9 HEALTH AND SAFETY

9.1 Vocabulary

fixed phrases • health and safety terms

A Match the words to make fixed phrases.

1	emergency	d	**a**	leak
2	first		**b**	measures
3	gas		**c**	restriction
4	fire		**d**	button
5	safety		**e**	force
6	accident		**f**	extinguisher
7	speed		**g**	report
8	centrifugal		**h**	aid

B Study the words and phrases in the blue box.

1 Complete each phrase in column 2 with a word from column 1.

2 Which phrase can you use to:

- agree only partly with a point
- begin talking about several points
- talk about a particular example
- introduce the first of two ideas
- introduce the second of two ideas
- focus on the point which the writer/speaker thinks is the most important
- give a reason for a point
- mention an idea
- talk about certain circumstances

1	2
a	… start with
to	… people think
the	on … other hand
some	to … extent
many	on … one hand
this	… real question is
that	on … grounds that
	in … case like this
	in … sort of situation

C On the opposite page are some people who have an interest in health and safety.

1 What is each person's connection with health and safety?

2 What aspects of health and safety is each person interested in? Why?

3 Match each person with the correct quote (A–F).

4 Replace the words in italics with a phrase from Exercise B.

D Read the extract from the Hadford University handout about health and safety at work on this page.

1 Match the blue words in this extract with the definitions on the opposite page.

2 Use your dictionary to check words you do not know.

E Complete the table on the right and add the stress markers.

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- Risk assessments are an essential health and safety tool because they force managers and employees to consider all the risks involved with a particular operation or procedure.
- Adequate training and supervision, as well as protective clothing and other equipment, mean that employees can deal safely with significant hazards.
- Machinery should be designed to fail safe; for example, a device that still functions as intended even with loss of power.
- Inspection and maintenance systems are vital to ensure that plant and machinery remain in a safe condition.
- Non-compliance with safety regulations could result in an emergency and the company might be accused of negligence as a result.

Base form	Other related forms	
assess	assessment	assessor
catastrophe		
equipment		
investigate		
law		
leak		
prevent		
protect		
report		
system		

A 'The rail was damaged and the train was travelling at 180kph. *When this happens*, the rail will break and the train will crash.'

B 'An oil rig is a dangerous place. *Firstly*, we're out in the middle of the North Sea.'

C 'The company had provided lots of fire extinguishers, *but* it hadn't asked us to check fire safety.'

D '*They say* that the service provided by Britain's railways has improved. I *don't agree completely.*'

E 'I am responsible for the health and safety policy in my company. *But the important thing is* whether my staff are properly trained.'

F 'We will show that the company was negligent *because* they ignored health and safety rules.'

Definitions

A a factory or building where manufacturing or an industrial process takes place; can also refer to the machinery and equipment involved in manufacturing

B a routine of keeping something (e.g., buildings and machinery) in good working condition so that it can be continually used for its intended purpose; includes inspection, testing, servicing, repair, rebuilding

C a legal term: failure to apply enough care and attention in an area of responsibility, causing unintended injury to another party

D machinery or mechanisms where failure automatically results in a safe operating condition

E when a hazard turns from threat to reality – the risk is immediate and urgent action or assistance is needed

F rules or orders that direct and control procedures or behaviours for such things as safety, fire, traffic procedures, etc.

G dangerous situations where there are significant threats posed to life or health

H refusal or failure to comply with rules or guidelines

I 'personal protective equipment' (PPE) – garments which protect the wearer from chemical, electrical, heat or other potential hazards in the workplace

J an official company procedure and legal requirement: an examination and evaluation of the risks involved in specific work situations that may cause harm to people; usually the first step in managing health and safety in those situations

K the process of determining the condition of something by close examination

L guidance and oversight of those working on a task who may lack the full skills for the task

9.2 Listening

using the Cornell note-taking system

A Study the slide on the right. What questions do you think the lecturer will answer?

B Listen to Part 1 of the lecture.

1 Complete the *Notes* section below.
2 What is the lecturer's story about? Why is it not given in the notes?
3 Complete the *Summary* section.
4 Answer the *Review* questions.

C Create a blank Cornell diagram. Listen to Part 2 of the lecture.

1 Complete the *Notes* section.
2 Write some *Review* questions.
3 Complete the *Summary* section.
4 Were your questions in Exercise A answered?

D Study the phrases in column 1 of the blue box. Listen to some sentences from the lecture. Which type of information in column 2 follows each phrase?

