

## 201: Health and safety in building services engineering

### Handout 3: Hazardous situations

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#### Learning outcome

The learner will:

- understand the requirements for identifying and dealing with hazards in the work environment.

#### Assessment criteria

The learner can:

- describe **situations** which can constitute a hazard in the workplace
- explain practices and procedures for addressing **hazards in the workplace** (inferred through practical).

#### Range

**Situations:** temporary electrical supplies; trailing leads/cables; slippery or uneven surfaces; presence of dust and fumes; handling and transporting equipment or materials; contaminants and irritants; fire; working at height; hazardous malfunctions of equipment; improper use, maintenance and storage of tools and equipment

**Hazards in the workplace:** temporary electrical supplies; trailing leads/cables; slippery or uneven surfaces; presence of dust and fumes; handling and transporting equipment or materials; contaminants and irritants; fire; working at height; hazardous malfunctions of equipment; improper use and storage of tools and equipment; bacteria: Weil's disease

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### Hazardous situations

When working in the building services industry, you will encounter many potentially hazardous situations, all of which can cause you (or others) harm if not dealt with appropriately. Some examples of hazardous situations are given below.

#### Temporary electrical supplies

Each year, in the construction industry, people are killed or seriously injured by electricity. Most of these accidents could be avoided. Construction sites present one of the most challenging environments to the safe use of electricity. Much of the work is done outdoors in all weathers – damp and wet conditions increase the risk and potential severity of shock. Sites are constantly changing as the work progresses, so there is always a temptation to improvise supply systems. Excavations, demolition work and routine construction activities may all result in damage to both the temporary site distribution system and/or the existing fixed installation. Cables and equipment are likely to be damaged by the movement of heavy plant and materials. During installation work sites are often congested, which makes the control of risk more difficult. There may also be confusion as to which parts of the temporary, existing or new installations are live, and which have been made dead. The temporary site distribution system may be used by a wide range of people who often work for different contractors and who will have various needs and expectations. Contractors may provide their own tools and equipment, or use equipment provided by others. Effective management is necessary to ensure that all the equipment is suitable for use and is properly maintained.

#### Trailing leads/cables

In most environments, portable electrical equipment will be used extensively and the leads for this equipment will generally trail across the floor. These trailing leads are obviously a trip hazard and care must be taken when moving about in areas where they can be found. Furthermore, you must ensure that any trailing leads that you use do not, as far as is reasonably practicable, present a trip hazard to others. Additionally, trailing leads, if damaged, can result in a risk of electric shock so care must be taken to ensure that they are not subject to damage. Many tradespeople now use battery-operated power tools which eliminate the need for trailing leads. However, we still need to be vigilant with respect to trailing leads, particularly where portable tool charging stations are situated.

### **Slippery or uneven surfaces**

Falls are a common safety hazard at work, often due to uneven flooring, torn carpet, spills on uncarpeted surfaces and waxed floors. Falls are one of the main reasons for employee compensation filings. In order to prevent falls in your workplace, make sure that all flooring is kept in good repair; mop up spills immediately and place signs on freshly washed or waxed floors.

### **Presence of dust and fumes**

In many work environments there may be dust or fumes present in the atmosphere as a result of the processes being carried out. For example, working in a flour or saw mill means that there is the potential for airborne dust. This can at best be annoying, causing coughing and throat irritation, but some airborne particles can have much more serious consequences if breathed in. The hazard of breathing in MDF dust when it is being cut is obvious, since MDF (medium density fibreboard) uses resins to bond the wood fibres together, which are thought to be **carcinogenic** (causing cancer). Also, the risks from asbestos are now widely advertised and will be dealt with separately in this course. Something that not many people know is the fact that fine dust in suspension in the air can be extremely explosive if ignited. Flour mills are classified as explosive atmospheres and, as electricians, we must ensure that the electrical equipment we install is 'intrinsically safe', ie no spark or ignition, whether caused during normal use or under fault conditions, can ignite the explosive atmosphere outside the enclosure. Fumes from processes can also be extremely hazardous, particularly when materials are heated and burned. The age-old practice of burning off PVC insulation from cables to increase the return on scrap cable should be avoided; burning PVC (polyvinyl chloride) produces dioxins that have been considered highly toxic and able to cause reproductive and developmental problems, to damage the immune system, to interfere with hormones and also to cause cancer.

