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DLE 2083: INTRODUCTION TO SECURITY MANAGEMENT

CHAPTER 4: HAZARDS, THREATS AND CONTRIBUTORS

Chapter 4: Learning Outcomes

- At the end of the topic, students should be able to:
  - Defines hazard in general.
  - Describe how threat differ from hazard.
  - Discuss type of hazard.
  - Describe classification of hazard.
  - Explain the category of hazard.

The Sources and Causes of Risk

1. Sources

- Hazards and threats are the sources of negative risk.
- The hazard and threat are different states of the same thing.
- For example; the hazard is the source in a harmless state (such as a river remote to you), and the threat is the source in a harmful state (such as a flood that reaches you).

The Sources and Causes of Risk…cont.

- The hazards and threats are sources of the risk in the sense that they are the actual actors or agents with the potential to harm, while the risk is the potential harm.
- Even the simplest risks are usefully analyzed back to their sources and causes.

The Sources and Causes of Risk…cont.

- For example, a river, as a hazard, is one potential source of a flood; a flood is a threat to lives and property on the flood plain.
- The risks include potential drownings and potential property damage. If we want to terminate the source of the flood, we would need to prevent the river from ever flooding.

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The Sources and Causes of Risk…cont.

2. Causes

- A cause is the reason for some change.
- The words source and cause are often conflated, but they are separate concepts.
- The source of the risk is the hazard or threat.
  - – The cause of the threat is whatever activated the hazard into the threat.

The Sources and Causes of Risk…cont.

- For example, the river is a source for a flood. The threat (flood) is activated by unusual causes (such as unusual rainfall, high tides, saturated ground, poor drainage, etc.).
- The causes of the threat are separate to the normal sources of the river (such as rainfall and springs) that do not normally cause a flood.

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Threat

- **Defining Threat**
- A threat is an actor or agent in a harmful state.
- A threat is any actor or agent whose capacity to harm you is not currently avoided, contained, inactive, or deactivat

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Activation of Hazards as Threats

- Hazard and threat are different states of the same thing. Concepts that explain a hazard's transition to threat include:

i. Activation (activity related)

ii. Coincidence

iii. Enablement

iv. And release from containment

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HAZARD

What is hazard?

- A hazard is any agent that can cause harm or damage to humans, property, and the environment.

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Hazard

- **Defining Hazard**
- A hazard is a potential, dormant, absent, or contained threat.
- Hazard and threat are different states of the same thing.
  - – The hazard is in a harmless state, the threat in a harmful state.
- The hazard would do no harm unless it were to change into a threat.

Hazard

- For example, a river is a hazard as long as it does not threaten us but the river becomes a threat to us when:
  - it floods our property
  - we fall into it, or
  - we drop property into it
- As long as we or our property are not in the water, the river remains a hazard to us and not a threat.
- Hazards become threats when we are coincident with, enable, or activate the harmful state.

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Hazard vs. Risk

- The terms "hazard" and "risk" are often used interchangeably.
- However, in terms of risk assessment, these are two very distinct terms.
- A hazard is any agent that can cause harm or damage to humans, property, or the environment.
- Risk is defined as the probability that exposure to a hazard will lead to a negative consequence, or more simply, a hazard poses no risk if there is no exposure to that hazard.

Hazard: Sources & Causes of Risk

- Basically, a hazard can cause harm or adverse effects to individuals (e.g. health effects), or to organizations (e.g. property or information losses).

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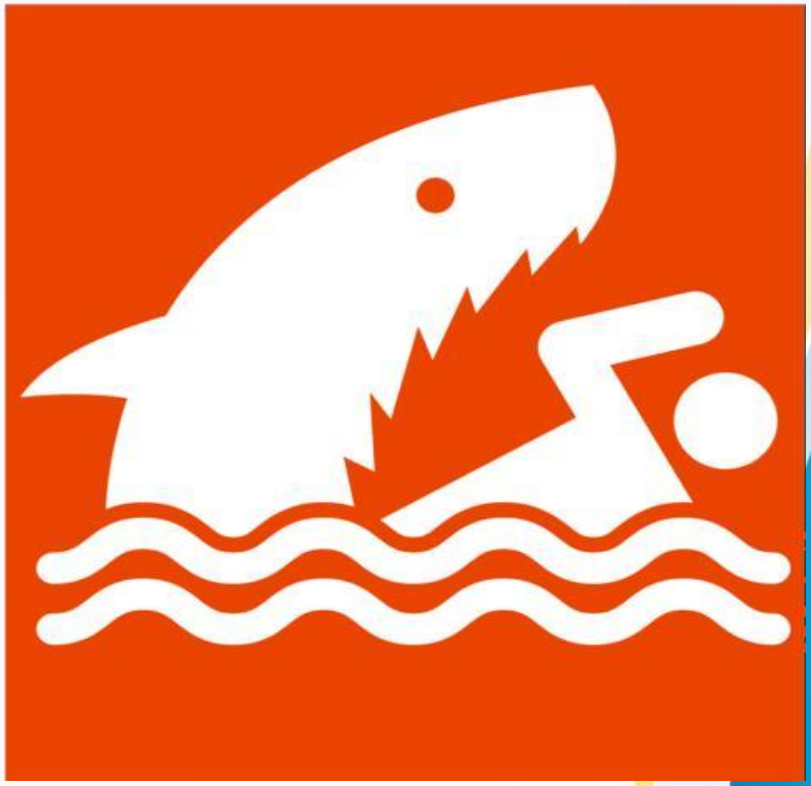
HAZARD vs RISK