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Health and Safety in the workplace (Lecture 1)

- Introduction: principles of health and safety in engineering
- Case studies: oil rig disasters
- Case study: rail disaster

1	2
1 So it should be clear that …	a developing trend
2 It could be argued that …	information about a point the speaker will make later
3 As we shall see …	a statement the speaker agrees with
4 Increasingly we find that …	a conclusion
5 Research has shown that …	an idea the speaker may not agree with
6 It's true to say that …	

Review	Notes
Purpose of H&S at work is …?	Principles of H&S in w/place: managers' legal duty - to protect employees' H&S (risks) + good for business; employees also have a duty of 'reasonable care' towards themselves and others.
7 main duties are …?	7 main duties for managers re. safety: 1. risk assessmt.: identify safety implications before _____ set up 2. design for safety (machinery, structures, etc.): e.g., machine stops if _____ 3. maintenance of plant & machinery
3 rules for matls. & substances are …?	4. matls. & substances: store, move, use safely (∵ dangerous gases → possible _____)
3 types of assistance when problems occur are …?	5. immediate assistance when probs. occur: * hazards & emergency _____ → indicated at point of risk * know who _____ officers are * emerg. procedures - established + _____
Consequences of serious incidents are …?	6. report & investigate all incidents promptly: * minor incidents → avoid serious incident in future * serious incidents (i.e., loss of life) → _____ officers involved → may be legal enquiry + _____
Possibly most important duty is …?	7. trng. + _____ (most imp.?) → for both normal + unusual situations
Summary	

9.3 Extending skills

recognizing digressions • understanding source references

A Study the words and phrases in box a.

1 Mark the stressed syllables or word.
2 Listen and check your answers.
3 Which word or phrase in each group has a different stress pattern?

B Study the phrases in box b.

1 Do the phrases show a digression (start or end) or a relevant point? Write **D** or **R**.
2 Look at the **D** phrases. Do they start or end the digression?

C Listen to the final part of the lecture from Lesson 9.2.

1 Take notes using the Cornell system. Leave spaces if you miss information.
2 What topic does the lecturer mention that is different from the main subject?
3 Why did the lecturer mention this topic?
4 What is the research task?
5 Compare your notes in pairs. Fill in any blank spaces.
6 Complete the *Review* and *Summary* sections.

a

1 supervision, non-compliance, emergency, regulation, implication
2 power station, chemical plant, steel works, factory floor
3 risk assessment, training tool, confined space, fire brigade, safety check
4 explosive, flammable, adequate, pressurized, dangerous

b

Now, where was I?
It's the first of these points that I'm going to focus on now …
By the way, …
So to get back to the main topic …
I have a little story to tell you …
If we move on now to …
You don't need to take notes on this …
The point of that story was …
If we turn now to …
When we look at safety regulations we'll find …

D What information does the lecturer provide about sources? Listen to the extracts and complete the table below.

	Extract 1	Extract 2	Extract 3
Name of writer			
Title and date of source			
Location			
Type of reference			
Relevant to …?			
Introducing phrase			

E Use your notes to write 75–100 words about the health and safety principles ignored in the Hatfield train crash.

F Work in groups. Study the five engineering accidents in box c. Choose one you would like to find out more about and then discuss these questions.

1 What kind of information will you need to find?
2 What ideas do you already have ?
3 Where can you go to find more information?

c

The Great Sheffield Flood, 1864
The Buncefield Chemical Explosion, 2005
The Windscale Fire (nuclear reactor), 1957
The Chernobyl Nuclear Disaster, 1986
The St. Francis Dam Disaster, California, 1928

9.4 Extending skills

making effective contributions to a seminar

A Look at the words in the blue box. Identify their stress patterns.

disaster equivalent explosion
facility pressure processing
reactor repair substance temporary

B Work in pairs.

Student A: Think of good ways to take part in a seminar.

Student B: Think of bad ways to take part in a seminar.

C You are going to hear some students in a seminar. They have been asked to discuss the question: 'What caused the Flixborough chemical plant disaster, and who was responsible?'

1 Listen to the four seminar extracts. Decide whether each contribution is good or poor.
2 Give reasons for your opinion.
3 Think of some more information to add to the good contributions.

D Work in a group of three or four.

1 Discuss your information for your topic in Lesson 9.3, Exercise F. Decide how best to present this information.
2 Present your topic to the whole class.

E Study Figure 1 on this page. What do the pictures show?

F Study the information in Figure 2 on the opposite page. In pairs or groups, discuss the following:

1 What was the cause of the accident (what actually happened?)
2 What other factors were responsible for or contributed to the accident?
3 What health and safety principles were ignored?

Figure 1

What happened?

The Piper Alpha was a gas rig, located in the North Sea off the coast of Scotland, designed to bring natural gas up from under the sea. In 1988, it was destroyed by a fire which killed 167 of the 226 men on board. Most of those rescued survived by sliding down pipes or jumping into the sea hundreds of feet below, which was covered in burning oil. It is still the world's worst-ever offshore disaster, which cost the company, now defunct, over $4 billion.