### **Handling and transporting equipment or materials**

Many injuries happen when handling or transporting equipment or materials on site, which are quite often heavy and/or awkwardly shaped. Do not try to lift items that are beyond your capability and, even if they are within your lifting capability, consider the location or situation. If you have to stretch in order to lift the item you could cause serious injury that could be life-changing. For example, if you sustain a back injury you are likely to suffer with that problem for the rest of your life. Ensure that you always use recognised appropriate lifting techniques, get help when necessary and use lifting aids where possible. Also, be mindful of injuries that could result from the items dropping on your feet, for example, and remember that some items may have sharp edges that could damage your hands.

### **Contaminants and irritants**

This could be any type of atmospheric hazard that causes inflammation or irritation to the eyes, skin or respiratory system. Chemical gases are a type of irritant. There are many forms, which are too numerous to include here. You should be aware of whether they occur in an area you are going to work from appropriate signage and risk assessments, and take the appropriate steps.

### **Fire**

For fire to occur there must be a source of ignition, fuel and oxygen. If all three are present and in close proximity then the fire risk could increase as a result. Potential sources of **ignition** could include:

- naked flames, eg smokers' materials, matches, pilot lights, gas/oil heaters, gas welding equipment, cookers, etc
- hot surfaces, eg heaters, engines, boilers, machinery, lighting (such as halogen lamps), electrical equipment, etc
- hot work, eg welding, grinding, flame cutting
- friction, eg drive belts, worn bearings, etc
- sparks, eg static electricity, metal impact, grinding, electrical contacts/switches, etc
- arson, eg deliberate ignition.

Examples of potential sources of **fuel** (anything that burns is a potential fuel) include:

- solids, eg textiles, wood, paper, card, plastics, rubber, PU foam, furniture, fixtures/fittings, packaging, waste materials, etc
- liquids, eg solvents (petrol, white spirit, methylated spirits, paraffin, thinners, etc), paints, varnish, adhesives, etc
- gases, eg LPG, acetylene.

Your risk assessment should list the potential sources of ignition and fuels that are present in your premises.

### **Working at height**

The greatest proportion of accidents occurring on construction sites are as a result of falls from height, including the obvious falling from ladders, towers and buildings. However, serious injuries can also be sustained by falling from much lower heights, including falls from hop-ups and step ladders. The Work at Height Regulations 2005 were introduced to reduce the risk of injury from falls.

### **Hazardous malfunctions of equipment**

This is a source of workplace safety hazards that can cause serious harm in a short period of time. From simple shredders to forklifts and poorly constructed scaffolding, all employees should be properly trained on how to operate the equipment they use, as well as request repairs as soon as they are needed.

### **Improper use, maintenance and storage of tools and equipment**

This can lead to injuries to those using the tools or to those nearby. The following simple rules will avoid this:

- Use tools for their intended purpose.
- Clean the tools immediately after using them.
- Keep tools in their proper places.
- Always cover sharp pointed tools with cork, or similar.
- Be sure tools are in good working condition before using them.
- Maintain the equipment according to manufacturers' instructions.
- Handle and use tools properly.

### **Bacteria – Weil's disease**

The technical term is **leptospirosis**; it is a type of bacterial infection spread by animals. It is caused by a strain of bacteria called leptospira. In 90% of cases, leptospirosis only causes mild flu-like symptoms, such as a headache, chills and muscle pain. However, in some cases the infection is more severe and can cause life-threatening problems, including organ failure and internal bleeding. In its most severe form, leptospirosis is also known as Weil's disease.

Leptospirosis is spread to humans by animals. You can catch it by touching soil or water contaminated with the urine of wild animals infected with the leptospira bacteria. Animals known to be carriers of the leptospira bacteria include cattle, pigs, dogs and rodents, particularly rats. Bear in mind that when rats and mice are walking along they are constantly urinating so if you are working in an area where there is a possibility of rats, take precautions to ensure you are not infected, eg wear gloves and wash hands before eating, drinking or similar activities.

You may also be at a higher risk if you frequently come into contact with rivers and lakes. This might be because of your occupation or through taking part in activities such as water sports and fishing.

If you may have contracted leptospirosis at your place of work, notify your employer so they can report it. If you're self-employed, you should consult your doctor.