

Safety of People in the Event of Fire



Learning Objectives

Once you've studied this element, you should be able to:

- 1 Explain the purpose and requirements of a fire emergency plan.
- 2 Describe the purpose and content of a fire evacuation procedure.
- 3 Outline the behaviours of people in the event of a fire.
- 4 Outline appropriate training requirements.

Fire Emergency Plan	5-3
Purpose of a Fire Emergency Plan	5-3
Content of a Fire Emergency Plan	5-4
Multi-Occupied Premises	5-5
Why Business Continuity Planning is Required	5-5
Mitigation Measures to Minimise the Environmental Impact of a Fire	5-6
Legal Obligations Related to Environmental Protection	5-6
Pre-Planning the Minimisation of Environmental Impact	5-7
Site and Damaged Area Clean-Up Considerations	5-7
Fire Evacuation	5-9
Evacuation Procedures	5-9
Evacuating Members of the Public	5-13
Behaviours of People in the Event of a Fire	5-15
Principles of Sensory Perception	5-15
The Effect of Time Pressure and Stress on the Decision-Making Process	5-16
Likely Behaviour of Individuals Responsible for Others	5-18
How Heat and Smoke Could Affect Human Behaviour During an Evacuation	5-19
Crowd Movement (Individual and in Groups)	5-19
Appropriate Training Requirements	5-22
Fire Safety Training	5-22
Roles and Responsibilities in an Emergency	5-23
Workers with Management/ Supervisory Roles	5-24
Summary	5-26
Exam Skills	5-27

Fire Emergency Plan

IN THIS SECTION...

- The Fire Emergency Plan ensures that people on the premises know what to do in the event of fire and that appropriate action is taken to allow safe evacuation of the premises.
- All procedures relating to alerting people to a fire emergency, the actions they should take regarding evacuation and arrangements for calling the fire and rescue services should be detailed in the Fire Emergency Plan.
- In multi-occupied premises the plan should be compiled in consultation with all occupiers.
- For the plan to be effective the responsibilities and actions specified must be compatible with the routine use of the premises.
- Sources of pollution in the event of a fire arise primarily from toxic and corrosive smoke, and run-off of contaminated fire-fighting water.
- In their emergency plans, sites should consider the polluting effects of fire. To ensure that fire sites are cleaned up satisfactorily, collected contaminated run-off must be disposed of properly, in accordance with appropriate waste regulations.

Purpose of a Fire Emergency Plan

The purpose of a Fire Emergency Plan is to ensure that the people in premises know what to do if there is a fire, so that the premises can be safely evacuated.

The Fire Emergency Plan provides a training and guidance document which ensures that people understand the actions they need to take in the event of a fire and how to implement the adopted evacuation strategy.

The Fire Emergency Plan:

- Will be derived from the findings of a fire risk assessment.
- Should be recorded.
- Should be made available to relevant persons such as:
 - Employees.
 - Employee representatives (where appointed).
 - Any relevant enforcing authority.

The Fire Emergency Plan will include procedures relating to:

- Fire drills:
 - Workers have the opportunity to become familiar with evacuation procedures without being at risk of a fire and can practise closing windows, isolating equipment, etc. when a real emergency arises.
- Alarms evacuation.
 - Procedures will need to take account of vulnerable people and for people who may need to be encouraged to evacuate because they are in an important meeting or on a telephone conference, etc.
- Roll call.
 - Roll call or verification of the evacuation of the premises is important to ensure that everyone in the premises has been able to evacuate safely.



Preparation of a Fire Emergency Plan is essential for all workplaces

Content of a Fire Emergency Plan

A Fire Emergency Plan should cover a number of issues:

