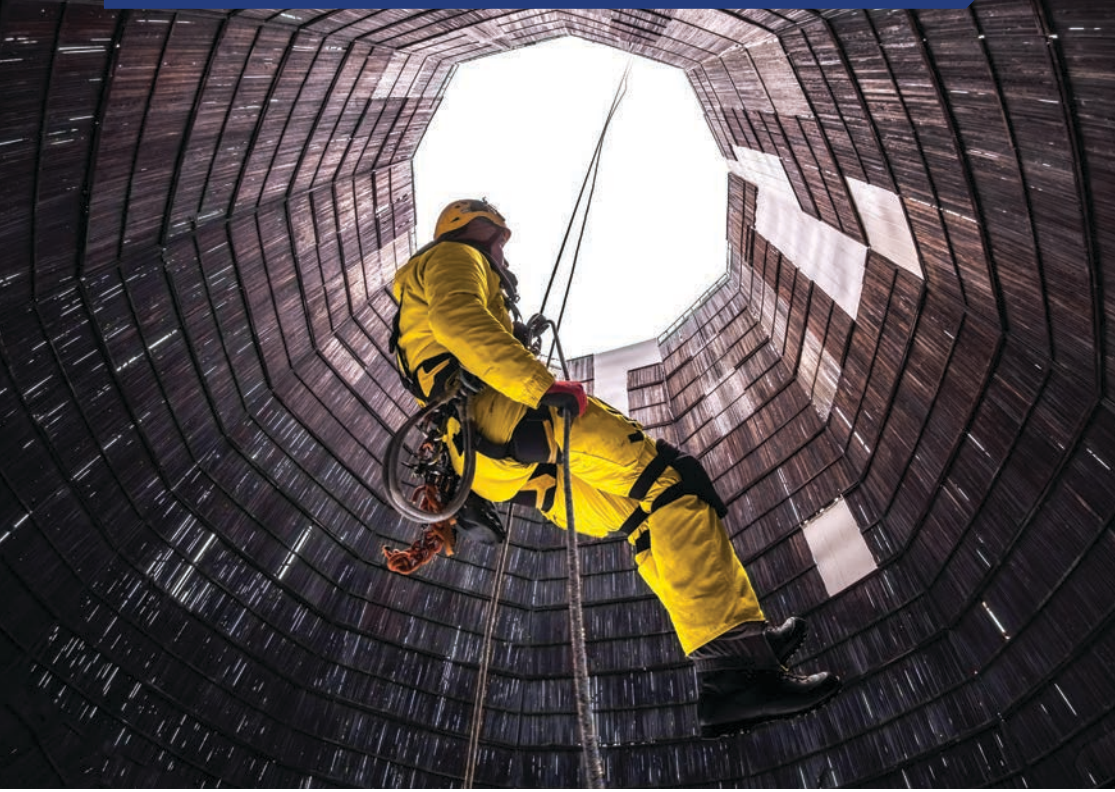
Health and Safety at Work

A course book for the NEBOSH Health and Safety at Work Award



Award

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Contents

Foreword 4

Guide to using this book as part of a taught course 5

Chapter 1 Why and how you manage health and safety 7

1.1 Moral, legal and financial reasons and benefits for managing health and safety 8
1.2 Managing health and safety consistently well 17

Chapter 2 Dealing with common workplace hazards 27

2.1 General workplace 28
2.2 Work-related violence and aggression 32
2.3 Mental ill-health 34
2.4 Hazardous chemicals and substances 37
2.5 Computers 42
2.6 Substance abuse 43
2.7 Electricity 45
2.8 Fire 47
2.9 Manual handling 52
2.10 Noise and vibration 56
2.11 Work equipment 59
2.12 Work at height 63
2.13 Workplace transport 67

Chapter 3 Stopping incidents and ill-health before they happen 73

3.1 Inspecting the workplace 74
3.2 Risk assessment theory 75

Chapter 4 Learning from incidents 91

4.1 Why incidents need to be investigated 92
4.2 A simple approach to investigations 93

Guide to using this book as part of a taught course

This course book is designed to support the NEBOSH Health and Safety at Work Award (HSA).