A HAZARD is something that has the potential to harm you

RISK is the likelihood of a hazard causing harm



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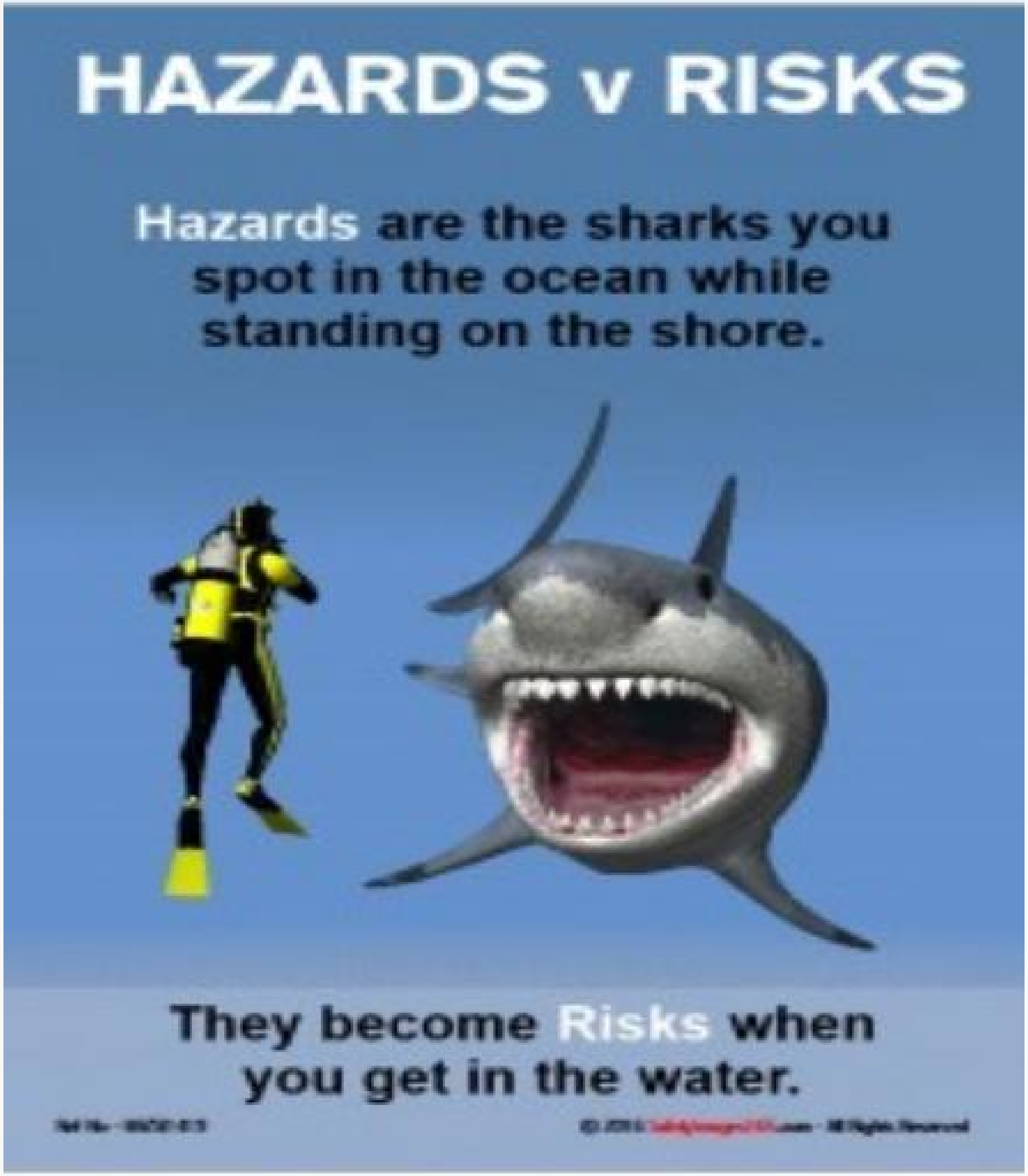

Classification of Hazard

- Hazards can be classified as different types in several ways.
- Hazards may also be classified as natural, anthropogenic, or technological.
- Hazards also may be classified as health or safety hazards and by the populations that may be affected.

