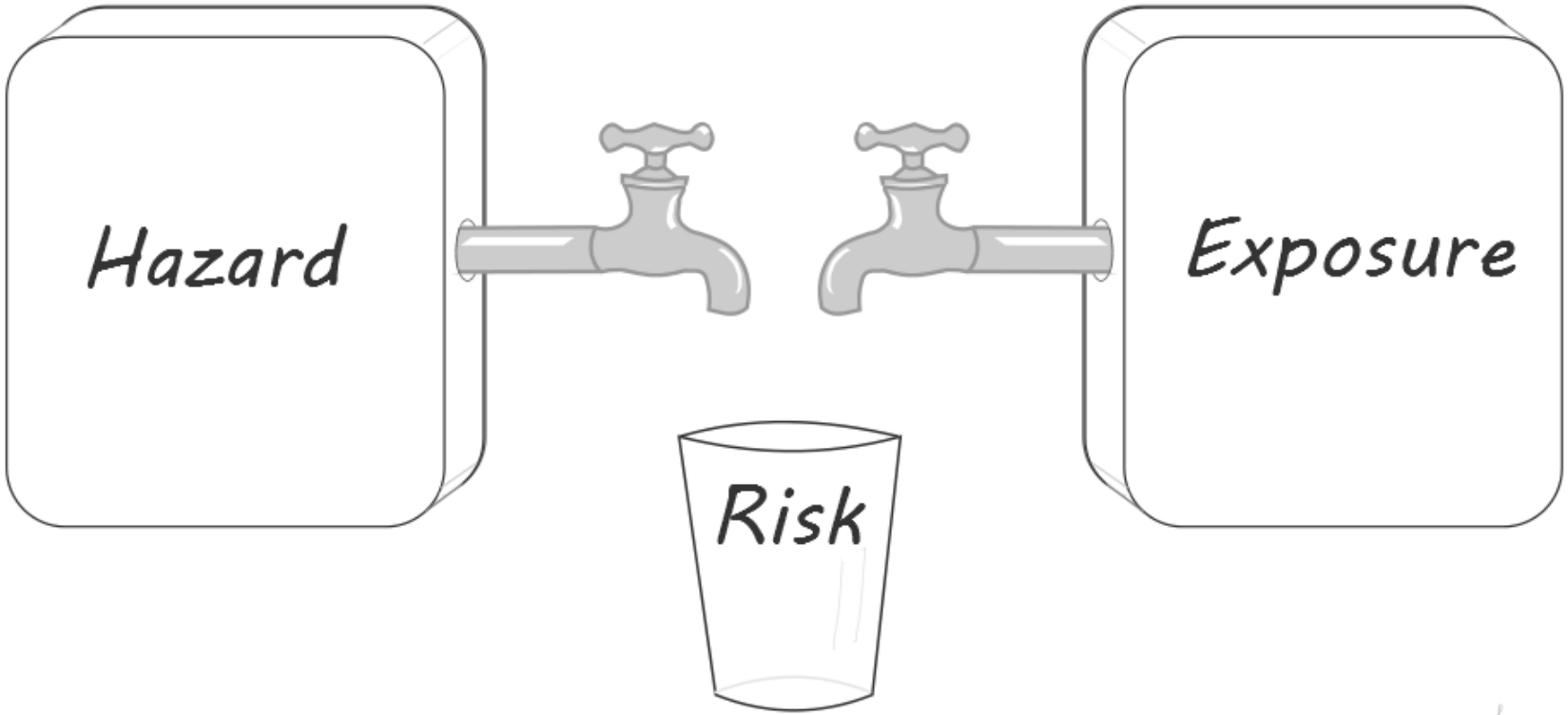
A ***near miss:*** is an unplanned event that did not result in injury, illness, or damage – but had the potential to do so. Only a fortunate break in the chain of events prevented an injury, fatality or damage; in other words, a miss that was nonetheless very near.



The phrase "**near miss**" should not to be confused with the phrases "**nearly a miss**" or "**they nearly missed**" which would imply a collision. Synonymous phrases to "**near miss**" are "**close call**", or "**nearly a collision**".

Video-1

HAZARD AND RISK



HAZARD

Hazard: potential which exists at the workplace or may arise from outside the workplace to cause harm or damage which could affect the worker or the workplace;

A *hazard* is any situation, substance, activity, event, or environment that could potentially cause injury or ill health (OHSAS 18001)

Hazard

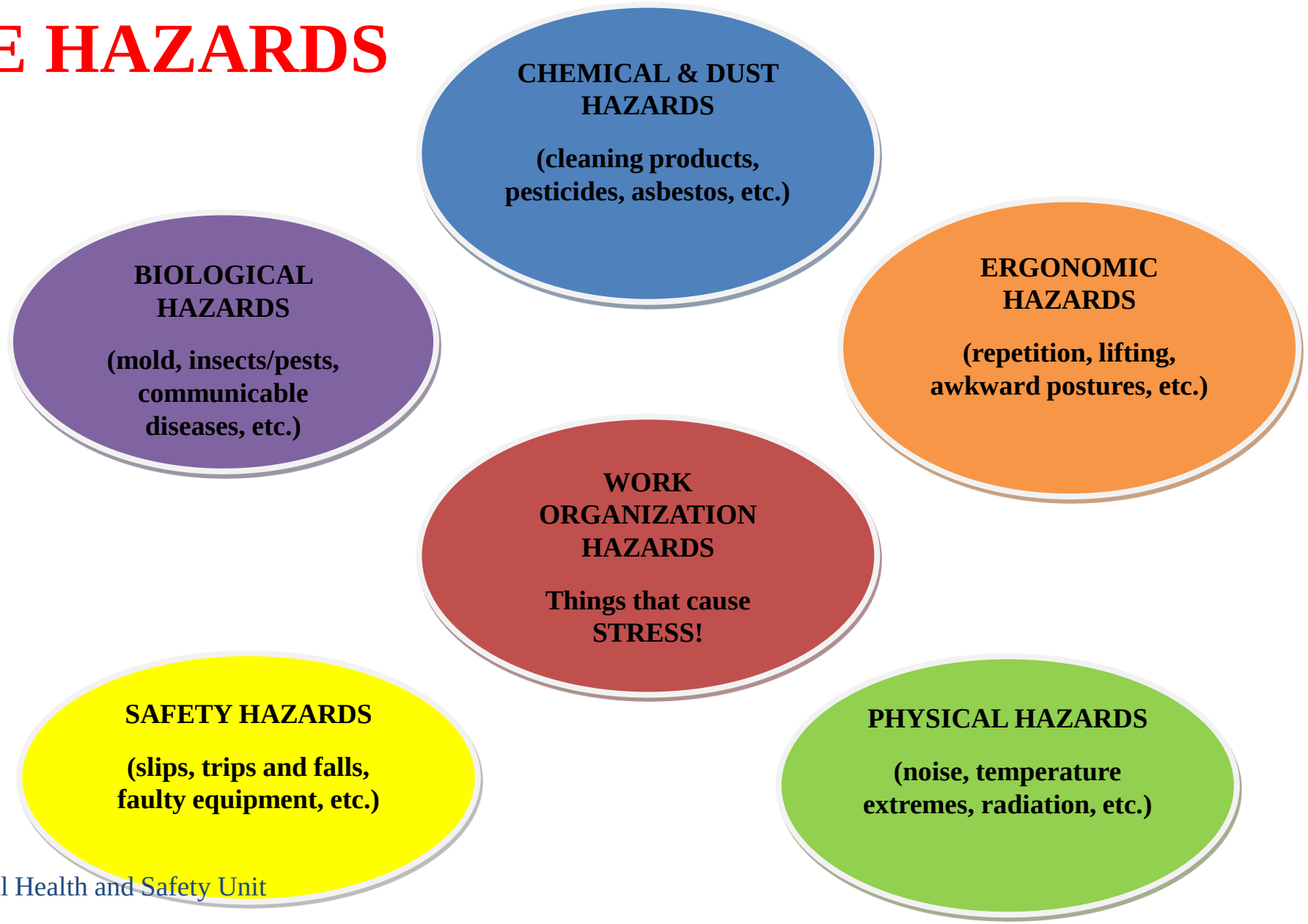
Example situations that may be caused by a near-miss event or accident that may occur as a result of hazards in the workplace:

- A Spill on the Floor
- Broken Equipment

WHY WORRY ABOUT HAZARDS?

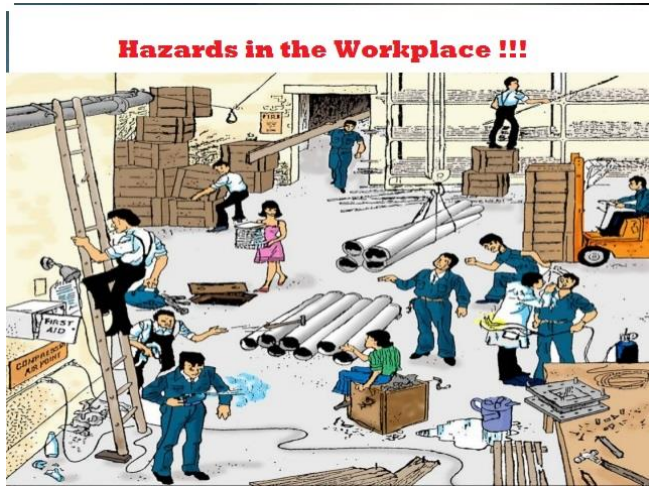
- ✓ It costs time and money to retrain a new worker
- ✓ New workers are not initially as productive as more experienced workers
- ✓ Goods or equipment can be lost in the accident, costing the enterprise $ to replace it
- ✓ Other workers will feel afraid or unhappy to be working in a place which could injure or kill them
- ✓ It harms productivity.

WORKPLACE HAZARDS



Examples of unsafe work practices commonly found in the workplace include…

- Using machinery or tools without authority
- Operating at unsafe speeds or in violation of safe work practices
- Removing or disabling guards or other safety devices on machinery or equipment
- Using defective tools or equipment or using tools or equipment in unsafe ways
- Repairing or adjusting equipment that is in motion, under pressure, or electrically charged



REPORT HAZARDS IMMEDIATELY

Ever person in a workplace **shares responsibility** for ensuring that their work environment is safe and healthy.

Some hazards pose an immediate danger and others take a longer time to become apparent. But both types of hazards must be fixed.

If you are aware of a hazard in your workplace, you should report it promptly to your supervisor, employer or health and safety representative.

Once a hazard has been identified, your employer and/or supervisor has a duty to assess the problem and eliminate any hazard that could injure workers.

Identifying and reporting hazards

- There are several ways to identify hazards in the workplace, including:
  - ✓ Inspections and audits,
  - ✓ Hazard reports,
  - ✓ Job analysis,
  - ✓ Health monitoring data,
  - ✓ Material safety data sheets,
  - ✓ Workplace environment monitoring data.

RISK

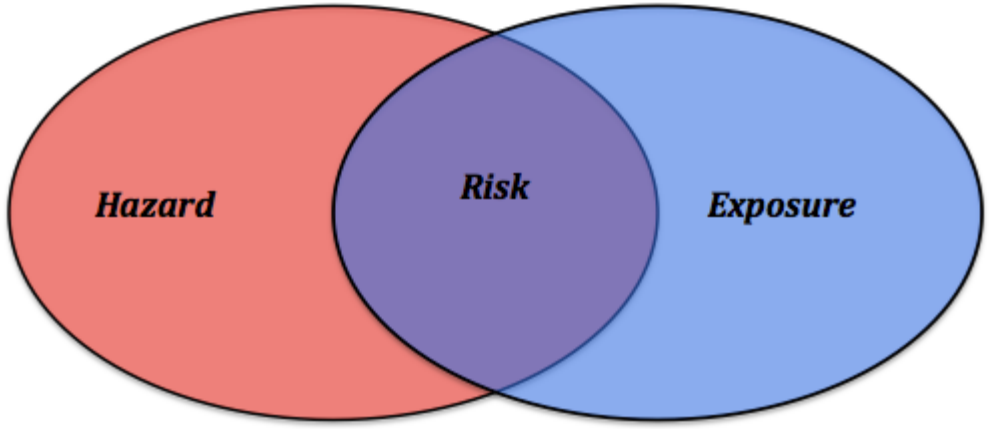
- ***Risk*** combines three elements: it starts with a ***potential event***, and then combines its ***probability*** with its ***potential severity***. In the context of OH&S, the concept of risk asks two future oriented questions:

I. What is the ***probability*** that a particular hazardous event or exposure will actually occur in the future?

II. How ***severe*** would the impact on health and safety be if the hazardous event or exposure actually occurred?

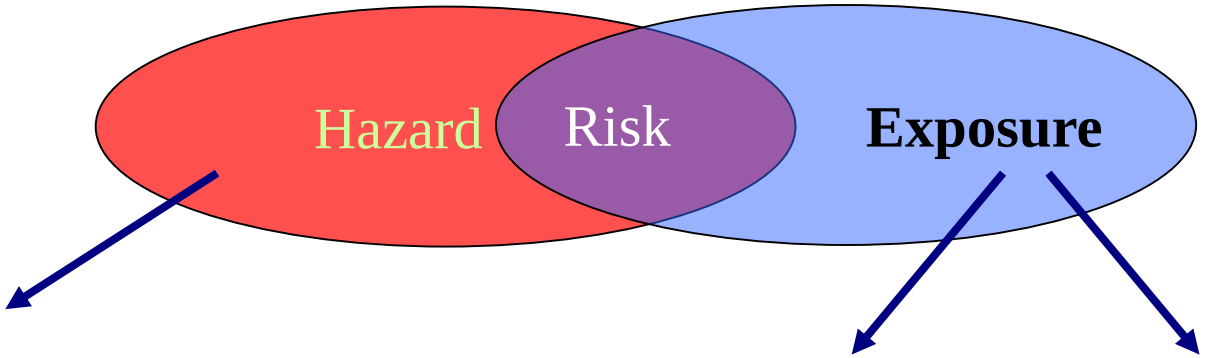
Risk

- A measure of the probability and severity of a hazard to harm human health, property, or the environment
- A measure of how likely harm is to occur and an indication of how serious the harm might be