The content is divided into clear chapters that reflect the structure of the syllabus. Each chapter introduces the syllabus content and sets out the relevant learning outcome.

The chapters include case studies, structured activities, and study questions designed to support learning and reinforce application in the workplace. Each of these is presented so they are easily identifiable. Examples and explanations follow.

Definition

Safety culture can be defined as those sets of norms, roles, beliefs, attitudes and social and technical practices within an organisation which are concerned with minimising the exposure of individuals to conditions considered to be dangerous.

Definition of key terms

Case study

A young worker was seriously injured when he was run over by a forklift truck while helping to empty waste bins at the docks. The forklift truck was moving a pallet of waste bins whilst the worker was standing on the pallet. Loose ratchet straps from these bins got caught in the forklift truck wheels, the worker's foot caught on a strap and he was pulled to the ground. The forklift truck then drove over his foot. He suffered a broken ankle and required skin grafts during a nine day hospital stay.

Practical examples that illustrate the points being discussed.

1.1 Moral, legal and financial reasons and benefits for managing health and safety

Most companies have limited resources, in terms of money, people and time. So sometimes it can be hard to convince management to spend money on health and safety. There are three compelling arguments that can be used to persuade them that managing health and safety is the best thing for business:

- moral;
- legal; and
- financial.

1.1.1 Moral reasons: 'doing the right thing'

Organisations don't usually injure their workers on purpose. They try to 'do the right thing'. This is known as a moral, ethical or humanitarian reason.

Society takes the view that suffering as a result of poor health and safety standards is unacceptable and should be prevented whenever possible. Society expects that workers should leave work at the end of the day in the same condition as when they arrived – being injured or becoming ill as a result of the work a person does or the workplace they attend is morally unacceptable.

Every day, across the world, people die because of work-related incidents or work-related diseases. It is estimated there are about 2.9 million deaths each year.[1]

This total is just for deaths. Latest estimates are that there are around 402 million non-fatal work-related injuries each year that have resulted in each injured person taking more than four days of absence from work.[2]

Injuries and illness don't just affect the workers; their families and friends are affected too.

Many – if not all – of these injuries and diseases are preventable.

Figure 1: Worker supports injured colleague
Credit: Chokniti-Studio/Shutterstock.com

1.1.2 Legal reasons

Moral principles often get written down as laws. Breaking laws can have serious consequences, and health and safety law is no exception.

Health and safety law

Most countries have laws that punish organisations that don't do enough to protect workers (and others such as contractors and visitors) from getting injured or becoming ill at work. Punishment can take the form of fines or even prison. Organisations may also have to pay financial compensation to the injured person.

Organisations that comply with the law are less likely to face prosecutions and compensation claims.

The law places most of the responsibility on the organisation, as their activity creates most of the risk. Organisations have a duty to take care of the health, safety and welfare of their workers (when at work) and also of other people – such as visitors or members of the public – who might be affected by their activities.

But the law also recognises that many other parties need to work together to ensure acceptable standards in the workplace, for example:

- individual workers (including supervisors and managers);
- landlords of workplaces; and
- designers, manufacturers and suppliers of equipment and substances used for work.

Enforcement

The law sets minimum standards, but it isn't very useful unless it is enforced. Health and safety law is enforced by regulatory authorities (sometimes called enforcement agencies or labour inspectorates). They employ enforcement officers (or labour inspectors) that visit organisations. One of their jobs is to check that organisations are complying with the law and take action when they are not. The legal actions they can take can vary depending on the country, but here are a few common approaches:

- **Enforcement notices** – these are formal documents issued by the enforcement officer. These can be issued immediately, without the need to wait for a lengthy legal process. There are two basic types of enforcement notice:
  - The first type requires an organisation to make improvements within an agreed period of time (such as, make improvements to segregation of vehicles and pedestrians in a busy warehouse).
  - The second type immediately stops a dangerous activity (such as, a dangerous piece of machinery must not be operated until it has been made safe).