Classification of Hazard

1. Biological hazard

- Biological hazards, also known as biohazards, originate in biological processes of living organisms, and refer to agents that pose a threat to the health of living organisms, the security of property, or the health of the environment.

Examples of Biological hazard

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Classification of Hazard

2. Chemical hazard

- A chemical can be considered a hazard if by virtue of its intrinsic properties it can cause harm or danger to humans, property, or the environment.

Classification of Hazard

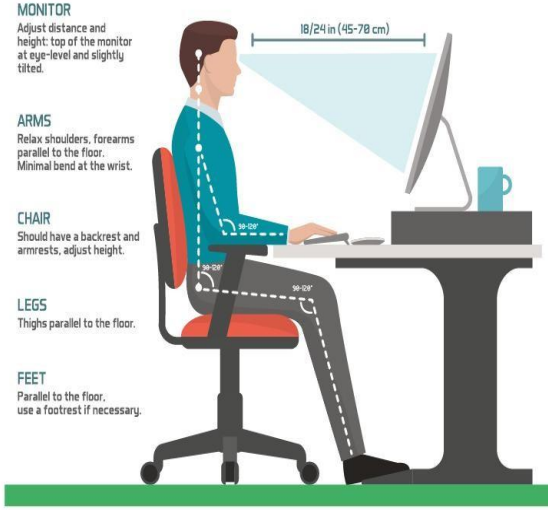
3. Ergonomic hazard

- Ergonomic hazards are physical conditions that may pose risk of injury to the musculoskeletal system, such as the muscles or ligaments of the lower back, tendons or nerves of the hands/wrists, or bones surrounding the knees.
- Ergonomic hazards include things such as awkward or extreme postures, whole-body or hand/arm vibration, poorly designed tools, equipment, or workstations, repetitive motion and poor lighting.

CHECK YOUR BODY POSTURE

WORKING AT DESK

WRONG SITTING POSTURE



CORRECT SITTING POSITION

CORRECT STANDING POSITION

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Classification of Hazard

4. Mechanical hazard

- A mechanical hazard is any hazard involving a machine or industrial process. Motor vehicles, aircraft, and air bags pose mechanical hazards.
- Compressed gases or liquids can also be considered a mechanical hazard.

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Classification of Hazard

5. Physical hazard

- A physical hazard is a naturally occurring process that has the potential to create loss or damage.
- Physical hazards include:
  - earthquakes,
  - floods,
  - fires,
  - and tsunami.

- Physical hazards often have both human and natural elements.

Classification of Hazard

5. Physical hazard

- Another physical hazard, X-rays, naturally occur from solar radiation, but have also been utilized by humans for medical purposes.
- However, overexposure can lead to cancer, skin burns and tissue damage.

Classification of Hazard

6. Psychological hazard

- Psychological or psychosocial hazards are hazards that affect the psychological well-being of people, including their ability to participate in a work environment among other people.
- Psychological hazards are related to the way work is designed, organized and managed, as well as the economic and social contexts of work and are associated with psychiatric, psychological and physical injury or illness.

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Classification of Hazard

7. Anthropogenic hazards

- Hazards due to human behaviour and activity.
- The social, natural and built environment are not only at risk from geophysical hazards, but also from technological hazards including industrial explosions, release of chemical hazards and major accident hazards (MAHs).