Risk ≠ 0

Assessment of the risk of exposure by inhalation



- F-Chem properties
- Toxicol. properties
- Physical form
  - label
  - MSDS
  - **Limit Value**
  - others

Concentration

- volatility or dustiness
- form of use
- quantity used
- control measures

Time

- duration
- frequency

Risk

RISK ASSESSMENT

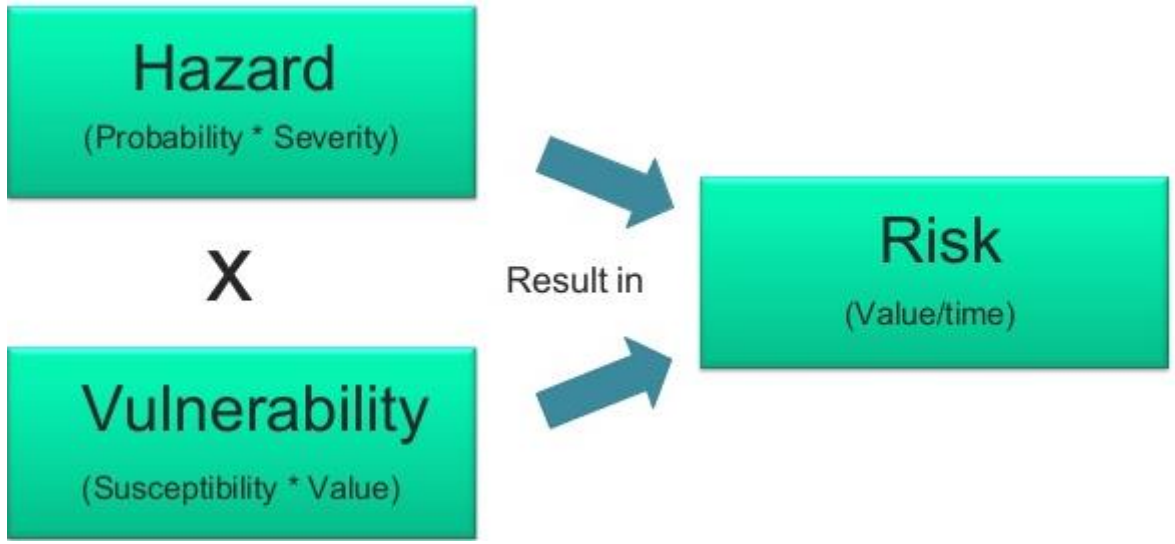
- ✓ Overall process of estimating the magnitude of risk and deciding whether or not the risk is tolerable

SAFETY

- ✓ Freedom from unacceptable risk of harm

TOLERABLE RISK

- ✓ Risk that has Commitmentd to a level that can be endured by the organization having regard to its legal obligations an its own OH&S policy

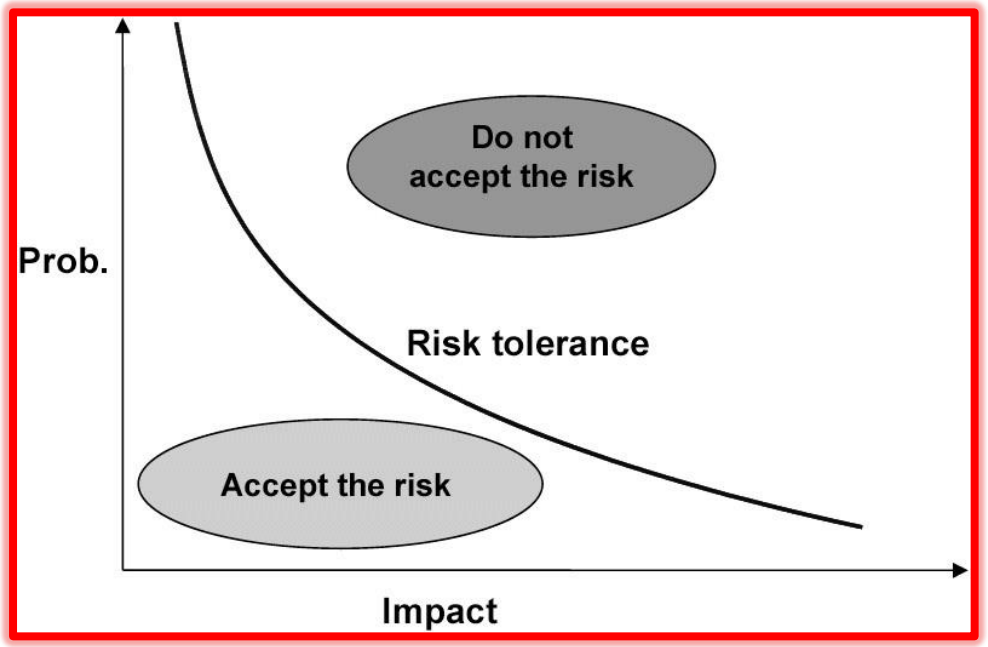


ACCEPTABLE RISK

A ***risk is acceptable*** if it has been reduced to a level that your organization can tolerate given its occupational health and safety (OH&S) policy and its legal obligations.

Risks:

- Noticeable
- Learnable
- Defensible
- Measurable
- Analysable



BASIC STEPS IN A RISK ASSESSMENT

Basic steps in a risk assessment can be identified as:

1. Identifying hazards
2. Assessing the risks
3. Assessing existing control measures to check whether they are adequate
4. Assessing if extra controls are needed
5. Reviewing later on, to see if the controls are working

WHO IS AT RISK?

- Workers
- Visitors
- Contractors
- Others
  - ✓ Members of Public
  - ✓ Passers-by
  - ✓ Neighbors

Primary Risk Factors

Repetitive Movements

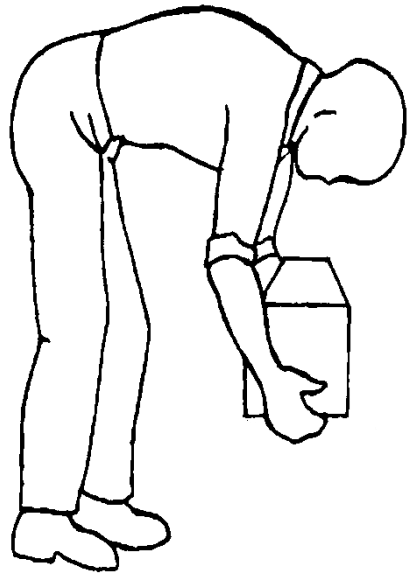
- Leading cause of MSDs
- Same joints /muscle groups (keyboarding, mousing)

Forceful Movements

- Excessive movements for long periods of time (e.g. extended reach)

Fixed or Awkward Postures

- Cause fatigue (sitting rigidly for long periods; reaching above shoulder)



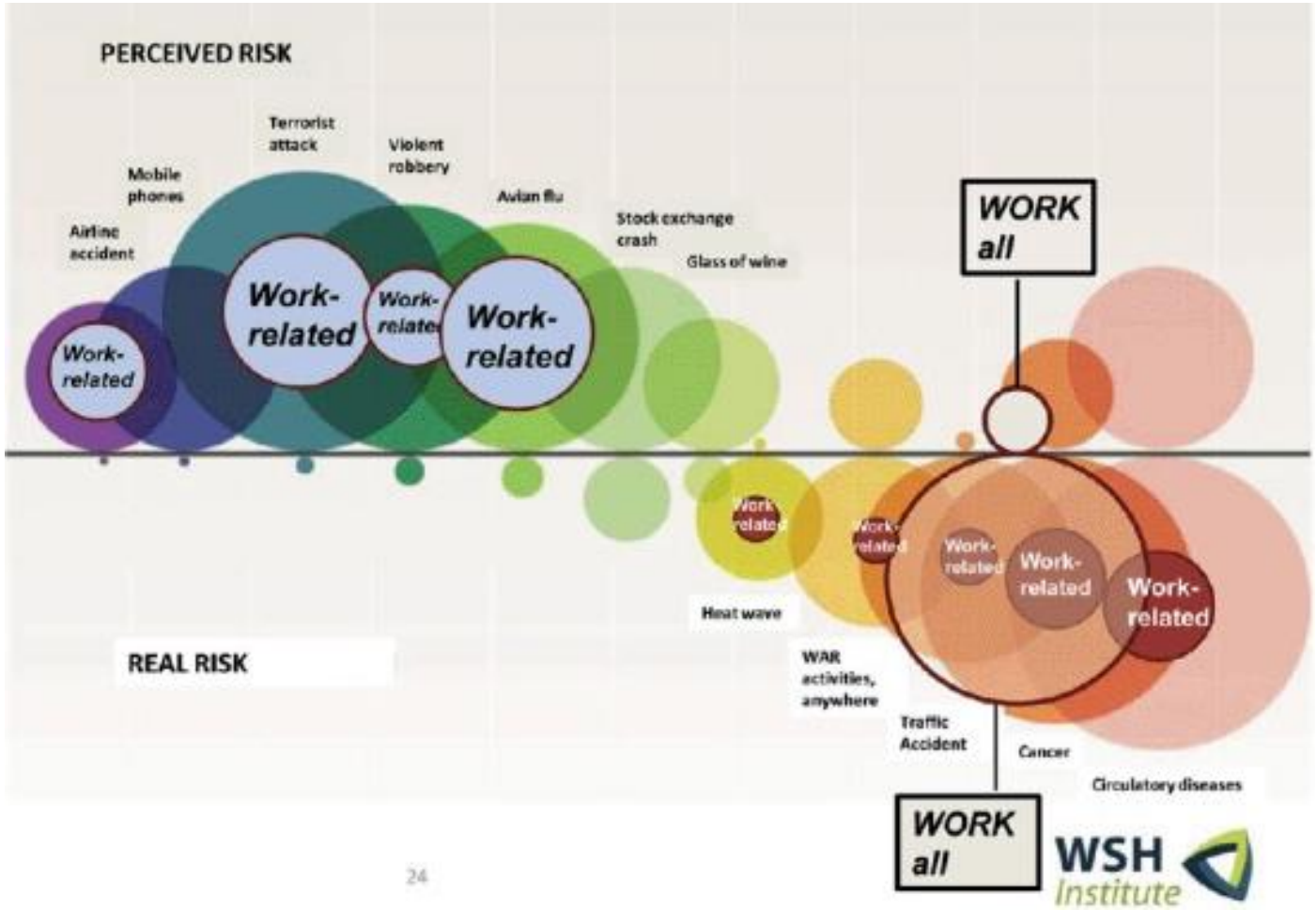
Bending, Twisting and Heavy Lifting

Secondary Risk Factors

- Contact Pressure (holding tools, stapling, resting wrists while typing)
- Cold Exposure (working outside)
- Infrequent, heavy lifting (picking up a water jug; box of paper for photocopier)

Frequency and Duration are key

PERCEIVED RISK - REAL RISK



Perceptions of people are different from reality (Sources: S. Hertlich, M. Hamilo, S. Kuvalehti [FI], WHO/ILO/J.Takala).