If the organisation ignores these notices there can be serious consequences, for both the organisation and the individual (such as prosecution).

2.8 Fire

A fire in the workplace could lead to the building being closed temporarily or being completely destroyed. Some businesses never recover from a fire and workers lose their jobs as a result. Fires can be caused accidentally by many things but also deliberately (arson). Deliberate fire starting is the most common cause of fires across workplaces.

2.8.1 The fire triangle

For a fire to start three elements are needed:

1. Heat – for example, from a hot surface, spark or friction.
2. Fuel – for example, paper, wood or petrol/ gasoline.
3. Oxygen – already present in the air but can also be provided by 'oxidising' chemicals or cylinders of oxygen (such as in hospitals or in welding equipment).

These three elements are known as the 'fire triangle': if one of these elements is removed, the fire will go out.

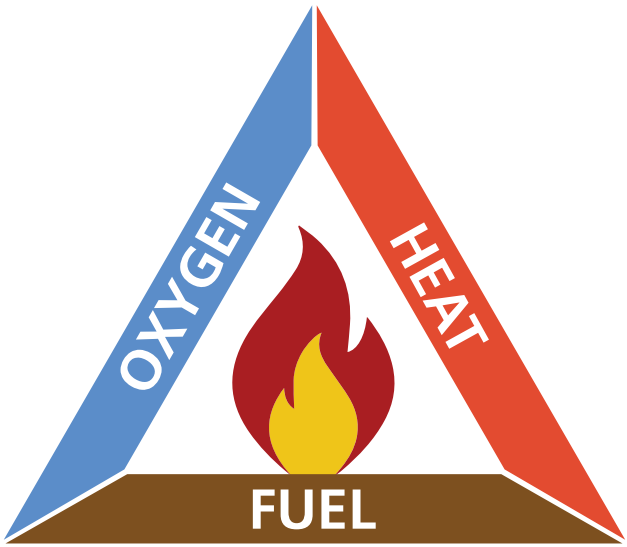

Figure 5: The fire triangle

2.8.2 Classification of fires

Fires are classified according to the fuel source. Different countries use different classification codes. Some of those used in the UK and Europe are shown in Table 1.

Classification	Characteristics	How it is extinguished			
A	Fires of solid materials such as paper, wood, coal and natural fibres. These fires usually produce embers.	Water	Wet chemical	Foam spray	ABC powder
B	Fires of flammable liquids or liquefied solids such as petrol, oil, grease, fats and paint.	Carbon dioxide		Foam spray	ABC powder
C	Fires of gases or liquefied gases such as methane, propane, butane and mains gas.	Gas fires should not be extinguished; this may leave unburned gases as an explosion risk.		Turn off the gas supply.	
D	Fires where the fuel is a metal such as aluminium, sodium, potassium or magnesium.	Special extinguishing media are required depending upon the metal involved.			
F	Fires fuelled by cooking fats, such as deep-fat frying.		Wet chemical		

Table 1: Some UK classifications of fires and their corresponding extinguishing media

Figure 6: Kitchen fire
Credit: Hot Pixels Photography/Shutterstock.com

2.8.3 Heat transmission and fire spread

Fires spread in four ways: convection, conduction, radiation and direct burning.

Convection

Heat rises upwards. This means hot gases from a fire can easily travel upwards in a building (inside or outside) causing the upper floors to get very hot and catch fire.

Conduction

Metals are excellent conductors of heat. For example, if you put the end of a metal spoon in hot water, this part will heat up first and transfer the heat to the rest of the spoon. In a fire, heat is transferred by conduction along metal girders and beams, resulting in the spread of fire throughout buildings.

