

GENERAL GUIDE-LINES : EMERGENCY EVACUATION

In order to attempt to plan effectively, a person must have a conception of how people will presumably react in an emergency situation, then the factors influencing the evacuation and finally devising and testing the evacuation plan.

HUMAN BEHAVIOUR

How a person reacts in a fire emergency is related to :

- i) Status with the group, past experience and personality;
- ii) The perceived threat of the emergency situation;
- iii) The escape alternatives within the building; and
- iv) The actions of others who are sharing the experience.

The above may cause the behaviour of the individual or the group to degrade or enhance the chances of survival.

The roles established before the fire normally continue to operate during it, e.g. staff members continue to take care of patrons, whilst the patrons look to staff for guidance. Taking this into consideration, fire safety and evacuation plans should examine the roles that people normally play and not seek to prescribe emergency actions that are contrary to these roles, or very complex or ambiguous in interpretation.

Man is a creature of habit and any familiar roles tend to continue in an emergency situation, e.g. choosing a familiar exit in preference to a closer and perhaps safer but less familiar one.

People may not always behave logically in the stress of fire conditions. Panic is contagious and the danger is greater in a large crowd. Fear, rather than actual fire danger, is the main factor in panic. Fatal panics have occurred where there was no fire in a building but people thought there was a fire. On the other hand, where people have had confidence in a building and its exits there have been orderly evacuations without panic even though actual danger was present.

It must be borne in mind that the emergency situation is a complex, rapidly changing situation, particularly a fire and the people will do what appears to them to be the best thing under whatever circumstances they are aware of during the incident.

FACTORS AFFECTING LIFE SAFETY

The concern here is to avoid exposure to life threatening conditions, be it the products of combustion, direct exposure to fire, or any other type of hazard or threat. In a fire situation the factors listed below may vary for each situation and are thus only guide-lines :

- a) The time a fire has had to develop and thus make the environment untenable;
- b) The critical level is where the deterioration of the environment is a danger to life;
- c) Available fuel variations are the actual fire load as well as the effect of any automatic fire extinguishing systems.
- d) The susceptibility of the occupants to fire. This will vary from individual to individual and is largely dependant on age, mobility, awareness, knowledge and the density of the occupants within the building and finally;
- e) The control of the occupants. This, like density, is a characteristic of the occupants as a group more so than as individuals. People exposed to disciplinary control and training will rapidly expand in an orderly way to an emergency. There will be less likelihood of panic and such people will be better able to deal with the unexpected.

THE NATURE OF FIRE IN BUILDINGS

Fire is a chemical reaction and is the least predictable common physical phenomenon. Aspects of fire development, which are important to the severity of the life risk and its control, are ignition potential, fire growth and fire and smoke spread. These factors must be taken into consideration as whether to effect total or partial evacuation in an emergency situation.

EVACUATION – SELECTIVE VS TOTAL EVACUATION

Immediate rapid well-organized evacuation appears to be the exception rather than the rule when people hear an alarm.

In selective evacuations, the total time taken to ascertain fire conditions, to make evacuation decisions, to communicate selective evacuation directions over the communication systems and to actually relocate the people in safer areas can be significantly longer, even several times longer than a relatively simple traditional total evacuation of the same number of people. Even in simple total evacuation drills, evacuation times have been twice as long as predicted.

EVACUATION PLAN

This must be kept as simple as possible but not lose any effectiveness. It must preferably be an extension of the normal activities of the people involved.

Annexure A sets out basic rules and guidelines in creating such a plan.

Once compiled it must be tested. The reasons for this are to ensure it works and familiarize the people with it. A drill should be done at least once a year. Should circumstances change requiring this plan to be modified this should then be re-tested for the above reasons.

EXIT DRILLS

Merely providing well-marked exits does not ensure life safety during a fire, exit drills are needed so that the occupants will know how to plan an efficient and orderly escape and thus avoid confusion.

Personnel should be assigned to check exits to see that they are available, to search for stragglers to count occupants once they are outside the fire area and to control re-entry into the building before it is safe.