HAZARD AND RISK

SAFETY AND CONTROL IN THE WORKPLACE

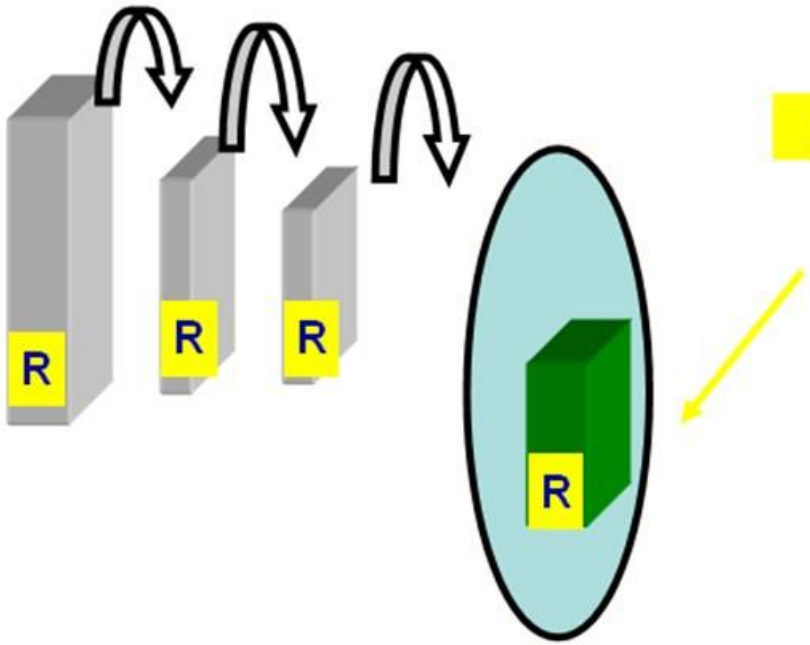
SAFETY

FREEDOM FROM DANGER OR HARM

Nothing is Free of

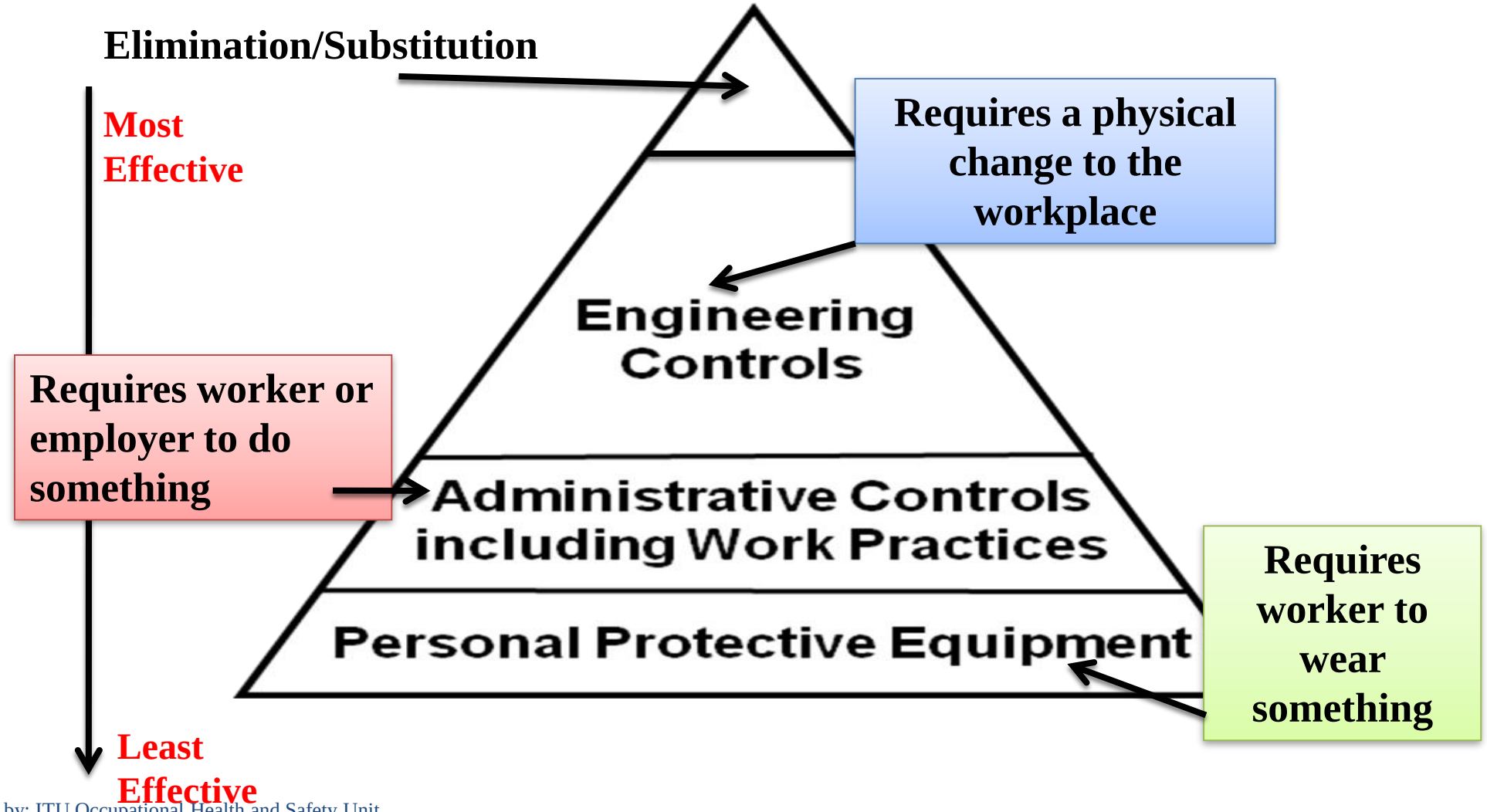
BUT - We can almost always make something SAFER

Safety Is Better Defined As….

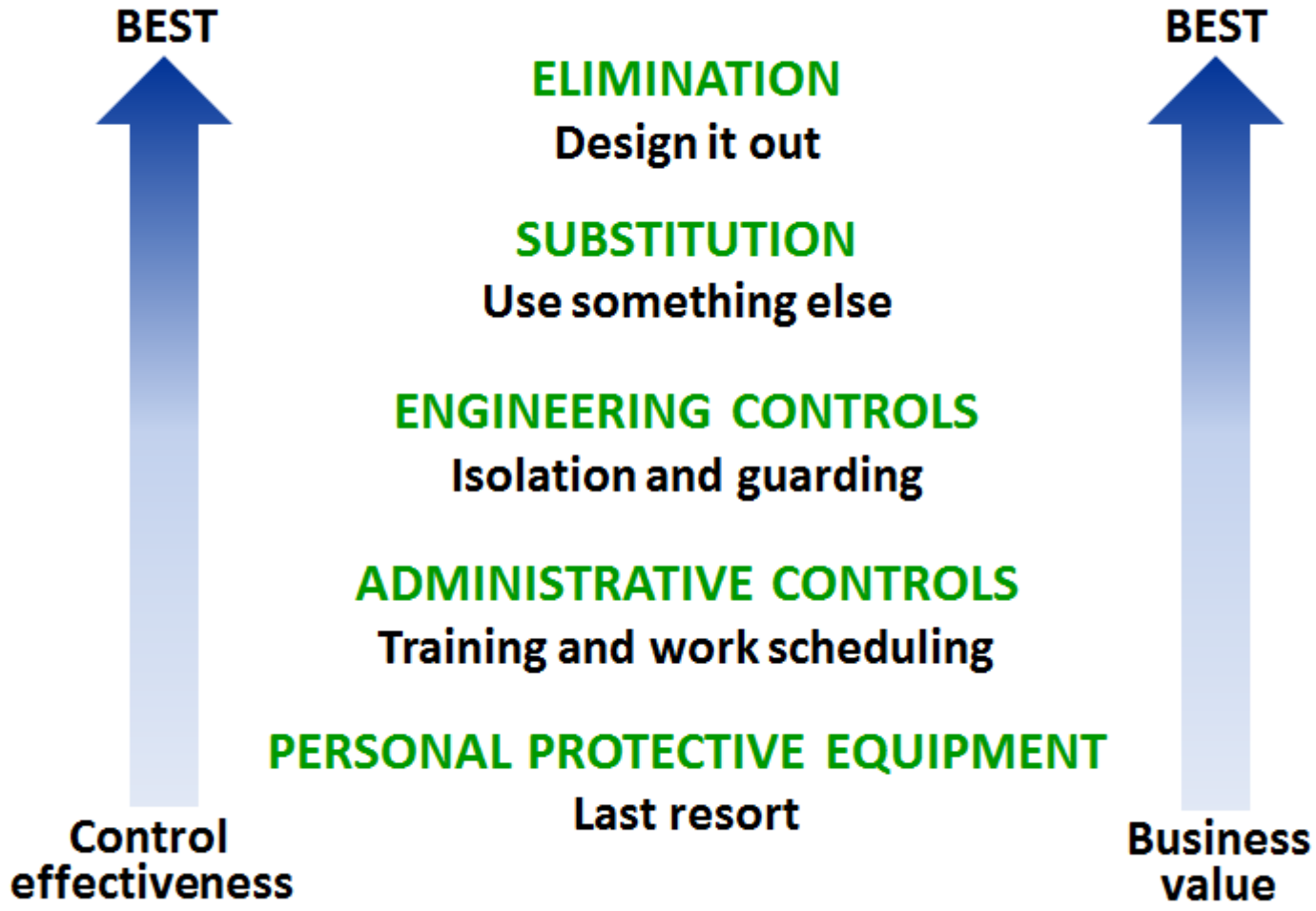


ACCEPTABLE RISK

HIERARCHY OF CONTROLS



Hierarchy of Controls



CONTROLS : Engineering

CONTROL AT THE SOURCE!
Limits the hazard but doesn't entirely remove it.

Proper equipment

Other Examples:
Mechanical Guards
Wet Methods for Dust
Enclosures/Isolation
Dilution Ventilation

Re-designed Tools

Local Exhaust

CONTROLS: Administrative

Aimed at **Reducing Employee Exposure** to Hazards !!!

- Changes in work procedures such as:
  - Written safety policies/rules

- Schedule changes, such as:
  - Lengthened or Additional Rest Breaks
  - Job Rotation
  - Adjusting the Work Pace

- Training with the goal of reducing the duration, frequency and severity of exposure to hazards

CONTROLS: Personal Protective Equipment - PPE

Control of LAST RESORT!

- Special Clothing
- Eye Protection
- Hearing Protection
- Respiratory Protection…

CONTROL IS AT THE WORKER!

CONTROLS: Personal Protective Equipment - PPE

Controlling hazards such as dust, noise and fumes

PERSONAL PROTECTIVE EQUIPMENT - PPE

PERSONAL PROTECTIVE EQUIPMENT - PPE

It refers to any device, tool or material designed to be worn, worn or carried by persons to protect against one or more health and safety hazards.

THE REQUIREMENT FOR PPE

To ensure the greatest possible protection for employees in the workplace, the cooperative efforts of both employers and employees will help in establishing and maintaining a safe and healthful work environment.

In general, employers are responsible for:

- Performing a "hazard assessment" of the workplace to identify and control physical and health hazards.
- Identifying and providing appropriate PPE for employees.
- Training employees in the use and care of the PPE.
- Maintaining PPE, including replacing worn or damaged PPE.
- Periodically reviewing, updating and evaluating the effectiveness of the PPE program.

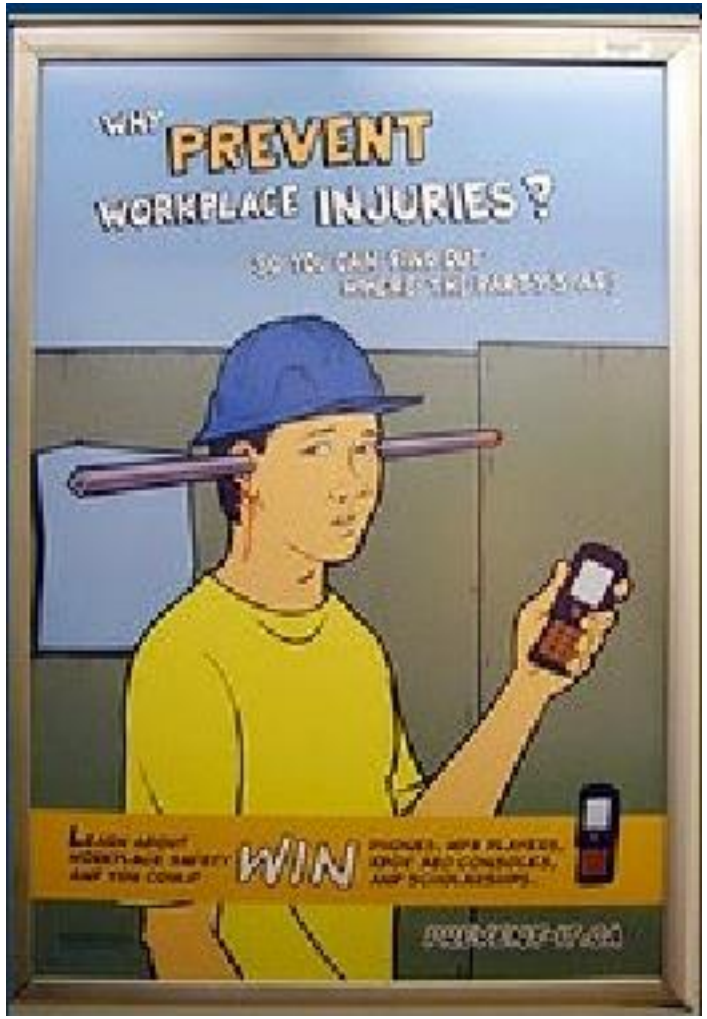
The Requirement For PPE

In general, employees should:

- Properly wear PPE,
- Attend training sessions on PPE,
- Care for, clean and maintain PPE, and
- Inform a supervisor of the need to repair or replace PPE.