Examples of Anthropogenic hazards

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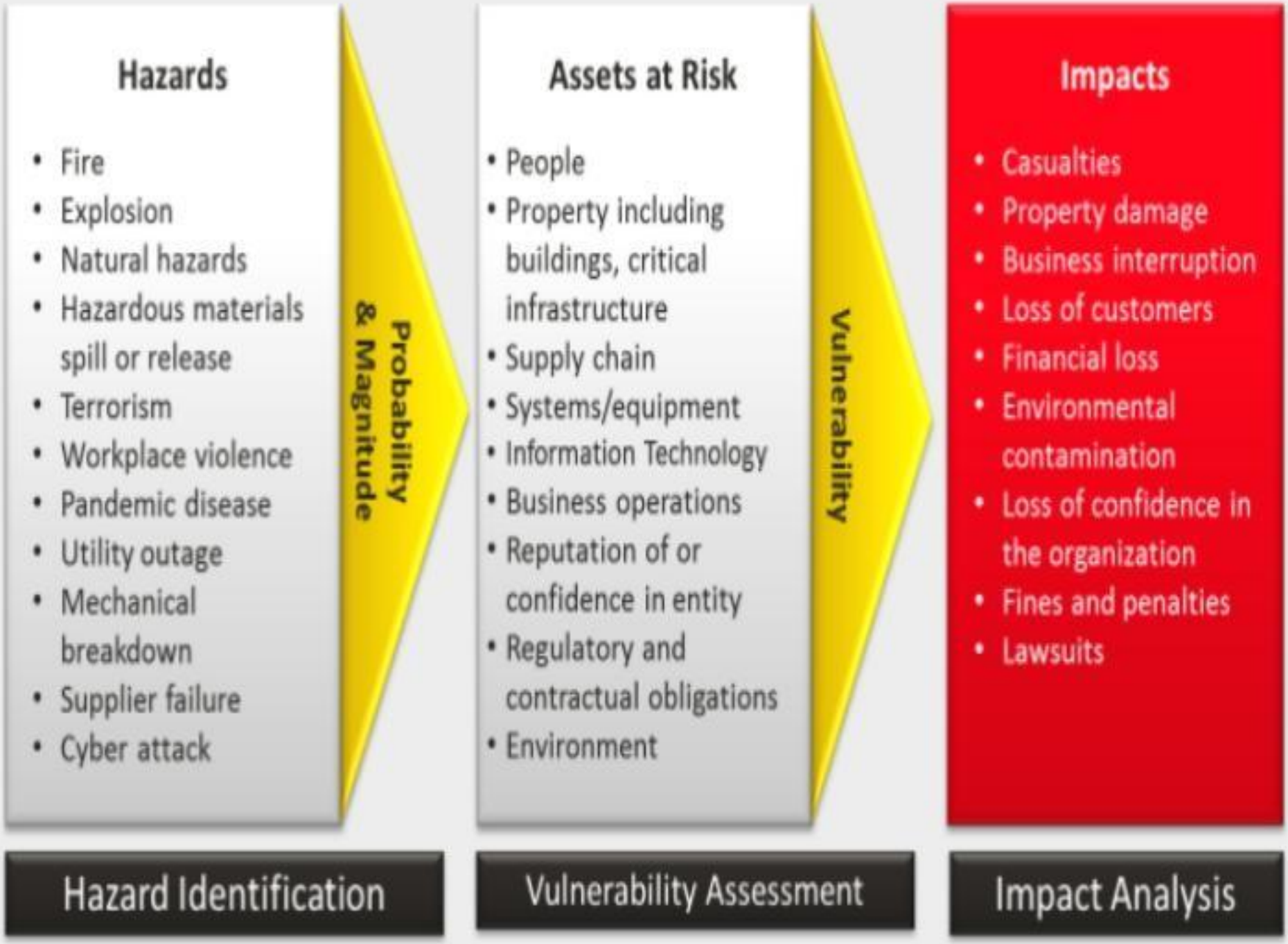
Status of a Hazard

- Hazards are sometimes classified into three (3) modes or statuses:

1. **Dormant** – The situation environment is currently affected. For example, a hillside may be unstable, with the potential for a landslide, but there is nothing below or on the hillside that could be affected.
2. **Armed** – People, property, or environment are in potential harm's way.
3. **Active** – A harmful incident involving the hazard has actually occurred. Often this is referred to not as an "active hazard" but as an accident, emergency, incident, or disaster.


Hazards
Fire
Explosion
Natural hazards
Hazardous materials spill or release
Terrorism
Workplace violence
Pandemic disease
Utility outage
Mechanical breakdown
Supplier failure
Cyber attack
Probability & Magnitude
Assets at Risk
People
Property including buildings, critical infrastructure
Supply chain
Systems/equipment
Information Technology
Business operations
Reputation of or confidence in entity
Regulatory and contractual obligations
Environment
Vulnerability
Impacts
Casualties
Property damage
Business interruption
Loss of customers
Financial loss
Environmental contamination
Loss of confidence in the organization
Fines and penalties
Lawsuits
Hazard Identification
Vulnerability Assessment
Impact Analysis

Marking of Hazards

- Hazard symbols or warning symbols are easily recognisable symbols designed to warn about hazardous materials, locations, or objects.
- The use of hazard symbols is often regulated by law and directed by standards organisations.
- Hazard symbols may appear with different colours, backgrounds, borders and supplemental information in order to specify the type of hazard and the level of threat (e.g. toxicity classes).

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List of common symbols [edit]

Type of hazard	Unicode glyph	Unicode	Image
Generic caution	⚠	U+26A0	
Poison	☠	U+2620	
Ionizing radiation	☢	U+2622	
Radiation – high-level source			
Non-ionizing radiation			

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Biological hazard	☣	U+2623	
Carcinogen			
High voltage	⚡	U+26A1	
Laser hazard			
Chemical weapon			

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Skull and crossbones, a common symbol for poison and other sources of lethal danger (GHS hazard pictograms).

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OCCUPATIONAL HEALTH - COMMON HAZARDS IN THE WORKPLACE

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Thank you

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