

TOPIC 12

Health and safety principles and coverage

12.4 Risk assessment



PowerPoint 4:
Hazards in manufacturing
and engineering



Objectives

By the end of this session, learners should be able to:

01



explain the concept of SFAIRP

02



describe common hazards that can lead to industrial accidents and injuries if appropriate precautions have not been taken.



'So far as is reasonably practicable'

The term **so far as is reasonably practicable (SFAIRP)** is used in the **Health and Safety at Work Act (HASAWA)**. HASAWA imposes a duty on **employers** to ensure, SFAIRP, the health, safety and welfare at work of all their employees.



Employers will need to demonstrate that they are **reducing risk SFAIRP**.



They will need to consider **each** risk and decide whether guarding against it is reasonably practicable in terms of the **time, money and trouble required**.



An employer would not be expected to eliminate **all** the risks that employees are exposed to, because it would be **impossible to remove all risks completely**.



Key point:

SFAIRP means doing what is reasonable in the circumstances to reduce risk, taking account of the effort, cost and level of risk.



SFAIRP

Determining that a risk has been reduced so far as practicable as required by the regulations is a process of **balance**.

Which of these examples would be considered SFAIRP?



**Spending £1 million to
prevent one person working
at height on a task?**



**Spending £1 million to
prevent a major explosion
that may kill 150 people?**



Hazards in manufacturing and engineering contexts

Manufacturing and engineering workplaces have some features that can be dangerous if proper care and attention is not paid to safe ways of working. Consider the following that could be encountered in manufacturing and engineering contexts:



equipment and tools



stored energy



electricity



harmful substances, such as corrosive materials or harmful gases



challenging working environments
(working at height, below ground, with noisy machinery, vehicles, furnaces etc).



Causes of common industrial injuries

Within engineering and manufacturing, the HSE has identified the following common causes of industrial injuries:



exposure to or contact with a harmful or hot substance or object



fires and explosions



falls from height



workplace transport



slips and trips



being struck by an object.

Let's look at some examples.



Exposure to or contact with a harmful substance

Case study



A spillage of **titanium tetrachloride** occurred when a heat treatment furnace was serviced.



The engineer was not wearing **appropriate PPE** and was unaware of the correct **emergency procedures**.



By applying water to the spillage, he increased the amount of hydrogen chloride generated. An extractor fan exhausted the fumes into the yard of a neighbouring firm during a break, resulting in **66 people** being taken to hospital.



Fires and explosions



Case study

A fire occurred at a trichloroethylene vapour-degreasing tank when the solvent level fell to such an extent that the accumulated grease/oil overheated.

The low solvent level indicator was defective, so the operator, who had left the tank unattended, was unaware that manual topping up was required.



Struck by an object



Case study

An employee lost the sight of an eye when he was hit by a piece of swarf (metal filing). He was using a compressed air line to clean metal cabinets prior to powder coating, but was not wearing eye protection.

Inadequate consideration had been given to safer alternatives, such as vacuuming.



Key lesson: Use eye protection and consider safer cleaning methods, such as vacuuming.



Pause to discuss: common injuries



In small groups, discuss the various types of **common industrial injury**.



What can be done to **prevent them**?



