

## Safety and Fire

### 1. INTRODUCTION:

In India, every year about 25000 persons die in fires and related causes. The leading causes for these accidents are bursting of gas cylinders or stoves and electrical short circuits. Many of these deaths could have been prevented. A fire can occur at any time at any place. It can cause major disasters and loss of lives in buildings such as offices, hotels, shopping centers, hospitals, schools and homes. Such disasters can be avoided if proper fire safety practices are observed. It is the interests of the community at large that proper attention be paid to fire loss since it is the community in the end which has to pay for all the losses. Insurance company's may be paying for a part of the damage, but can only do so out of the premium collected out of the insured.

A major fire can bring a business to a halt. Fires are caused almost entirely by people, either through their actions, which may be accidental or deliberate and malicious or through their failure to take appropriate precautions such as, for example, the regular inspection, maintenance and repair of defective equipment. To mitigate the fire, the first step, the management should take is to identify the fire risks. The successful prevention of fire loss depends almost entirely on the management of the business. Fire create total waste. Such waste would not be tolerated by efficient management, if it resulted from inefficient operation. This article will focus on the characteristics and elements of fire, potential **fire hazards**, measures to be followed for **fire preparedness**, fire protection and evacuation procedures.

## 2. CHARACTERISTICS OF FIRE:

In order to protect yourself from fire, it is important to understand the basic characteristics of fires. A fire has many characteristics and some of them are listed below:

- A fire can occur at any time.
- Short circuit is one of the leading cause of fire.
- In just two minutes, a residence can be engulfed in flames.
- The water is the best medium to fight fires except electrical and oil fires.
- Most deaths due to fire occur at night when people are sleeping.
- Fire produces gases that make you drowsy.
- Smoke and poisonous gases are the primary killer in fires.
- Instead of being awakened by fire, you may fall into a deeper sleep.
- Asphyxiation is the leading cause of fire deaths exceeding burns.
- Heat and smoke from fire can be more dangerous than the flames.
- Inhaling the super hot air can sear your lungs.
- Pouring water on electrical or oil fires will be dangerous.

## 3. ELEMENTS OF FIRE:

A majority of fires can be prevented. Any **fire prevention** programme is built around the knowledge of basic elements of fire. Fuel, Air (oxygen) and Heat (ignition source) must exist together for a fire to exist which is popularly known as the science of the fire triangle. Without any one of these elements, a fire is not possible. “Un-inhibited Combustion Chain Reaction”, is also considered as fourth element for certain types of fires especially chemical fires.

### The source of these elements can be:

- A source of fuel is anything that can burn a potential fuel for a fire. The examples are coal dust, wood, paper, plastics, waste materials, mineral oils, diesel, some explosives, etc.
- A source of ignition is anything that has potential to get hot enough to ignite a material, substances in the home or workplace. The examples are electrical sparks, hot surface from electrical equipment, short circuits, spontaneous heating of coal, hot work, smokers material (cigarettes, lighters, matches), candles, explosives, detonators, etc.
- The main source of oxygen for a fire is in the general body of air.

#### **4. POTENTIAL FIRE HAZARDS:**

The best measures to be adopted for the prevention of a fire is to eliminate potential fire hazards. Therefore you need to know what fire hazards are and what you should do to remove them from your home or workplace. Some potential **fire hazards** are listed below:

- Electric wiring in poor condition.
- Electric system that are overloaded, resulting in hot wiring or connections, or failed components.
- Storage of flammable liquids.
- Storage of combustibles with insufficient protection.
- Storage of combustibles near equipment that generate heat, flame or sparks.
- Smoking of cigarettes, cigars, pipes, beedees, etc.
- Ignition sources such as candles, lighters, matches, etc.
- Equipment that generate heat and utilizes combustibles.
- Use of cooking appliances, stoves, furnaces, boilers, heaters, ovens, etc. disregarding safety guidelines.
- Poor housekeeping practices.

#### **5. FIRE PREPAREDNESS:**

**Fire preparedness** is an important aspect to be looked for preventing any fire. For prevention of fires in your building, you have to adopt a number of measures in advance and some of them are listed below:

- Provide atleast two exits for your building.
- Fix fire exit labels and signs on the corridors and lift lobbies.
- Display ‘evacuations procedures’ in the corridors and lift lobbies
- Display ‘fire emergency procedures’ in the lift lobbies and corridors.
- Display telephone numbers of fire brigade, ambulance, fire officer, fire control room and other concerned persons / agencies in important locations of the building.
- Provide a fire control room preferably at the ground floor entrance of the building.
- Provide alternate power supply for lights, lifts and pumps.
- Provide a fire lift for the building.
- Provide first aid box at important locations of the building
- Provide fire doors in every floors / corridors.
- Install automatic sprinklers in the building
- Install smoke detectors, and fire alarms in the building
- Install close circuit cameras in vital locations.
- Provide fire extinguishers at important places like meter rooms, lift rooms, pump rooms, and corridors.
- Ensure that all extinguishers are serviced and charged regularly.
- Install hose reels and other fittings in the building.
- Ensure that all the hose reels and fittings are regularly serviced and kept for operation in the event of a fire.