Natural gas from underground wells is compressed at all times. Loss of compression for a few minutes would cause serious damage to a rig, so, to fail safe, there are two compressors – A and B. On that day, compressor A was shut down to remove a pressure release valve for maintenance, and the tube was temporarily sealed, several metres above the sight-line. A maintenance report was made, but was filed in the wrong place.

Then compressor B failed, so the manager, with only a few minutes to make a decision, had to decide if compressor A could be used. He did not have the report about the valve in compressor A, because it was wrongly filed, so he assumed that all was safe and compressor A was activated. Pressurized flammable gas escaped from the temporary seal on the compressor, causing an explosion beneath the platform. The emergency stop button was pressed immediately, but the fire walls were weak and the platform caught fire, igniting some oil and then some escaping gas. This caused a larger explosion and set fire to the whole rig, trapping the 226 men inside.

There were other factors that aggravated the disaster. Divers were working under the rig, so the automatic firefighting system was disconnected. In addition, the control room was immediately above the first explosion. Consequently, the managers who *could have* organized an evacuation were killed first.

The public inquiry and 1990 report on the incident, led by Lord Cullen, has become a benchmark for safety on offshore facilities. Among the conclusions, the report highlighted two major failings in safety procedures.

- First, the system for recording maintenance work failed. Without knowledge of the repair to compressor A, the manager decided to reactivate it, which proved to be fatal.
- Secondly, the design of the rig also led to safety problems. The firewalls were inadequate* and the control room was badly located.

The incident was an example of how a chain of incompetence, bad management, disorganization, unlucky coincidences and bad decisions led to a catastrophe.

* In theory, the platform should have been isolated from the flow of oil and gas and the fire contained. But since the rig was originally built for oil, the firewalls were designed to resist fire rather than explosions. The first explosion broke up the firewall and dislodged panels, one of which ruptured a small condensate pipe and created another fire.

Figure 2

Vocabulary bank

Recognizing fixed phrases from engineering (2)

Make sure you understand these phrases connected with health and safety issues.

accident prevention
accident report
breathing apparatus
confined space
cost-cutting
first aid officer
fire hazard
fire inspection
fire prevention
flammable gas
gas detector
health and safety regulations
industrial negligence
legal investigation
loss of life
personal protective equipment (PPE)
plant and machinery
point of risk
risk assessment
safety check
safety measures
speed restriction
training and supervision

Recognizing fixed phrases from academic English (2)

Make sure you understand these fixed phrases from general spoken academic English.

As a result, …
As we shall see, …
Bearing in mind that …
But the real question is …
First of all …
In a case like this, …
In this sort of situation, …
In fact, …
Increasingly, we find that …
It could be argued that …
It's true to say that …
Many people think that …
On the grounds that …
On the one hand, …
On the other hand, …
Research has shown that …
So it should be clear that …
The point of this case is …
To some extent, …
To start with, …

Skills bank

Using the Cornell note-taking system

There are many ways to take notes from a lecture. One method was developed by Walter Pauk at Cornell University, USA.

The system involves **Five Rs**.

record Take notes during the lecture.

reduce After the lecture, turn the notes into one- or two-word questions which will help you remember the key information.

recite Say the questions and answers aloud.

reflect Decide on the best way to summarize the key information in the lecture.

review Look again at the key words and the summary (and do this regularly).

Recognizing digressions

Lecturers sometimes move away from the main point in a lecture to tell a story or an anecdote. This is called a **digression**. You must be able to recognize the start and end of digressions in a lecture.

Sometimes a digression is directly relevant to the content of the lecture, sometimes it has some relevance and sometimes, with a poor lecturer, it may be completely irrelevant. Sometimes the lecturer points out the relevance.

Don't worry if you get lost in a digression. Just leave a space in your notes and ask people afterwards.

Recognizing the start	*That reminds me …*
	I remember once …
	By the way, …
Recognizing the end	*Anyway, where was I?*
	Back to the point.
	So, as I was saying, …

Understanding the relevance	*Of course, the point of that story is …*
	I'm sure you can all see that the story shows …
	Why did I tell that story? Well, …

Asking about digressions	*What was the point of the story about food labelling?*
	Why did the lecturer start talking about note-taking?
	I didn't get the bit about …

Referring to other people's ideas

We often need to talk about the ideas of other people in a lecture or a tutorial. We normally give the name of the writer and/or the name of the source. We usually introduce the reference with a phrase; we may quote directly, or we may paraphrase an idea.

Name and introducing phrase	*To quote Smith …*
	According to Smith … *As Smith points out …*
Where	*in the* 2006 report
What	*this was the worst disaster since …*