- **How people will be warned:**
 - The type of fire alarm system on the premises.
 - How it alerts people.
- **What action people should take on discovering a fire:**
 - Immediate evacuation of the building.
 - Actions to be taken to deal with the fire.
- **Action people should take in the event of a fire:**
 - Actions necessary to safeguard the situation before following the means of escape to a place of safety.
- **Arrangements for calling the fire and rescue service:**
 - What individuals may have to do to contact the fire and rescue service.
 - Details of any automatic calling system.
- **Isolations:**
 - Any actions required to safeguard the situation by isolating hazardous plant or equipment.
- **Fire alarm activities:**
 - Special actions that individuals might have to take on hearing the fire alarm, e.g. checking alarm panels, disabling lifts, directing people to the exits, preparing vertical, horizontal or phased evacuation, operating the public address/-tannoy systems, providing assistance for the disabled.
- **Evacuation procedure:**
 - Procedure to be followed in order to evacuate the building and assemble at a place of safety.
 - Arrangements to ensure the safe evacuation of any vulnerable persons.
- **Assembly points:**
 - Location and description of designated assembly points.
- **Fire-fighting arrangements:**
 - Provision of both portable and fixed fire-fighting equipment.
 - Details of the individuals expected to use such equipment.
- **Procedures for meeting the fire and rescue service on arrival (including access arrangements):**
 - Designation of persons on duty at the scene of any incident involving a fire and their role in liaising with the fire service.
 - Arrangements for vehicle and building access for the fire service.
- **Provision of information on the incident:**
 - On the contents of a particular building.
 - On any hazardous materials or processes and facilities that might create a risk to fire-fighters carrying out their duties.

- **Vulnerable people and those with disabilities**

Many countries around the world have fire safety legislation that requires the person(s) with responsibility for the building to provide a fire safety risk assessment. It should include an emergency evacuation plan for all people likely to be in the premises, including vulnerable people and those with disabilities. People with disabilities include:

- Electric wheelchair users.
- Wheelchair users.
- Mobility-impaired persons.
- Visually-impaired persons.
- Hearing-impaired persons.
- Those with:
 - Dyslexia/orientation disorders.
 - Learning difficulties/autism.
 - Mental health problems.
 - Dexterity problems.
 - Asthma or other breathing health issues which could be aggravated by smoke inhalation.

Multi-Occupied Premises

In multi-occupied, more complex, premises, the Fire Emergency Plan has to take into account the various groups of persons occupying the premises. It can therefore only be compiled after consultation with other occupiers and those who have control over the building.

This means that, in most cases, for the plan to be effective, a single Fire Emergency Plan covering the whole building will be necessary.

Why Business Continuity Planning is Required

The Fire Emergency Plan provides a training and guidance document which ensures that people understand the actions they need to take in the event of a fire, and how to implement the adopted evacuation strategy. So, for the plan to be effective, the responsibilities and actions specified must be compatible with the routine use of the premises. For example:

- Persons with specific responsibilities must be available at all times or provisions made for deputies.
- Equipment, facilities and means of escape must be available whenever the premises are in use.

Business continuity planning refers to a system that includes policies and procedures to protect an organisation's people, processes and supporting technology. A fire may well destroy an organisation's ability to manufacture goods or services but with appropriate planning continuity can be maintained. This will enable the business to continue with the supply of goods and services, therefore limiting any financial impact from the fire.

If the emergency plan preserves the people, then the continuity plan preserves the business.

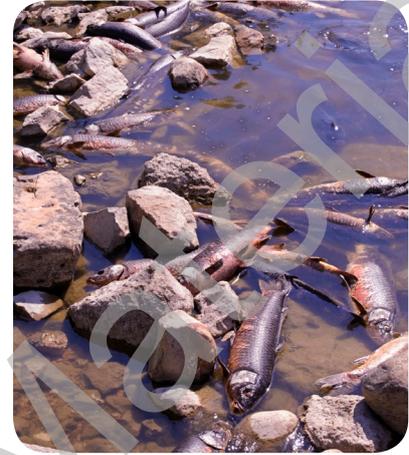


The fire emergency plan should detail the evacuation procedures for the premises

Mitigation Measures to Minimise the Environmental Impact of a Fire

Environmental damage can result from two basic sources:

- Toxic and/or corrosive smoke:
 - The nature of the smoke depends on the fuels being burnt and the extent of the combustion process.
 - Airborne contaminants can later contaminate land, crops and water.
- Contaminated fire-fighting water run-off:
 - Such run-off can carry large amounts of chemicals and make its way into drains, rivers and sewage treatment works.
 - Groundwater contamination may take several months to become apparent, and may persist for many years.