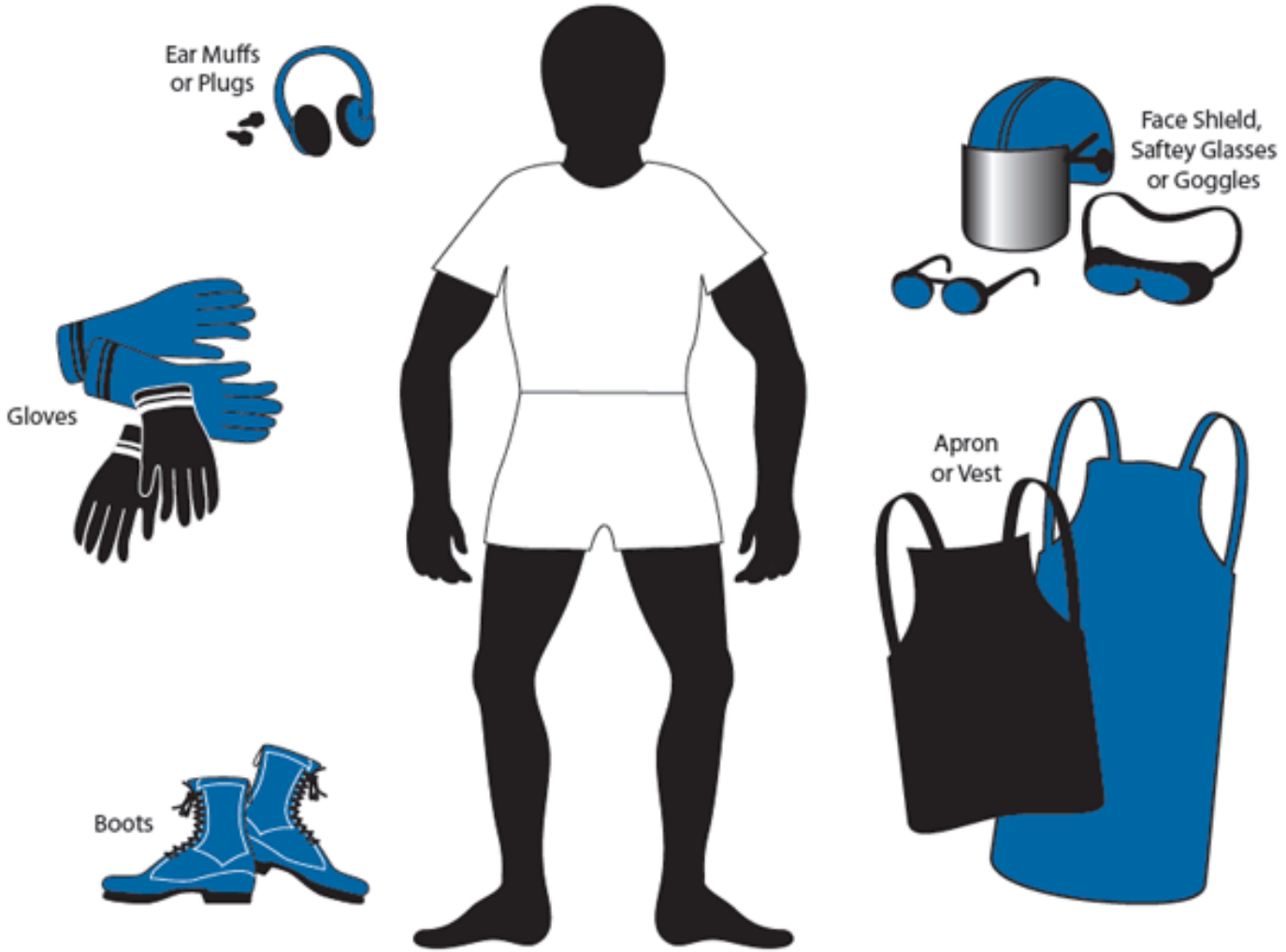
WHY IS PPE IMPORTANT?

PPE is designed to protect the worker's body form hazards and injuries such as blunt impacts, electrical hazards , heat, chemicals, and infection etc.



TYPES OF PPE

- Hearing Protection
- Eye & Face Protection
- Head Protection
- Hand Protection
- Foot Protection
- Body Protection



TYPES OF PPE

Note: Gloves and boots are tucked into coveralls

TYPES OF HEARING PROTECTORS

Types of ear protectors:

Ear plugs: are inserted to block the ear canal. They may be premolded (preformed) or moldable (foam ear plugs). Ear plugs are sold as disposable products or reusable plugs. Custom molded ear plugs are also available.

Semi-insert ear plugs: which consist of two ear plugs held over the ends of the ear canal by a rigid headband.

Ear muffs: consist of sound-attenuating material and soft ear cushions that fit around the ear and hard outer cups. They are held together by a head band.

Types of Hearing Protectors

Earmuffs

Earplugs

When should be used ear protection

Habitual exposure to noise above **85 dB** will cause a gradual hearing loss in a significant number of individuals, and louder noises will accelerate this damage.

EYE AND FACE PROTECTION

OSHA requires employers to ensure the safety of all employees in the work environment. Eye and face protection must be provided whenever necessary to protect against chemical, environmental, radiological or mechanical irritants and hazards.

Eye and face protection is addressed in specific standards for the general industry, shipyard employment, long shoring, and the construction industry.

Ordinary glasses do not protect us from work accidents

Eye and Face Protectors

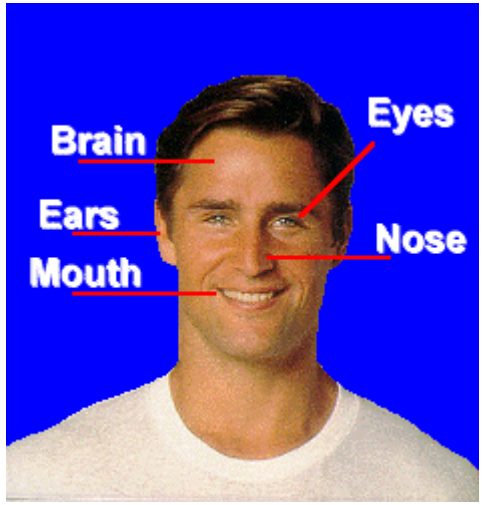
- Glasses,
- Closed goggles (diving goggles),
- X-ray glasses, laser beam glasses, ultra-violet, infrared, visible radiation glasses,

HEAD PROTECTION

Why is Head Protection Important?

In and around your head are:

- ✓ Your eyes, with which you see
- ✓ Your ears, with which you hear
- ✓ Your nose, with which you smell
- ✓ Your mouth, with which you eat and speak
- ✓ Your brain, with which you think



Injuries to the head are very serious. For this reason, head protection and safety are very important .

Head Protection

Types of Head PPE

- **Class A Hard Hats**
  - ✓ Protect you from falling objects
  - ✓ Protect you from electrical shocks up to 2,200 volts
- **Class B Hard Hats**
  - ✓ Protect you from falling objects
  - ✓ Protect you from electrical shocks up to 20,000 volts

Head Protection

- **Class C Hard Hats**
  - ✓ Protect you from falling objects
- **Bump Caps**
  - ✓ Bump caps are made from lightweight plastic and are designed to protect you from bumping your head on protruding objects

Head Protection

Hard hat test performed by the Airforce

Helmets Colors

- **White:** For engineering, manegers, supervisors
- **Red:** Fire fighter
- **Yellow:** Worker
- **Blue:** Technical operators
- **Green:** Medical personnel
- **Orange:** Foreman

HAND PROTECTION

Potential Incidences of Hand Hazards

- Traumatic Injuries
  - ✓ Tools and machines with a sharp edges can cut your hands.
    - Staples, screwdrivers, nails, chisels, and stiff wire can puncture your hands.
    - Getting your hands caught in machinery can sprain, crush, or remove your hands and fingers

Type of hand protection

- **Metal mesh gloves**

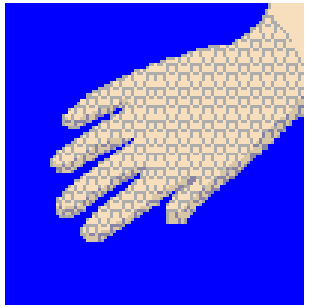
resist sharp edges and prevent cuts

- **Leather gloves**

shield your hands from rough surfaces

- **Vinyl and neoprene gloves**

protect your hands against toxic chemicals



Type of hand protection

➢**Rubber gloves**

Protect you when working around electricity

➢**Padded cloth gloves**

Protect your hands from sharp edges, slivers, dirt, and vibration

➢**Heat resistant gloves**

Protect your hands from heat and flames

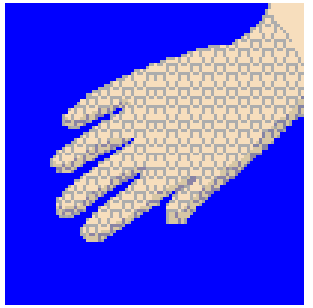
➢**Latex disposable gloves**

Used to protect your hands from germs and bacteria

Type of hand protection

- **Lead-lined gloves**

Used to protect your hands from radiation sources



- **Forearm Cuffs**

Used to protect your forearm

- **Thumb Guards and Finger Cots**

Protect only your thumb or fingers

Type of hand protection

- **Mittens**

Protect your hands while working around very cold or hot materials

- **Hand Pads**

Hand pads protect your hands while working around very hot materials

Type of foot protection

➢ **PVC footwear**

Protects your feet against moisture and improves traction

➢ **Butyl footwear**

Protects against most ketones, aldehydes, alcohols, acids, salts, and alkalies

➢ **Vinyl footwear**

Resists solvents, acids, alkalies, salts, water, grease, and blood

Type of foot protection

➢**Nitrile footwear**

Resists animal fats, oils, and chemicals

➢**Electrostatic dissipating footwear**

Conducts static electricity to floors that are grounded

➢**Electrical hazard footwear**

Insulated with tough rubber to prevent shocks and burns from electricity

➢**Disposable footwear**

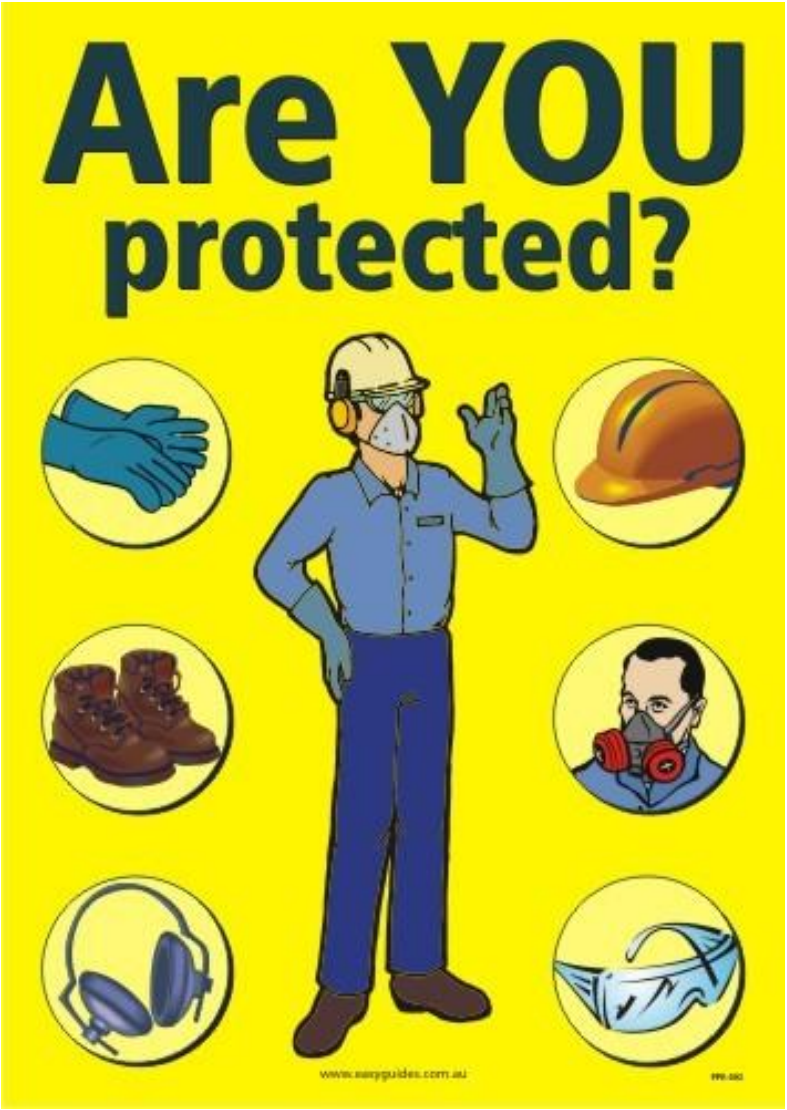
Includes shower slippers, clear polyethylene and non-woven booties used in dust free work areas

BODY PROTECTION

- The skin acts as a natural barrier to the elements
- Chemicals can break down the skin barrier and allow secondary infections to manifest

Types of Body Hazards

- Temperature stress
- Chemical Contact
- Radiation…



Types of Body PPE

- **Insulated Coats and Pants**
  - ✓ Fire resistant
  - ✓ Heat resistant
  - ✓ Cold resistant

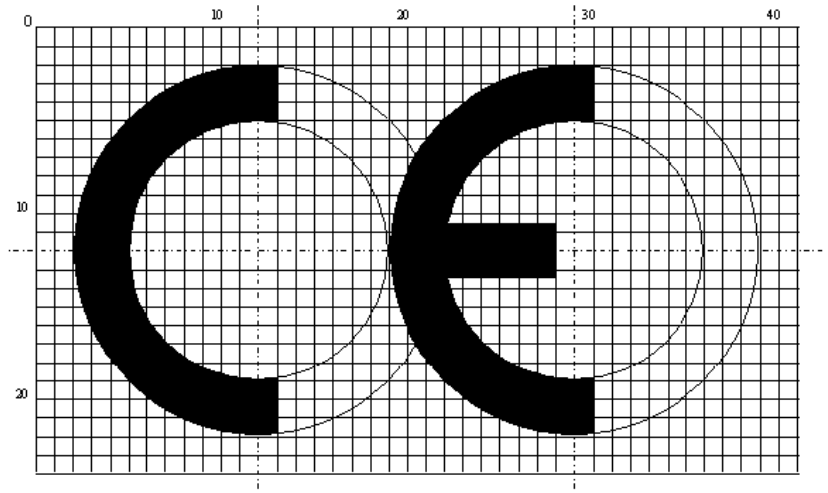
- **Sleeves and Aprons**
  - ✓ Work well when pouring or manipulating chemical to reduce splash
  - ✓ Make sure the sleeves and aprons are appropriate for the chemical

Types of Body Protection

- **Coveralls**
  - ✓Tyvek use for particulate filtering such as asbestos
  - ✓Chemical rated
- **Full body suit**
  - ✓Hazardous materials handling
  - ✓Carbon filtering for emergency response

TO SELECTING APPROPRIATE PPE

Choose good quality products which are **CE** marked in accordance with the Personal Protective Equipment suppliers can advise a safety professional.



