



IOSH Working Safely



MODULE 2: DEFINING HAZARD AND RISK

SAMPLE MATERIAL

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Hazard, Risk and Risk Control

Key Information

- A hazard is something with the potential to cause harm.
- Some hazards are obvious to everyone but some require prior knowledge to fully understand.
- Risk is the chance of someone coming into contact with a hazard (in combination with the consequences).
- Risk can be assessed by the process of identifying hazards, evaluating risks and identifying controls to avoid or minimise those risks.
- Risk can be controlled by the introduction of workplace precautions.

In the second module of this course we will take a look at some basic health and safety principles to do with risk. We will look at possible sources of risk, how risk can be assessed and how it can be controlled. As we do this, there are some key words and phrases that we need to understand because they have quite specific meanings.

What is a Hazard?

Jargon Buster

Hazard

Something with the potential to cause harm.

Everyday examples of hazards include:

- A moving car on the road - if you are a pedestrian trying to cross that road.
- Electricity - running through the wires of your kettle or hair dryer.
- A sharp knife in the kitchen.
- The slippery floor of your bath or shower.
- An aggressive dog.
- Food poisoning bacteria - growing on a piece of chicken in a fridge.
- The oven cleaner - stored under the sink in the kitchen.
- Carrying the shopping out of the car and into your house.
- Kneeling on a floor banging nails into floorboards for three hours.
- Fumes from a production process.
- A drilling machine.
- Work-related stress.

Some hazards are physical things that could cause harm because of their physical nature. In the above list, the car, dog, knife, slippery floor and electricity are all **physical** hazards.

When using a drilling machine, it's possible to have a puncture wound from using the drill, or to get caught up in the rotating parts. These hazards are known as **mechanical** hazards.

On the other hand, the oven cleaner is a **chemical** hazard. The food poisoning bacteria are a **biological** hazard and carrying the shopping and kneeling on the floor are **activity** hazards. The fume generated in a production process can be an **environmental** hazard and **organisational** hazards occur when employees are subjected to bullying or harassment or even work-related stress when at work. These are known as **non-mechanical** hazards.

When we think about the types of harm that the hazards listed above could cause, it is clear that some would cause injury and some would cause ill-health or disease. For example, the food poisoning bacteria do not cause immediate injury; instead they cause sickness and diarrhoea 24 to 48 hours after you eat the contaminated piece of chicken. That's an ill-health effect.

If we turn our attention to the workplace, there are thousands of hazards that might exist.

Stop and think for a moment about the things with the potential to cause harm in **your** workplace.



Module 2: Defining Hazard and Risk

Typical examples of workplace hazards would include:

- Fire.
- Moving vehicles.
- Manual handling.
- Slip and trip hazards.
- Falling objects.
- Working at height.
- Noise.
- Chemicals.
- Biological agents.
- Electricity.
- Violence.
- Vibration.
- Dust.
- Poor posture.
- Exposure to radiation.

Identifying Hazards

Identifying hazards is often easy since the hazards are obvious. In fact, you might say that it's just common sense.

However, in some cases, hazards can be difficult to identify unless you have prior knowledge. For example, carbon monoxide gas (also known as 'the silent killer') is a colourless, odourless, tasteless gas which is lethal at low concentrations. It can't be detected by our senses and so you would first know of its presence when you start to suffer the symptoms of exposure (headache, nausea, drowsiness). Common sense won't help you here unless you have prior knowledge. Another hazard that is often not easy to see is dust. Asbestos is one of the most dangerous dusts; some fibres are so small we can't see them without a microscope, and inhaling these tiny fibres can be fatal.

There are various ways for identifying hazards in your workplace:

- Use your eyes and other senses.
- Use other people's knowledge and experience.
- Look at the risk assessment.

On that last point - all workplaces have a legal obligation to carry out a risk assessment on their work activities. This risk assessment should clearly identify the significant hazards that workers and other people might be exposed to.



Activity

Consider the hazards associated with the use of a vacuum cleaner.

On the next page you can check to see if you have spotted most of them.





Activity Answers

Common hazards associated with the use of a vacuum cleaner.



Electricity



Trip



Dust



Manual handling



Noise

Although the probability of injury from manual handling and noise may be considered as low they are both considered as hazards.



Module 2: Defining Hazard and Risk

What is Risk?



Jargon Buster

Risk

The chance of someone coming into contact with a hazard (in combination with the consequences).

So, risk is the combination of two factors:

- **Chance** – the likelihood that a person will come into contact with a particular hazard so that harm is caused.
- **Consequence** – the foreseeable harm. How bad would it be?

These two factors combine to give us the degree or level of risk. We might then identify the level of risk using words such as 'low risk' or 'high risk'.

For example, a responsible adult making a cup of tea might be described as a 'low risk' activity since they are unlikely to spill boiling water on themselves and, if they did, it is likely to be of little consequence since they will know to run cold water over the burn immediately.

But a 3-year-old child trying to do the same activity unaided might be described as a 'high risk' since they are far more likely to spill boiling water over themselves and, if they did, the consequences are likely to be severe. They don't know how to treat scalds and they can't reach the cold tap even if they wanted to. Exactly the same ideas are used in the workplace when thinking about risk.

Finally, it's worthwhile pointing out that there is no such thing as 'zero risk'!

