

# Basic Concepts of Health & Safety

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## Objectives

By the end of the course, the student will be able to:

- **Learn** the common terminologies in HSE – Hazards, Risks, Near Misses, Incidents, etc ;
- **Recognize** the fundamental principles of HSE.

# Introduction

According to the *International Labour Organization (ILO)*, nearly **3 million** people die each year due to work-related accidents and diseases. Additionally, around **374 million** non-fatal work-related injuries occur annually.

In Algeria, **42,032** workplace accidents were reported in 2021 by the Algerian National Social Insurance Fund for Salaried Workers. Most of these accidents were recorded in the building and construction field, followed by the exploration and drilling of the oil and gas company, which comes at the forefront of the Sonatrach Company.

(see Video 1. Accidents in the workplaces.[watch])

Therefore, understanding health, safety, and environment (HSE) is essential in preventing accidents and ill health, which costs businesses money, reputation, and corporate existence. HSE is required in engineering, sciences, maritime, oil and gas, IT, art and medicine, administration and management, banking, and finance.

# I Hazard and Risk

## 1. Introduction

This infographic will help you understand the difference between **hazard** and **risk**, two terms that are often incorrectly used as synonyms.

(see Video 2. Hazard vs. Risk: What's the Difference?[watch])

## 2. What is hazard?

### Az Definition

A Hazard is a situation, condition, or object that has the potential to cause harm, loss, or damage to life, health, property, or the environment.

### Note

Hazards can be categorized into different types, such as :

- Physical (e.g., earthquakes, floods),
- Chemical (e.g., toxic substances, explosives),
- Biological (e.g., pathogens, allergens),
- Ergonomic (e.g., repetitive strain, poor posture), and
- Psychosocial (e.g., stress, violence).

### Example

Oil on the floor or chemical products stored can potentially cause harm.



Image 1 - spilled oil on the floor.



Image 2 - Chemical products stored.

### 3. What is a risk?

#### Az Definition

Risk refers to the possibility of experiencing harm, loss, or adverse effects resulting from exposure to Hazards.

#### Example

Exposure of a worker to spilled oil.



Image 3. Worker walks on a spilled oil.

#### Example

The operator handles the containers, so he is exposed to hazardous chemicals. We say that the operator is exposed to hazards because there is a possibility of something bad happening.



Image 4 - An operator handles containers of hazardous chemicals.

#### Note

Note that risk is exposure to a hazard that likely causes harm.

**(Risk = Hazard + Exposure)**

#### Extra

Understanding risk involves considering several vital aspects:

1. **Probability of occurrence:** measures how likely a hazard will lead to a harmful event.
2. **Severity of impact:** assesses the potential extent of damage or harm that could result from the risk.

#### Example of probability of occurrence

#### Example

*Situation n° 01* : A laboratory analyst is measuring the pH of groundwater and handles hundreds of samples **daily**.


*Analysis of the situation n° 01* : In this case, the likelihood of a container spilling and exposing the analyst to groundwater would be **high**.

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*Situation n° 02* : An other laboratory analyst is conducting research on *electroplating* with cyanide baths and only uses the bath **monthly**.

*Analysis of the situation n° 01* : The probability of an occurrence happening would be **low**.

### Example of severity of impact

 Example

*Situation n° 03* : The severity of impact for a laboratory analyst measuring the pH of groundwater samples would likely be **No Risk** in the event of a “**failure**” that caused a laboratory analyst to be exposed to the groundwater.

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*Situation n° 04* : The severity of impact for a laboratory analyst conducting electroplating research with cyanide baths would be **High** in the event of a “**failure**” that caused an employee to be exposed to cyanide.

Conclusion

(see Hazard vs risk By eufic.pdf)



## II Incidents and their outcomes

### 1. Incident, accident, and near miss

#### Az Definition

1. **An incident** is a work related event in which a damage, injury, ill health, or fatality to (persons/property) occurred, or could have occurred.
2. **An accident** is an unexpected event that results in damage, injury, or harm to persons.
3. **A near miss** is an unintended event that may have resulted in damage, injury, or fatality to (persons/property) but was narrowly avoided.



Image 5 - Accident and near miss

(see Video 3. How to distinguish between an Incident, Accident & Near Miss.[watch])

### 2. Outcomes of incidents

#### Damage versus harm

**Damage** represents physical harm or injury to an object or property, such as a vehicle or a building, whereas **harm** refers to the negative impact or injury to an individual's physical, emotional, or mental well-being.

Accidents, natural disasters, or deliberate activities can cause both damage and harm.

Preventing and reducing damage and harm is essential for the safety and well-being of humans and their environment.



*Image 6 - car damage.*



*Image 7 - a person harmed because of a road accident.*

## **Injury and fatality**

1. **Injury** specifically refers to physical harm or damage to the body, such as cuts, or fractures.
2. **Fatality** refers to death resulting from an accident or incident.

# III Importance of Health, Safety, and Environment (HSE)

## 1. The importance of health, safety, and environmental considerations in industry

Industry involves high-risk activities, including, but not limited to, the exploration, production, and processing of highly combustible and explosive substances.

**NOW, imagine YOU were in the following event!!!**



*Image 8 - Piper Alpha disaster*

(see Video 4. The Untold Story: Piper Alpha Oil Rig Disaster Revealed[watch])

HSE fundamentals represents the foundation of **a safe and responsible work environment**.

The primary goal of HSE is to prevent accidents, injuries, and environmental harm.

Health, Safety, and Environment (HSE) is important to employees and employers. It guarantees employees' health and safety, enhancing workplace satisfaction and productivity. Conversely, employers gain from reduced operational risks, decreased insurance expenses, and improved corporate responsibility.

(see Video 5. The importance of HSE in workplace[watch])