Body Protection

Is This An Appropriate Hard Hat?

Is This an Appropriate Scaffolding?

VİDEO-2

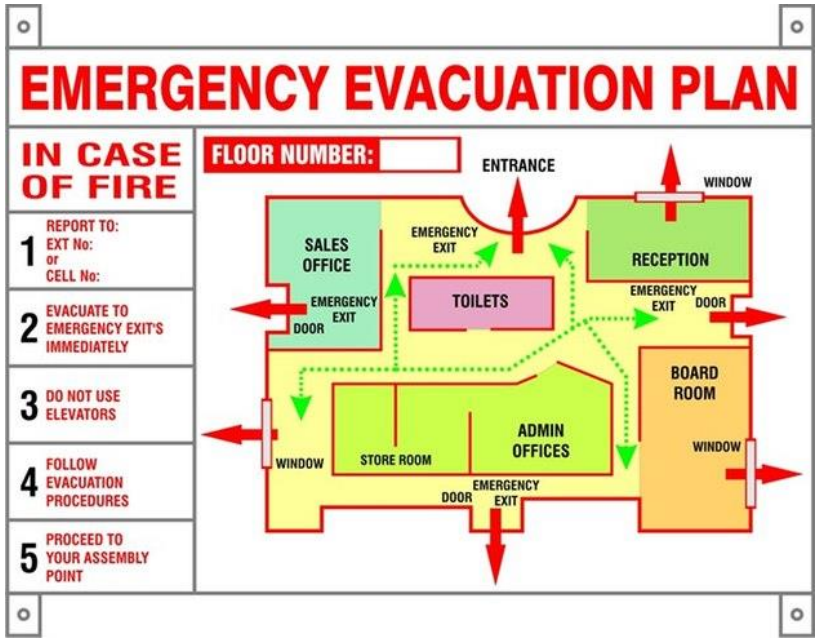
SAFETY SIGNS AND EMERGENCY PLAN

SAFETY SIGNS – COLOUR AND SYMBOL CODE

SIGN	COLOURS	MEANING
	Red Circle and Bar Black Symbol	**DO NOT**
	Blue Background White Symbol	**MUST DO**
	Red Circle Black Symbol	**RESTRICTION**
	Yellow Triangle Black Symbol	**WARNING** (hazard)
	Red Oval on Black Rectangle Black Text	**DANGER** (life threatening hazard)
	Green Background White Symbol	**EMERGENCY INFORMATION**
	Red Background White Symbol	**FIRE**

EMERGENCIES

In the case of an accident or emergency, it is important to know where the emergency equipment is and what to do.



WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM - WHMIS

WHMIS stands for the **Workplace Hazardous Materials Information System**. It is a comprehensive system for providing health and safety information on the safe use of hazardous products used in Canadian workplaces.

The main components of WHMIS are hazard identification and product classification, labelling, safety data sheets, and worker education and training.

WHMIS

W → **Workplace**

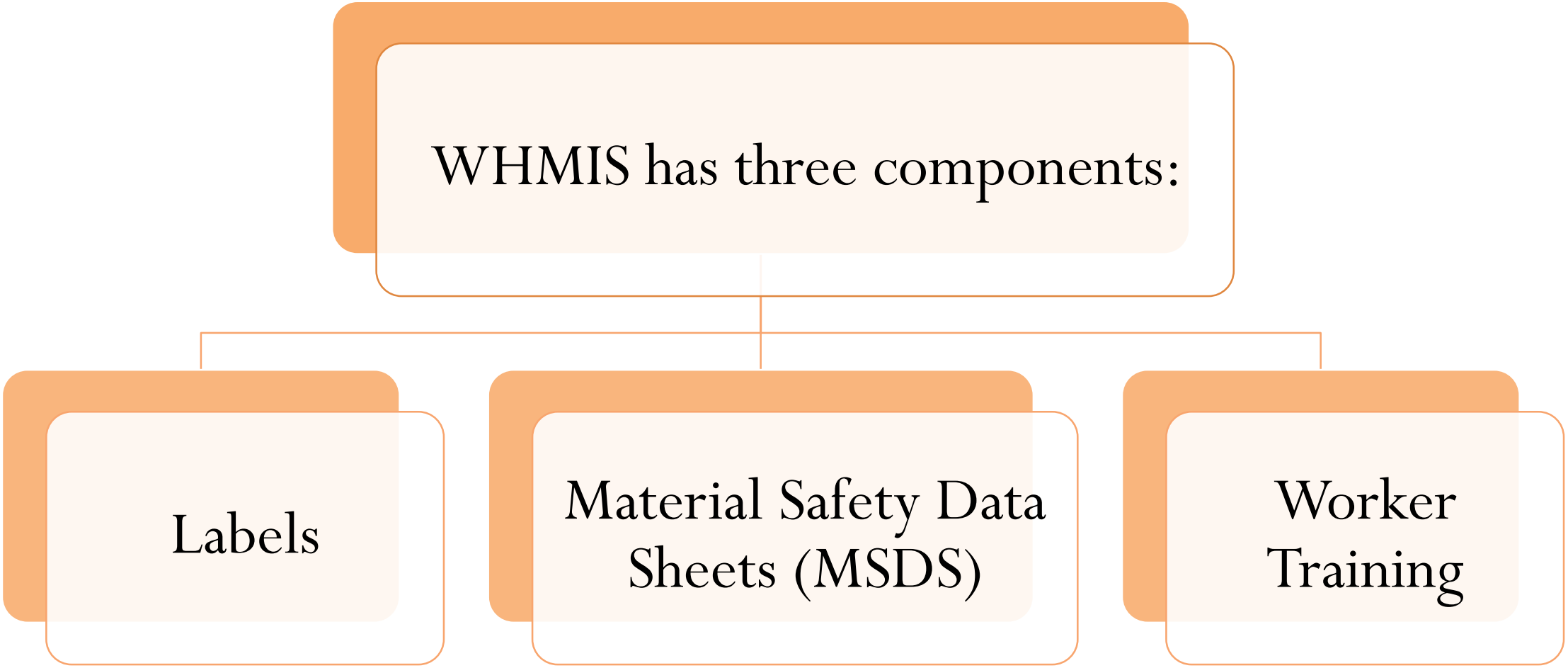
H → **Hazardous**

M → **Materials**

I → **Information**

S → **System**

WHMIS


WHMIS has three components:
Labels
Material Safety Data Sheets (MSDS)
Worker Training

WORKPLACE EMERGENCIES

An emergency is an actual or imminent occurrence such as an accident, earthquake, explosion, fire, flood or storm which:

- Endangers or threatens to endanger the health and safety of persons

or

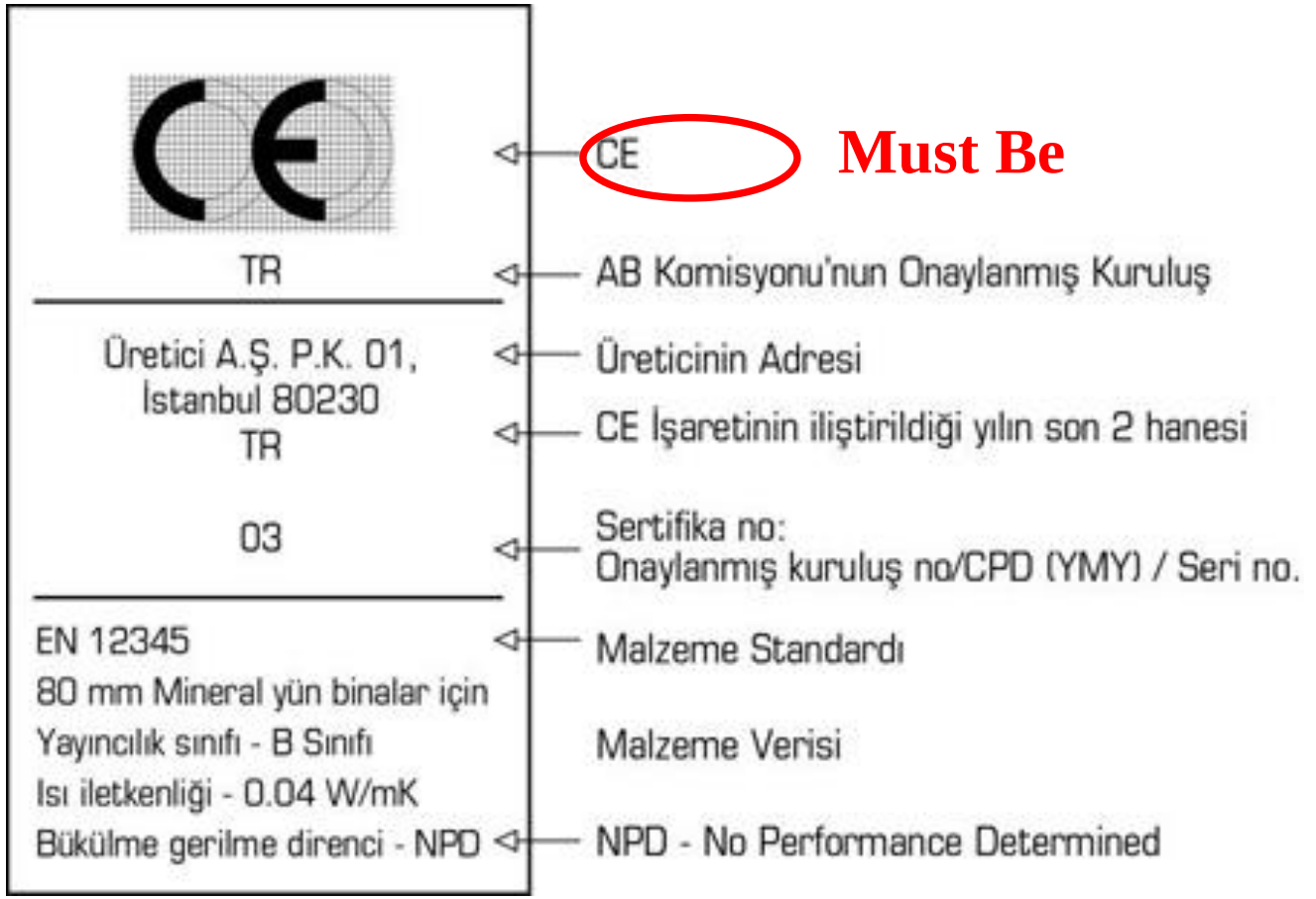
- Destroys or damages, or threatens to destroy or damage property

CHEMICAL / BIOLOGICAL - WHMIS

- WHMIS is a system designed to give employers and workers information about hazardous materials in the workplace.
- It is done by identifying and classifying the hazards in the workplace and ensuring consistency of information about hazardous materials.
- This information is given through the use of labels, Material Safety Data Sheets (MSDS) and worker training.