- Ensure the storage of enough water for fire fighting
- Ensure that all hydrant systems and pumps are in working condition and give the required water pressure at various points
- Ensure that the occupants have enough training to use the extinguishers, hose reels and other related items.
- Ensure that the occupants have enough knowledge / training in using fire alarms.
- Train the occupants for fire emergency / disaster
- Remove all obstructions from lift lobbies and staircase lobbies.
- Inspect the electric installations regularly.

## **6. FIRE PREVENTION:**

A fire can occur at any time. Therefore various measures are to be adopted in advance to prevent a fire in your building. Some of the measures need to be adopted are given below:

- Prohibit smoking in storage areas of flammable materials.
- If electrical equipment is not working properly or if it gives off an unusual odour disconnect the equipment and call an approved electrician.
- Properly replace any electrical cord that is cracked or has broken connection.
- When using extension cords, protect them from damage. Do not put them across doorways or any place where they will be stepped on or chafed. Check the amperage load specified by the manufacturer.
- Do not plug an extension cord into another, and do not plug more than one extension cord into one outlet.
- Keep all heat producing appliances away from the wall and away from anything that might burn. Leave plenty of space for air to circulate around equipment that normally gives off heat.
- Make sure all appliances in your area such as hot plates, ovens, toasters, mixers, grinders, geezers, clothing irons are turned off when not in use.
- Use ash trays and empty them only when you are sure the ashes, matches and butts are cold.
- Make sure that no one including visitors, has left cigarettes smolderings in waste – baskets or on furniture's, sofas, beds, etc.
- Keep storage areas, stairway landings and other out of way locations free of waste paper, empty cartons, dirty rags and other material that could fuel a fire.
- Report all fire hazards to the officer or any person authorized.
- Create awareness to use fire retardant furniture's, carpets, curtains, etc.
- Follow good housekeeping practices – because a clean house is a safe house.

## 7. FIRE EVACUATION:

Fires are often inspected but that are usually predictable in their behavior. People, however, are unpredictable in their behavior with fire. People often panic when faced with a fire situation. During the fire, you should follow the following procedures to evacuate.

- During fire do not use the elevator.
- Use a building telephone only if you are safe from the fire.
- While exiting, walk and do not run.
- If possible shut all doors behind you and alert those who have difficulty hearing that an emergency evacuation of the building is under-way.
- Proceed along the corridors and through exits in a quiet and orderly manner.
- As the high heeled shoes are hazardous while proceeding down stairs, it is advisable to remove them before entering the stairwell.
- Do not push or jostle.
- Assist persons requiring assistance to reach the nearest safe exit. It may be necessary to hold persons requiring assistance in or near the exit.
- In case you use an escape route, where there is smoke, stay as low as possible. Crawling lets you breathe the cleaner air near the floor as you move toward the exit.
- When you are opening a closed door, feel it with the back of your hand. If it is hot, leave it closed and use your alternative escape route. If it feels normal, brace your body against the door and open it a crack.
- If all exits are blocked by fire or smoke, enter a room preferably with an exterior window, and seal the cracks in the door with available materials to prevent smoke entering the room.
- If possible phone or report your situation and attract the attention of someone outside the building by any possible means
- When you have reached the outside of the building, move away from the exit allowing others behind you to emerge
- Do not attempt to drive your vehicle from the parking area
- Do not enter the building again until permitted by a fire department officer or fire officer.
- Choose a safe meeting place outside the house.
- If a refuge area is provided, move to these areas.

## 8. CONCLUSION :

Fire has enormous potential for destruction. It creates havoc-loss of lives, damage to plant and property, thereby interrupting production – a National loss. During the early stage of fire, your action plays a crucial role in the safety of your family, or colleagues and the amount of damage that occurs. Therefore understanding fire helps us to prevent and control them. Remember that for every minute the fire burns doubles in size. Small fire can grow quickly and become difficult to control. The control of **fire risks** is a complex subject, but it can be simplified if a preplanned system is developed. Water is the most effective **extinguishing agent** for general protection of the premises, but there are certain fire risks such as live electrical equipment and flammable liquids where the use of water may be dangerous. If the remedial measures are not taken in the very early stages of following the outbreak of a fire, the amount of water required increases exponentially. Among the protection system, the automatic **fire sprinklers** are the most effective fire protection system, which extinguishes the fire in the initial stage itself. An automatic sprinkler installation will, in a large majority of circumstances, control and extinguish a fire, with less water and a minimum time, therefore, be the most economic way of limiting the loss in a fire, particularly in areas of limited water supplies.

Automatic **detection systems** are the best since they eliminate human factors, Even when an automatic sprinkler system is installed, it may be desirable to have an automatic detection system as well. Whichever system is in use, however, it is important that an alarm is sounded at a continuously manned station, such as the telephone switch board, so that action can be taken at once to investigate the circumstances and to set in motion the appropriate extinguishing action. To reduce hazardous effects of fire the most basic mechanism to be provided in a building is an alarm system which warns people to leave the building at once, alerts the fire brigade and identifies the location of a fire within a structure or a building. Thus upon discovering a fire, you should send an alarm, let the people, in the building or in your area, know that there is a potential for damage and that they should evacuate immediately. The effectiveness of fire brigade depends on its early arrival at the scene of the fire. An important element in the prevention of outbreak of fires and in their control is the training of employees. Above all, surveillance by all the concerned personnel is of vital significance for fire prevention and fire protection. The easiest way to stop fires is to prevent them from ever taking place. Never violate fire safety laws-they are meant for your protection.