Run-off of contaminated fire-fighting water can have devastating results

DEFINITION

GROUNDWATER

Groundwater is the water present underground in soil-pore spaces and in the fractures of rock formations. A volume of groundwater is referred to as an aquifer when it can yield a usable quantity of water.

Legal Obligations Related to Environmental Protection

There may be local legislation which protects ground and surface water and regulates discharges that might arise from the run-off of contaminated fire-fighting water. For example, UK legislation regulates discharge to surface and ground water, with the law stating:

“A person must not, except under and to the extent authorised by an environmental permit ... cause or knowingly permit a water discharge activity or groundwater activity.”

Source: [Environmental Permitting \(England and Wales\) Regulations 2016 - Regulation 12](#)

A water discharge activity mainly includes discharge to:

- Territorial waters extending to three nautical miles.
- Coastal waters.
- Inland freshwaters, e.g. rivers, streams, lakes, etc.
- Groundwater.

However, it is essential that there is co-operation between fire services and environmental regulators to ensure a co-ordinated effort in the event of fire incidents that have the potential to pollute such controlled waters and the disposal of any associated waste, such as contained, contaminated fire-fighting water run-off.

Pre-Planning the Minimisation of Environmental Impact

Sites should consider the polluting effects of fire in their emergency plans. If a fire occurs, the most likely sources of pollution of groundwater, freshwater or coastal waters are:

- Atmospheric deposition of smoke/vapours.
- Escape of contaminated fire water:
 - Directly to surface run-off into rivers and the ground.
 - Via the site's surface water drainage system.
 - Via the foul sewage system and out unaltered through the treatment works.

To mitigate the effects of an incident, containment methods must be pre-planned, and containment depends on the:

- **Hazardous nature** of substances on site.
- **Risk** of fire.
- **Sensitivity** of the receiving environment.
- **Reasonable practicability** of the solution, such as dimensions of the site and the cost involved.

Permanent Remote Containment Systems

'Built-in' permanent remote containment systems for a site include:

- Lagoons - earth-banked containment basins which are effective at containing fire water run-off provided they are impermeable and incorporate some sort of isolation from the drainage system.
- Purpose-built tanks - to intercept run-off:
 - Can be placed below or above ground.
 - Include as a last resort the possibility of using storm tanks at the sewage treatment works.
- Shut-off valves - to isolate part of a site's drainage system.

Emergency Remote Containment Systems

Emergency remote containment systems (used when permanent solutions are not practicable) include:

- Sacrificial areas - run-off is directed to a designated 'sacrificial' area. This involves use of permeable soil or porous media with an impermeable lining.
- Temporary bunding of impermeable car parks, etc. - using, for example, sandbags.
- Portable tanks and tankers - blocking of the site drainage system to set up a temporary sump from which the run-off can be pumped into the tank; also allows the possibility of re-use of the run-off as fire-fighting water.

Site and Damaged Area Clean-Up Considerations

Having contained the fire-fighting water run-off, the last stage in minimising the environmental impact of fire and fire-fighting operations is to make sure that the area is cleaned up satisfactorily. This will principally rely on ensuring that collected contaminated run-off is disposed of properly, in accordance with the appropriate waste regulations.



Proper disposal of contaminated run-off is essential

TOPIC FOCUS

Pathways by which pollutants from the site of a fire can enter the water ecosystem:

- The surface water drainage system on-site.
- Through the foul drainage system contaminating the sewage works beds.
- By water run-off to ground and into brooks, streams and rivers.
- By airborne contaminants deposited in the precipitation.

Methods of containment for fire-fighting water run-off produced at the site of a fire:

- Bunds.
- Drain covers.
- Mats and sandbags.
- Interceptors.
- Provision of a sacrificial area and/or trenches.
- Diverting and directing the flow of water taking advantage of the lie of the land.
- Secondary containment reservoir or lagoon.
- Portable containers or tanks.

STUDY QUESTIONS

1. What are the key elements of a Fire Emergency Plan?
2. Outline the pathways by which pollutants from the site of a fire can enter the water ecosystem.
3. Outline the means that can be employed to contain fire-fighting water run-off produced at the site of a fire.

(Suggested Answers are at the end.)