SUPPLIER LABEL

SUPPLIER LABEL



WHMIS Hazard Classes

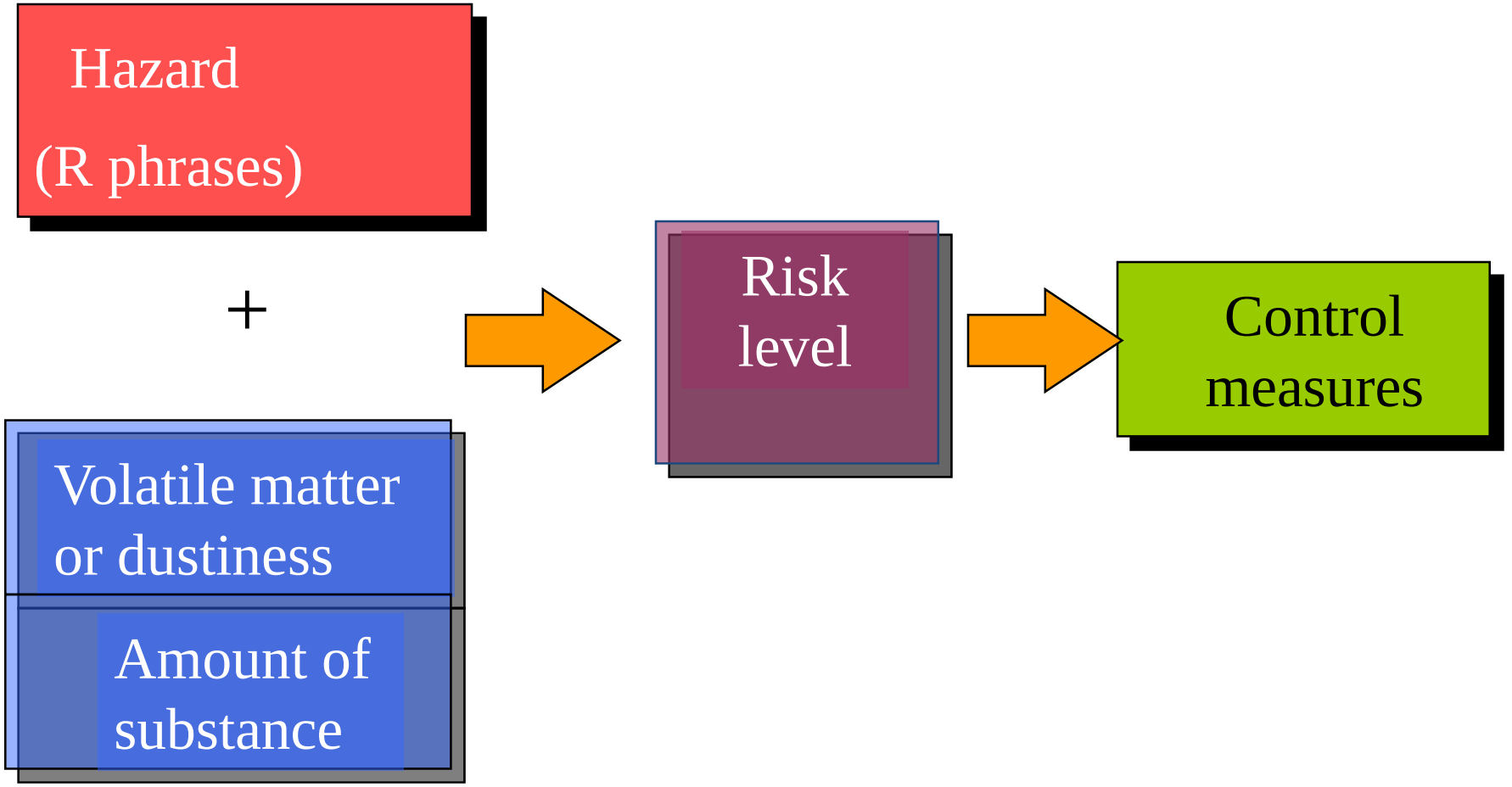
Category/ Category					
Flammable	x	X	X	x	x
Oxidizing	X	x	x	x	x
Toxic	X	x	x	x	x
Corrosive	x	x	x	x	x
Dangerous for the environment	x	x	x	x	x

X Very dangerous combination, never store together

X Dangerous combination, avoid storing together

x Only store together if compounds do not react with each other

Control of Substances Hazardous to Health Essentials



EMERGENCY PLAN

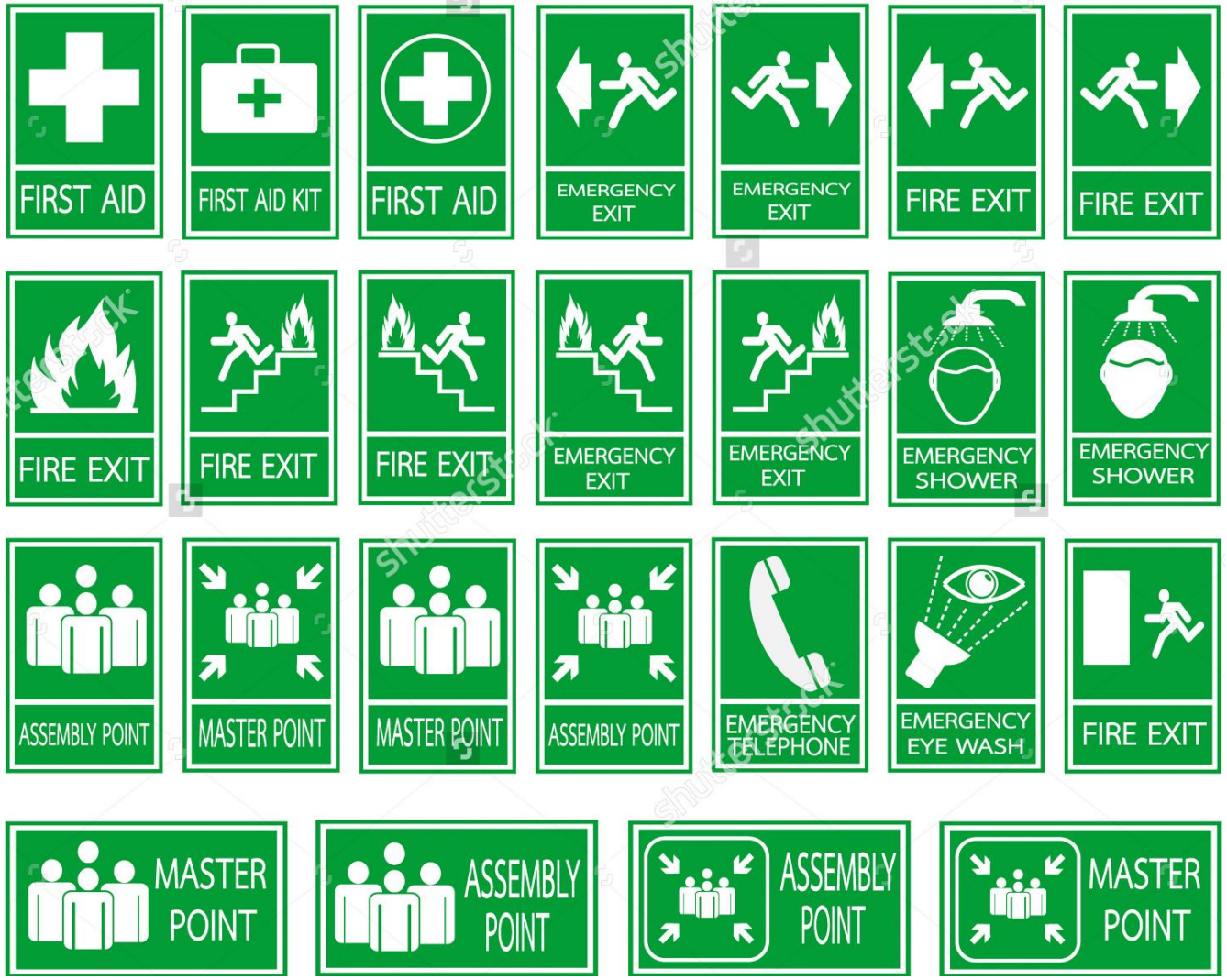
A definite plan to deal with major emergencies is an important element of OH&S programs.

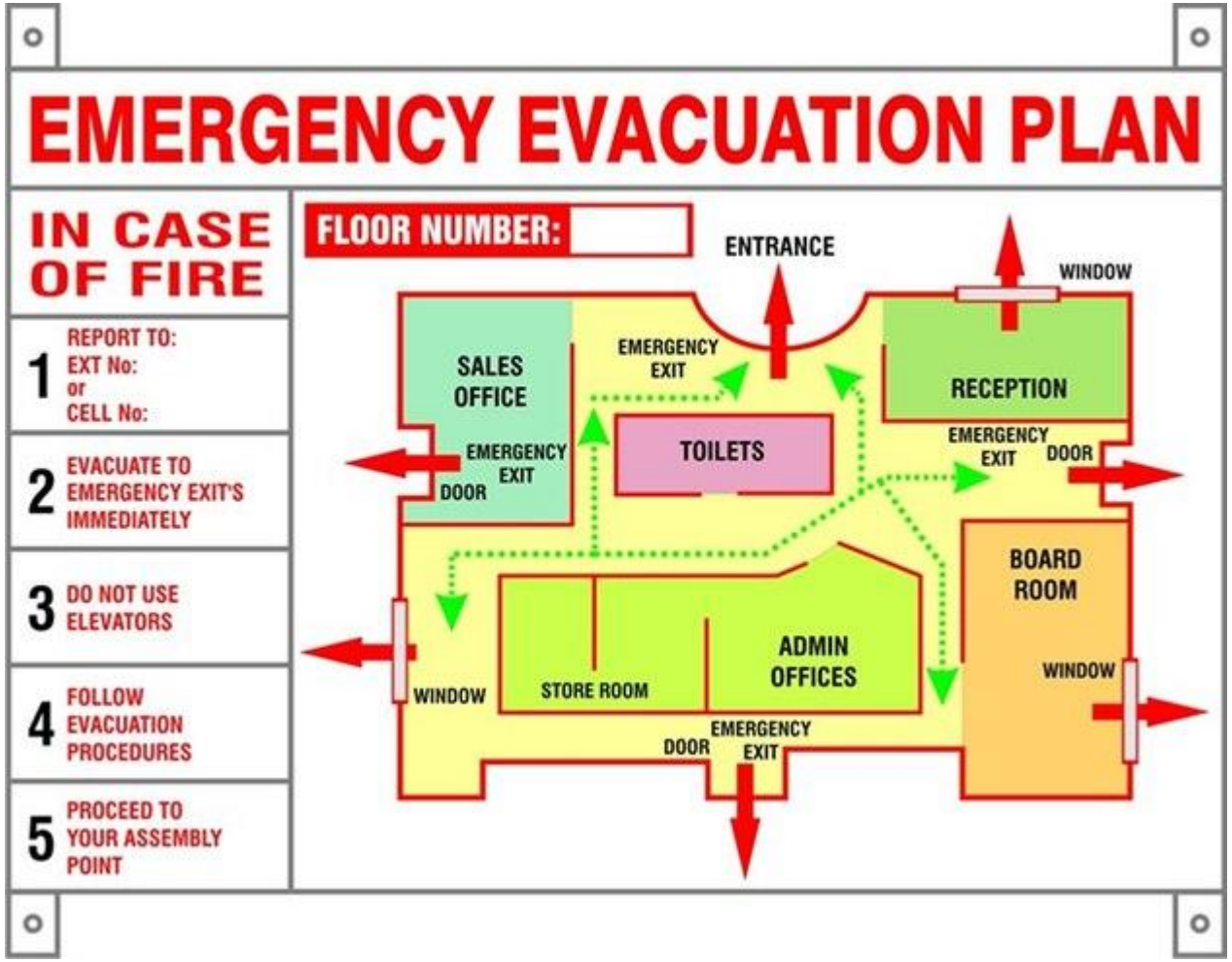
The emergency plan includes:

- All possible emergencies, consequences, required actions, written procedures, and the resources available.
- Detailed lists of personnel including their home telephone numbers, their duties and responsibilities.
- Floor plans.
- Large scale maps showing evacuation routes and service conduits (such as gas and water lines).

FIRST AID AND EMERGENCY EXIT SIGNS

	FIRST AID KIT FIRST AID ROOM
	EMERGENCY SHOWER
	EMERGENCY EYEWASH




EMERGENCY EVACUATION PLAN
IN CASE OF FIRE
1 REPORT TO: EXT No: or CELL No:
2 EVACUATE TO EMERGENCY EXIT'S IMMEDIATELY
3 DO NOT USE ELEVATORS
4 FOLLOW EVACUATION PROCEDURES
5 PROCEED TO YOUR ASSEMBLY POINT
FLOOR NUMBER:
ENTRANCE
WINDOW
SALES OFFICE
EMERGENCY EXIT
RECEPTION
TOILETS
EMERGENCY EXIT DOOR
EMERGENCY EXIT DOOR
BOARD ROOM
WINDOW
STORE ROOM
ADMIN OFFICES
WINDOW
EMERGENCY EXIT DOOR

WORKPLACE EMERGENCY RESPONSE TEAMS

Emergency response team members should be thoroughly trained for potential crises and physically capable of carrying out their duties. Team members need to know about toxic hazards in the workplace and be able to judge when to evacuate personnel or when to rely on outside help.

WORKPLACE EMERGENCY RESPONSE TEAMS

One or more teams must be trained in:

- Use of various types of fire extinguishers,
- First aid, including cardiopulmonary resuscitation and self-contained breathing apparatus,
- Requirements of the OSHA blood borne pathogens standard,
- Shutdown procedures,
- Chemical spill control procedures,
- Search and emergency rescue procedures,
- Hazardous materials emergency response,

REPORTING ACCIDENTS AND EMERGENCIES

Are you aware of the workplace emergency and accident procedures?

What are your responsibilities?

- Discuss notification of near misses, minor injuries, damage to property but not people and potential behavioural changes such as medication changes that may mean a supported employee will be drowsy.
- Details of where information is kept, and who controls it should be highlighted.

EXAMPLES OF WORKPLACES DANGER

PHYSICAL

NOISE

- ✓ The noise in mechanical rooms or around equipment can exceed the Provincial guidelines. The sound levels are measured and signs are posted as required.

Physical

DUSTINESS

Low: Pellets and similar. Little dust is seen during use

Medium: crystalline, granular solids. When used, dust is seen but settles out quickly

High: Fine, light powders. There are dust clouds that can remain for minutes

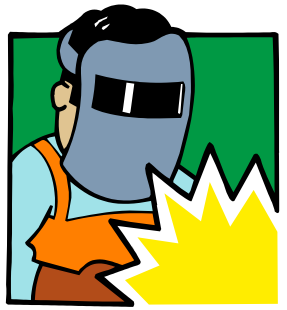
VOLATILE MATTER:

TANE BÜYÜKLÜĞÜ	ÖZELLİKLERİ
300 - 100 micron	It cannot stay suspended in the air for long periods of time. They cannot penetrate the body.
100 - 50 micron	It is retained in the upper respiratory tract and visible to the eye.
50 - 5 micron	It reaches the lungs and accumulates in the alveoli.
< 0.5 micron	It is harmless to the body goes in and out of the lungs.