No activity in life is risk-free. Everything that you do at work and at home exposes you to hazards that create risk. You can be killed or seriously injured by hazards in every room of your house, in your garden, or travelling to and from work. Work is no exception.

Working safely is not about creating a risk-free workplace since such a thing doesn't exist. Instead, working safely is about recognising and then managing the risks inherent in the workplace and work activities.

Assessing Risk

Risk assessment is a simple process that we all do all of the time. We perhaps don't call it risk assessment, but we still do it. We do it without even thinking about it:

- Are there any threats to my safety?
- If there are, what do I need to do about it?

Young children aren't very good at doing this, which is why we need to do it for them to keep them safe.

As you grow up you learn to do this better. You learn how to cross the road safely. You learn how to drive a car safely. You learn how to work on a scaffold safely. This learning might come through education and training, or it might come through experience. Often it comes from a combination of both.

If you don't learn, then you get hurt.

Risk assessment is a legal requirement under the **Management of Health and Safety at Work Regulations 1999**. These regulations require that:

- A risk assessment is carried out by the employer.
- The assessment is recorded if the employer has five or more employees.
- The assessment is reviewed when necessary.

Once an employer has carried out a risk assessment they must tell employees and other workers about the key findings so that workers will understand the hazards and risk involved and the workplace precautions to be used.

It's a very good idea for employers to involve employees in risk assessments because of the exchange of knowledge and experience that happens.

The basic steps of risk assessment are:

- **Identify the hazards** – what are the things with the potential to cause harm?
- **Evaluate the risk** – what is the level of risk and is it acceptable?
- **Identify the controls** – if the level of risk is unacceptable, what needs to be done about it so that the risk is either eliminated or minimised to an acceptable level?

For example, if you were carrying out roadworks on the hard shoulder of a motorway you might acknowledge that passing traffic is one of the most significant hazards. If this is not dealt with in some way, the level of risk would be very high. It would be quite likely that a car moving at high speed would strike a worker, and the worker would probably die of their injuries. The risk is therefore unacceptable and some control measures have to be introduced to reduce the risk down to a more acceptable level. In this scenario, traffic cones, barriers, signs and other workplace precautions would lower the risk down to a more acceptable level. We would have to recognise, though, that there is still some risk that passing traffic might hit a worker.



How Can Risk Be Controlled?

The ideal way to control unacceptable risk would be to eliminate the hazard that creates it. But in many cases this can't be done – it's not realistic. We might then ask the question – if the hazard can't be removed, how can the risk be controlled?

The answer is to use **workplace precautions**.

Workplace precautions are all of the various different types of control measure that can be introduced at work to prevent hazards from causing harm.

There are dozens of different types of workplace precaution available. Here are a few examples:

- A barrier separating pedestrians from vehicle traffic.
- Metal guards on a piece of machinery to prevent accidental contact with the moving parts.
- Palisade fencing around an electrical substation.
- A safety interlock switch on the door of a microwave oven which prevents you from operating the oven with the door open.
- Plastic insulation on the flex of an electric kettle preventing contact with live wires.
- Safe systems of work such as the 'lock out tag out' (LOTO) procedure which can be carried out to allow for safe maintenance work. This system is used to make sure dangerous machines are properly shut off and not started up again until maintenance work is complete.
- Permit-to-Work systems such as a hot work permit which ensures that the correct precautions are in place when someone carries out hot work (such as welding) in a workplace.
- Taking the keys out of the ignition of a forklift truck whenever you leave the truck unattended.
- Using a good lifting technique when carrying out a team lift of a heavy piece of stock metal.
- Personal Protective Equipment (PPE) such as wearing eye protection when using a petrol powered strimmer (PPE will be covered in more detail in Module 4).
- Obeying the safety sign that directs you to walk one way around an obstruction.



A LOTO System.

Workplace precautions that don't rely on people having to do things are the most effective ones, e.g. a barrier outside an exit that stops people walking into a vehicle traffic route is more effective than putting up a warning sign or signpost asking people to remember not to walk into the traffic route.

Workplace precautions that rely totally on people remembering to do the right thing at the right time are the least effective because people are not perfect – they make mistakes.

For this reason, personal protective equipment should be seen as a last line of defence because it relies totally on people remembering to wear it correctly at the right time.

It must be remembered that all workplace precautions have weaknesses. None are perfect. They all require constant checking and supervision to ensure that they are working properly.

Revision Questions

1. What is a hazard?
2. Give an example of a mechanical hazard and a non-mechanical hazard when using a drilling machine.
3. Can all hazards be seen?
4. What is meant by the word 'risk'?
5. Why do employers have to carry out risk assessments?
6. What are workplace precautions?

(Suggested Answers are available at the end of the course.)



Module 2: Defining Hazard and Risk

Summary

In Module 2 we have:

- Defined a hazard as something with the potential to cause harm.
- Explained that some hazards are obvious to everyone but some require prior knowledge to fully understand.
- Defined risk as the likelihood of someone coming into contact with a hazard in combination with the consequences.
- Outlined how risk can be assessed by the process of identifying hazards, evaluating risks and identifying controls to avoid or minimise those risks.
- Explained, with examples, how risk can be controlled by the introduction of workplace precautions.