Radiation

Hot materials transmit a lot of radiant heat. This can transfer heat from one material to another. This means that something can heat up enough to catch fire even if it is not touching the heat source.

Direct Burning

This occurs when a material which is on fire touches another material, causing it to catch fire. A good example of direct burning is of a lit match falling onto a sofa, causing it to ignite.

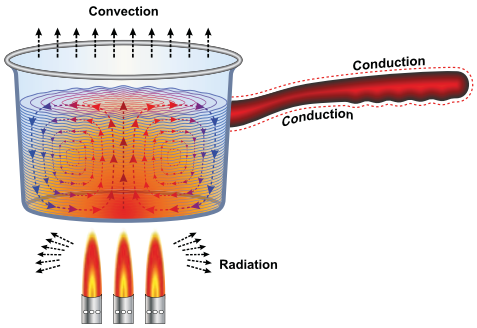

Figure 7: Depiction of three of the four methods of heat transmission and fire spread
Credit: Fouad A. Saad/Shutterstock.com

3.1 Inspecting the workplace

Inspections are an important method of checking; they include inspections using checklists, safety sampling or a simple walk round, looking for unsafe acts and conditions. Inspections should be carried out by a competent person.

3.1.1 Using checklists

Checklists can help when inspecting a workplace or a piece of equipment. A checklist could be created by looking at where previous incidents have occurred, or if a trend has been spotted in reported incidents a checklist could be focused in that key area. It is also beneficial to create a plan for carrying out inspections so they are not only done once. A plan can also indicate which part of the workplace or piece of equipment is to be inspected.

Inspectors:	**Date:**		
	(O) Satisfactory (X) Requires action		
	Location	Condition	Comments
Floors			
Is there loose material, debris, worn carpeting?			
Are the floors slippery, oily or wet?			
Stairways and Aisles			
Are they clear and unblocked?			

Figure 1: Example inspection list[1]

There are advantages (strengths) and disadvantages (weaknesses) to using a checklist when doing an inspection.

Advantages:
- Checklists help with the consistency of inspections, especially when using different competent inspectors.
- The inspection is more structured and a checklist can be used as part of the inspection planning process.
- It helps to ensure that important issues will not be missed.

Disadvantages:
- The inspection could become a 'box-ticking' task leading to a lowered perception of risk if people become too familiar with the contents of the list.
- The checklist may not be regularly reviewed; therefore, new hazards and risks (for example, from new processes or new equipment) may be missed.

3.1.2 Talking to people

Interviewing or talking with workers (perhaps during an inspection) is a very effective way of checking:

- what workers know about the processes they are following; and
- how they feel about them, for example, if they feel that they create a safe working environment.

Workers who are involved in the development and improvement of processes are more likely to understand and follow them.

Application 8

Think about how risk assessments are done in your organisation. Do you think the people who do the risk assessments know enough about the risks they are assessing? Do you think the right people are involved in the risk assessment process?

Effective risk assessment relies on people having specific knowledge of the activity, equipment or situation being assessed. Sometimes this might involve a small team of people with different skills. Without the necessary understanding, significant hazards may go unnoticed and nothing will be done to control them.

3.2 Risk assessment theory

3.2.1 Definition of 'hazard', 'risk' 'risk assessment' and 'control measure'

We assess risks throughout our day, often without thinking about it. For example, driving quickly across a busy junction. In this element, we look at a systematic approach to risk assessment. Explanations of some commonly used terms in risk assessment follow:

- **Hazard**: something with the potential to cause harm, which can include articles, substances, plant or machinery, methods of work, the working environment and other aspects of work organisation.

  Hazards are often described either by referring to the type of harm or effect they lead to (for example, mechanical machinery hazards such as crushing, entanglement or even slips, trips or falls) or by the hazard origin or source (for example, electrical or noise).