Physical

ULTRAVIOLET LIGHT

- ✓ UV light is produced during the welding process. Care must be taken to wear the proper eye and face protection while welding.



HEIGHTS

- ✓ Working at heights above 3 meters requires you to be tied off.

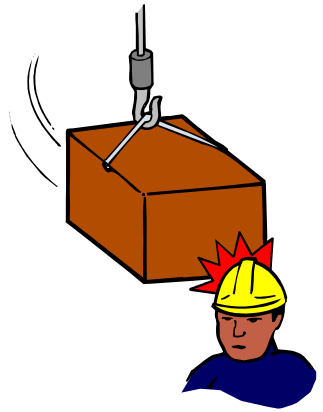
Physical

FORKLIFT

The forklift traveling through the facility can be hazardous for anyone walking, the load being carried could restrict the vision of the operator. Operators must be certified to operate the forklift.

CRANE

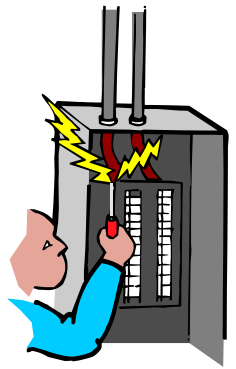
The crane moving back and forth could be carrying loads and creating a hazard overhead. Operators must be certified to operate the Crane.



Electrical / Magnetic

ELECTRICAL FIELDS

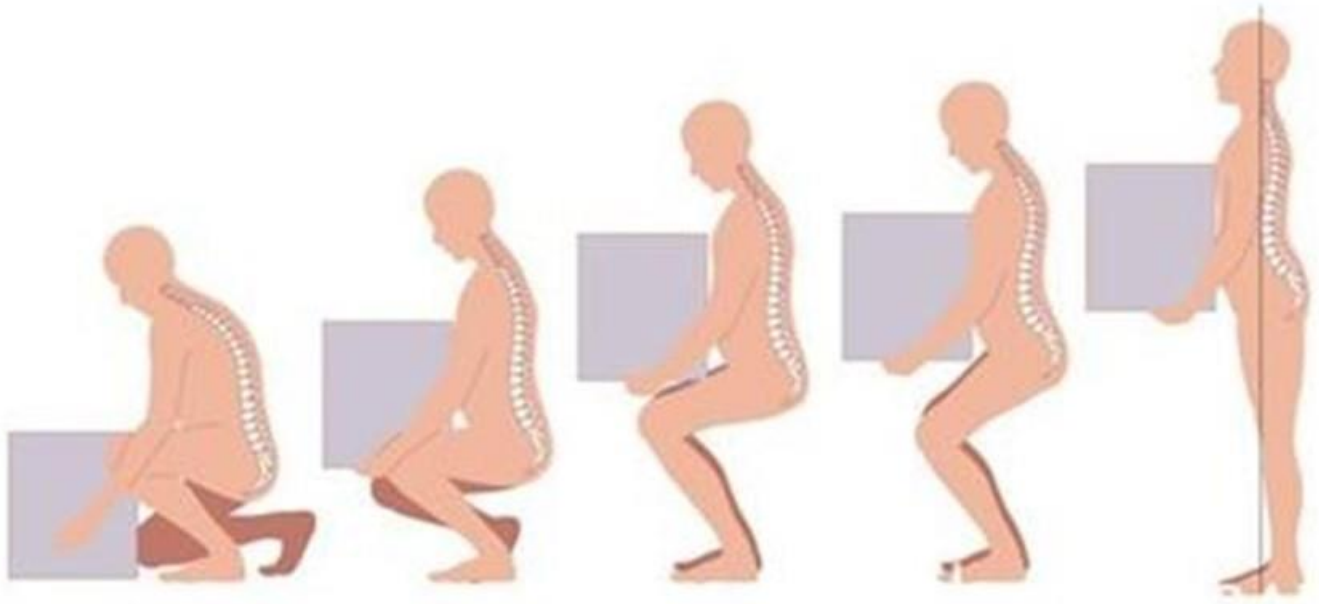
- ✓ The CLS uses high voltage and current to operate various power supplies.
- ✓ There are 4 main types of injuries
  - Direct contact with electrical energy
  - Electrical arcs
  - Thermal burns
  - Muscle contractions causing a worker to fall



MAGNETIC FIELDS

- ✓ Exposure to magnetic fields of extremely low frequency may present a health risk.

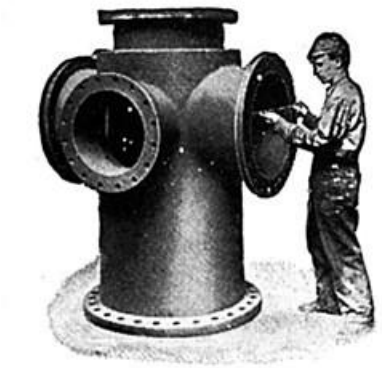
ERGONOMICS



ERGONOMICS

Ergonomics is the science of matching the job to the worker and the product to the user covering the situations such as lifting, lighting, office/desk set up, etc. that may contribute to injury.

Ergonomics is the study of the interaction between the worker and the workstation.



What is Ergonomics?

- The applied science and art that seeks to fit the job to the worker through the evaluation and design of work environment in relation to human characteristics and interactions in the workplace.

- **“ Adjusting the workspace to best fit the employee”**

Ergonomics Applies to…

- **Workstation Design** (desks, chairs, space, layout)
- **Work Postures** (sitting, standing, reaching, lifting)
- **Work Organization** (Pace, Breaks, Variety)
- **Tools, Equipment, and Furniture Design** (body size, height, gender, promoting neutral postures, reduced vibration, exposure to acceptable lighting, noise, temperature)
- **Manual Materials Handling** (lifting, lowering, pulling, pushing, carrying and holding materials)
- **Work Environment** (ventilation, noise, temperature & humidity, lighting and vision)

Ergonomics

Injuries can occur from:

- ✓ Repetitive motions
- ✓ Forceful exertions
- ✓ Vibration
- ✓ Mechanical compression
- ✓ Sustained or awkward position
- ✓ Limitations on motion or action

To prevent injuries:

- ✓ Adjust your workstation to fit you
- ✓ Take needed breaks to allow for the movement of your joints
- ✓ Use equipment that is designed to reduce harmful effects of the activity

ERGONOMIC: Standing Work

Associated Risk Factors:

- Static Postures
- Erroneous Postures – neck, head and arms

Associated Health Concerns:

- Sore feet
- Swelling of the legs
- Fatigue
- Low back pain
- Neck pain

Standing Work…

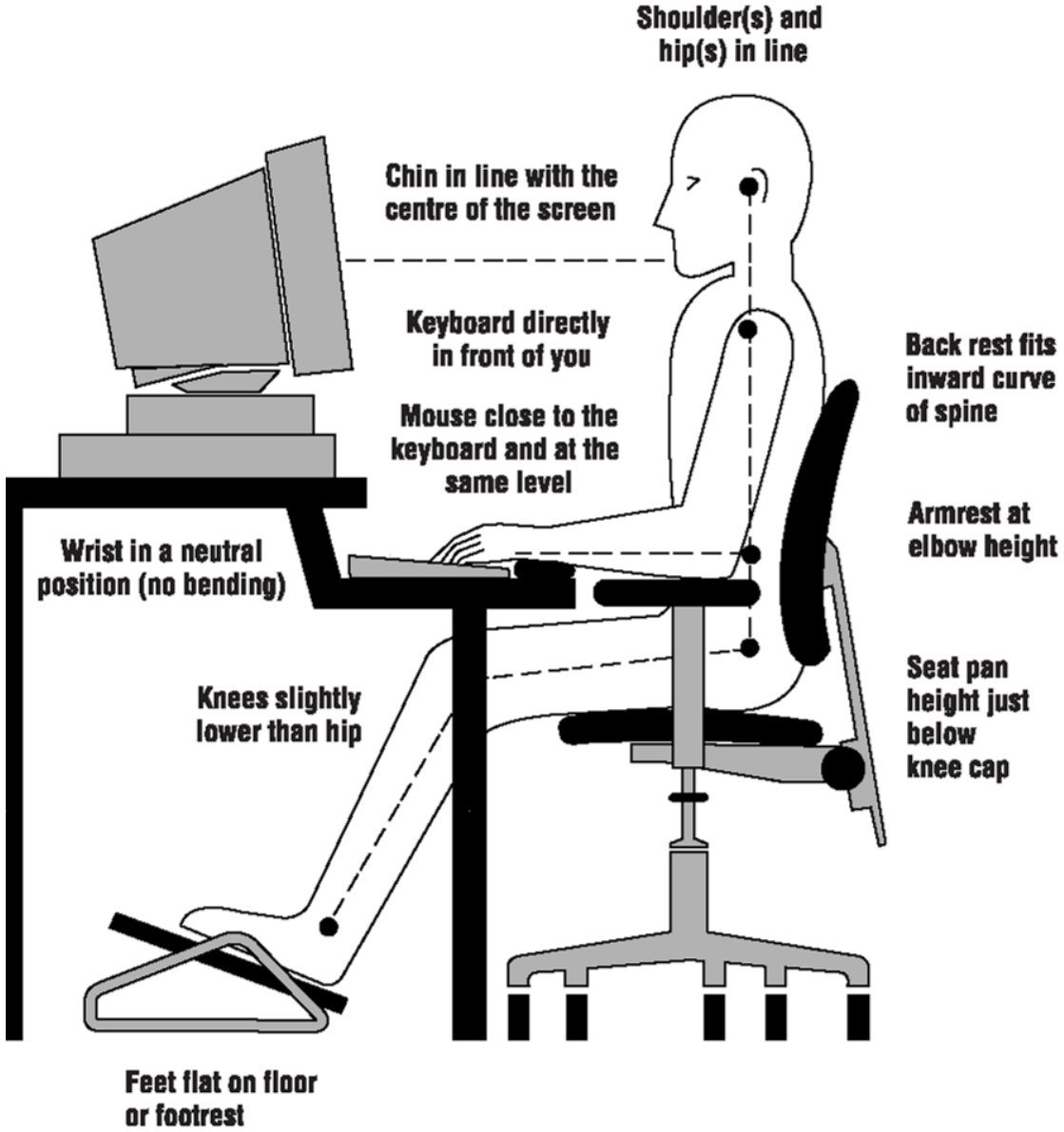
Preventative Measures:

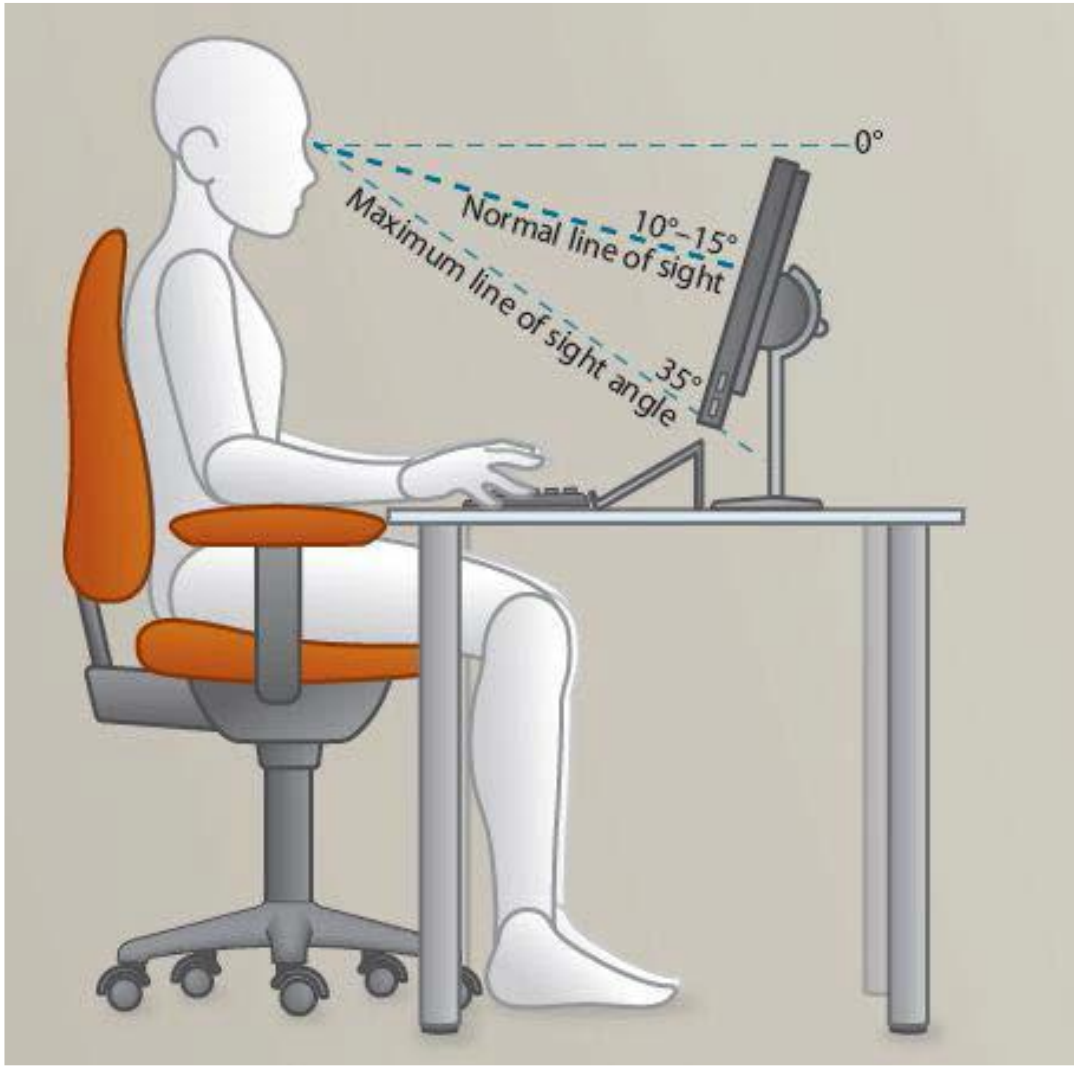
- Proper shoes
- Change in posture
- Walking
- Footrests
- Sit-stand stools
- Anti-fatigue mats

ERGONOMIC: Computer Workstation Ergonomics

Computer workstation ergonomic considerations:

- User
- Workstation configuration
  - ✓ Chair
  - ✓ Desk & Keyboard/Mouse Tray
  - ✓ Input Devices
  - ✓ Monitor – CRT vs. LCD
- Tasks
- Office lighting





CCOHS Office Ergonomics Safety Guide 2002

ERGONOMIC: Lifting

Risk Factors:

- Health & injury history
- Lifting, carrying, pulling & pushing
- Awkward & static postures
- Object weight

Preventative Measures:

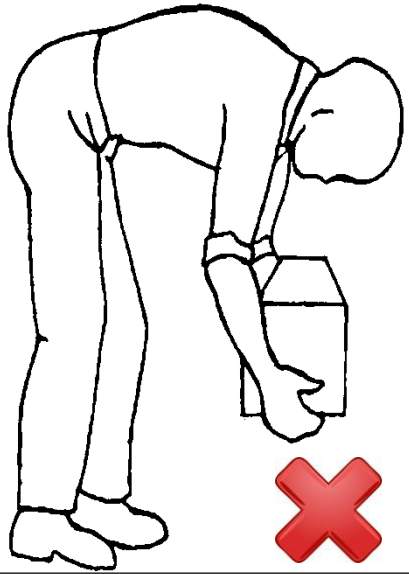
- Neutral postures
- Fitness
- Shorten lever arms
- Minimize weight
- Proper lifting technique

Safe Lifting

- The center of gravity of the load should be planned close to the worker.
- The storage area should be at or above waist level to prevent body tilting.
- The load must be carried by mechanical lifts up to waist height.
- More than one person may be required to carry the load.

THEN

WHICH ONE IS CORRECT?



Safe Lifting

TRUE

FALSE

TRUE

FALSE

TRUE

FALSE

TRUE

FALSE

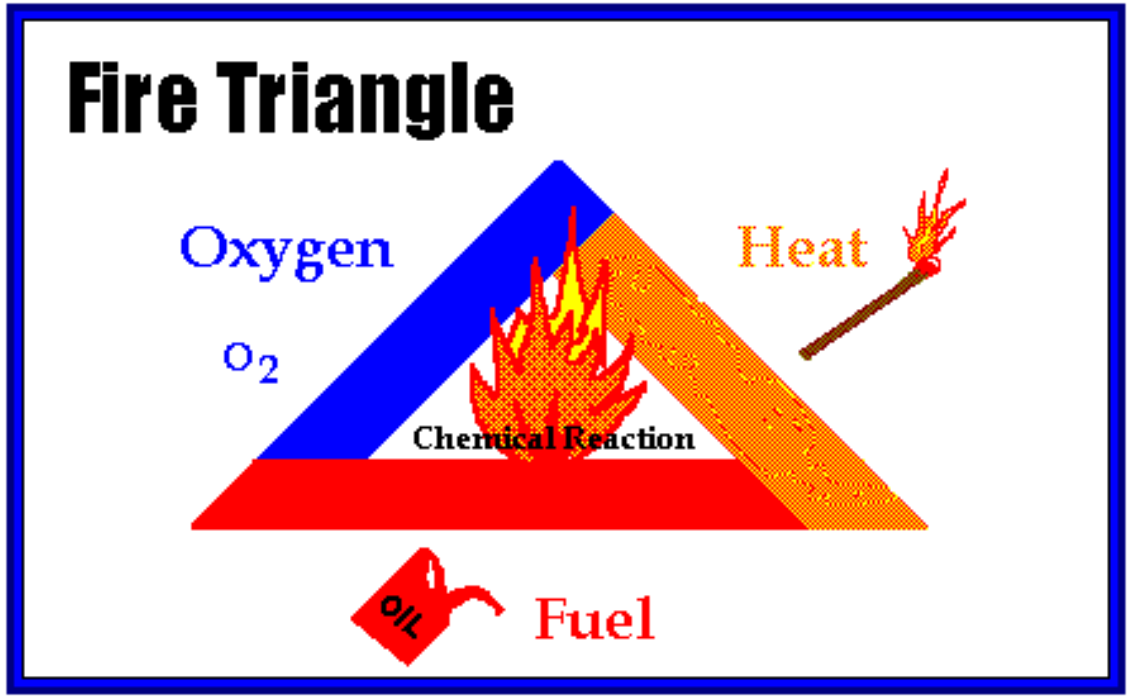
Ergonomic: Chairs

- Chairs are one of the most important pieces of office equipment. To be effective, the chair needs to be adjusted to suit the user.
- Features of a well-designed chair that can be adjusted to suit a range of people include:
- Back rest easily adjustable in height and angle
- Back rest provides lumbar support
- Height of chair is adjustable
- Seat (pan) width is appropriate for the individual user
- Seat (pan) depth is appropriate or adjustable
- Adjustable or removable armrests
- Five star castor base for stability, and
- “Breathable” fabric.

FIRE TRAINING

FIRE

- **Basic components of a fire are:**
  - ✓ Fuel
  - ✓ Source of ignition
  - ✓ Oxygen
  - ✓ Process of combustion
- **Commonly referred to as the "fire triangle"**



Workplace:

FIRE PREVENTION

FLAMMABLES

1) Use approved containers that are designed to prevent sparking activity.
2) Keep area free of drips and spills.
3) Follow rules for disposing of containers and items containing flammable wastes.

CHECK EQUIPMENT

1) Check and maintain machinery at regular intervals.
2) Check that fire fighting equipment and extinguishers are recharged and in operational condition.

WORK SAFELY

1) Keep work area clean and tidy.
2) Show care in handling combustible materials.
3) Use safety cans for oily or flammable rags.
4) Smoke only in designated areas.

FIRE TYPE

Class A fire: Means a fire involving ordinary combustible materials such as paper, wood, cloth, and some rubber and plastic materials. **Ordinary combustibles**

Class B fire: Means a fire involving flammable or combustible liquids, flammable gases, greases and similar materials, and some rubber and plastic materials. **Flammable liquid and gas**

Class C fire Means a fire involving energized electrical equipment where safety to the employee requires the use of electrically nonconductive extinguishing media. **Electrical**

Class D fire Means a fire involving combustible metals such as magnesium, titanium, zirconium, sodium, lithium and potassium. **Metal**

Fire Extinguishers

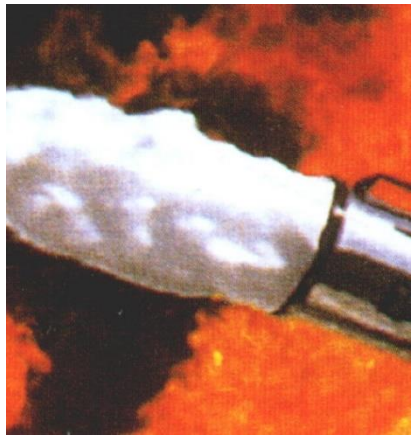
EXTINGUISHER		TYPE OF FIRE				
Colour	Type	Solids (wood, paper, cloth etc)	Flammable Liquids	Flammable Gasses	Electrical Equipment	Cooking Oils & Fats
	Water	✓ Yes	✗ No	✗ No	✗ No	✗ No
	Foam	✓ Yes	✓ Yes	✗ No	✗ No	✓ Yes
	Dry Powder	✓ Yes	✓ Yes	✓ Yes	✓ Yes	✗ No
	Carbon Dioxide (CO_2)	✗ No	✓ Yes	✗ No	✓ Yes	✓ Yes

Extinguisher Classification

Water

Carbone dioxide

Dry chemical powder

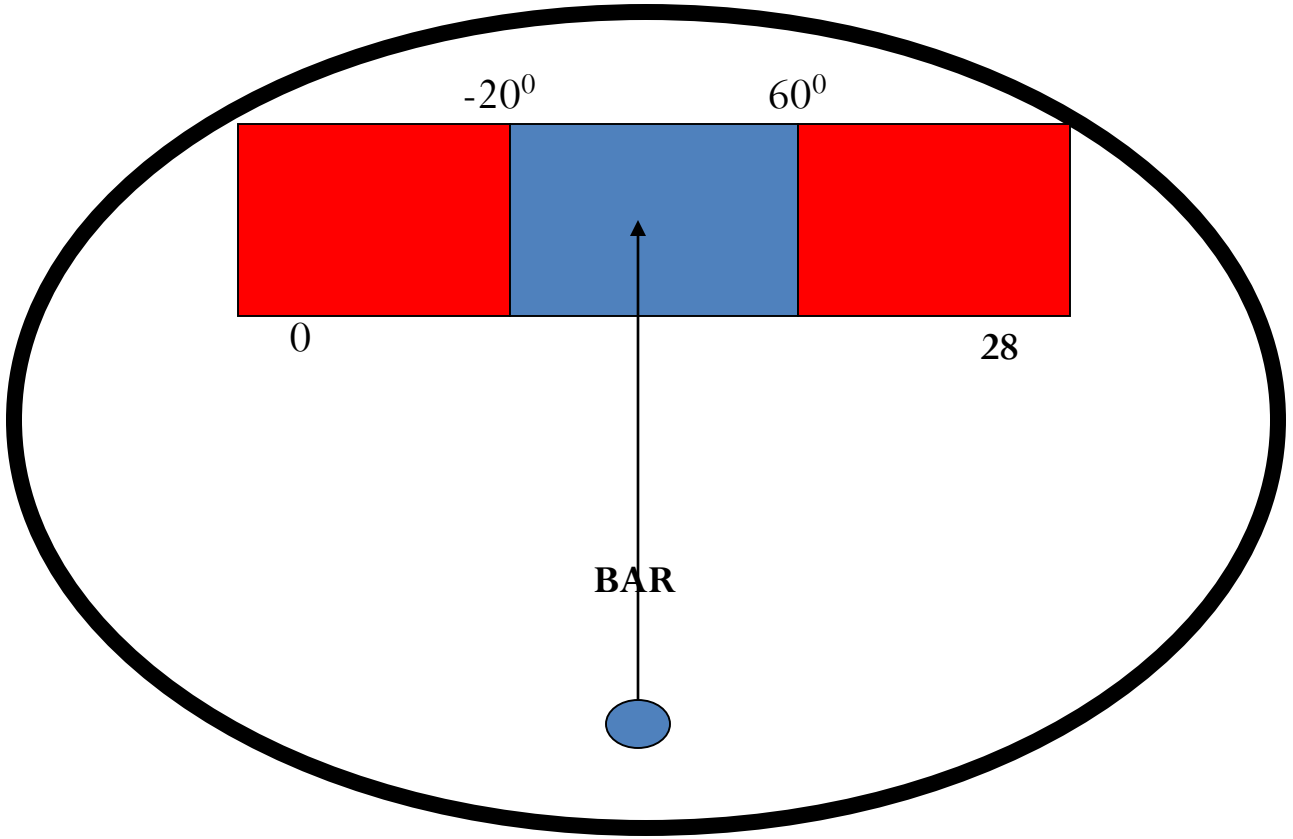


Foam

Maintaining Portable Fire Extinguishers

- Must maintain in a fully charged and operable condition
- Must keep in their designated places at all times except during use
- Must conduct an annual maintenance check
- Must record the annual maintenance date and retain this record for one year after the last entry or the life of the shell, whichever is less

Maintaining Portable Fire Extinguishers



BAROMETRE

Remember the PASS word

Pull

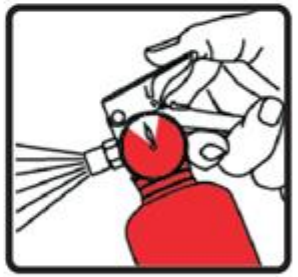
Pull the pin (or other motion) to unlock the extinguisher.

Aim

Aim at the base (bottom) of the fire and stand 6 - 10 feet away.

Squeeze

Squeeze the lever to discharge the agent.



Sweep

Sweep the spray from left to right until the flames are totally extinguished.

WAS IT AN OCCUPATINAL ACCIDENT?


Thanks For Your Participation
THINK SAFETY and BE SAFE