Probably the most important decision is determining when and what to evacuate. If in doubt, rather evacuate the entire building.

All employees should recognize the evacuation signal and know the routes they are to follow. If necessary they must shut-off equipment and report to a pre-determined assembly point. Primary and alternate routes should be established and all employees should be trained to use either route.

Roll call must be taken at assembly point and the person in control must be informed of any persons not accounted for. Only trained personnel with the necessary protective gear should attempt any search and rescue.

After each drill a meeting of responsible managers should be held to evaluate its success and to solve any problems that may have arisen.

The timing of drills will depend on the type operation, or use of the premises conducted a few minutes before the lunch break have been found to minimize loss of time and production. The frequency of drills should be determined by the degree of hazard present and by the complexity of shut-down or evacuation procedures.

Evacuation Plans and Procedures

A properly planned and regularly evacuation procedure is necessary for all buildings, so that occupants will know how to make an efficient and orderly escape during an emergency. Any area affected by heat, flame or smoke should be evacuated and where there is any doubt, the entire building should be evacuated. Evacuation can only be successfully undertaken if there are well-constructed marked exits in the buildings.

OBJECTIVES

- 2½ minutes is the average time for everyone to reach a place of safety.
- No one should go towards a fire to escape. An alternative route should always be available.
- Everyone should be able to escape by their own unaided efforts. Special attention will have to be given to aged, ill and non-ambulant occupants.
- Escape routes should lead directly to a place of safety.
- A place of safety is an area where people can disperse – it may be outside, in another compartment, a protected staircase or lobby.

CONSIDERATIONS

In planning evacuation procedures, the following must be considered.

- The possible behaviour of a fire with special regard to the spread of smoke.
- The type of risk and number of occupants. People may either be sleeping, be unfamiliar with the building or be very young or aged. The building contents could facilitate rapid fire spread.
- The number of escape routes is determined by dividing the floor area by the recommended floor area required per person. The design density population for an office is, for example, 1 person per 10m².
- The exit widths must accommodate the occupants to enable them to evacuate within 2½ minutes.

ADDITIONAL CONSIDERATIONS

- An alarm system is essential to initiate evacuation procedures.
- A designated person prior to evacuation should shut down moving machinery, fuel and gas lines and certain electrical equipment.
- Partial or phased evacuation may be initiated in large buildings where total evacuation is unpractical. Partial evacuation being the relocation of people to a safe area and phased evacuation, the progressive relocation of people to safe areas – suitable for hospitals.

PROCEDURE

The evacuation plan should be circulated to occupants and management, brief details being displayed on each floor or within each section. It will be necessary to appoint a Chief Fire Marshal (CFM) to direct operations (usually from a control center). Fire Marshals on each floor can supervise evacuation, initially attack the fire and assist the Chief Fire Marshal.

The following procedure is a general guide, which can be modified to suit the particular building and occupancy.

MARSHALS AND THEIR RESPONSIBILITIES

Chief Fire Marshal and Deputy Officer
White hardhat

Responsible for:

- Staff training;
- Fire prevention;
- Notifying and meeting the Brigade;
- Deciding to evacuate;
- Organizing personnel for evacuation duties.

Floor or Section Fire Marshals
Red hardhat

Responsible for:

- Notifying the Chief Fire Marshal of the location and extent of the fire;
- Fighting the fire;
- Safe evacuation of all personnel from their own floor or section.

Deputy Floor or Section Fire Marshals
Yellow hardhat

Responsible for:

- Assisting the floor or section wardens in carrying out their tasks.

If a multi-storey building is to be completely evacuated, the following events should be followed as closely as possible.

When a fire breaks out, people in the emergency center – in this case the reception area on the ground floor – are notified. They will then:

- Inform the Fire Brigade
- Contact the Chief Fire Marshal
- Initiate the evacuation alarm
- Recall lifts to ground floor

The Chief Fire Marshal will:

- Take charge of the emergency center
- Co-ordinate the evacuation and activities of fire teams and control building services such as lifts, booster pumps, air conditioning, power supplies and fire suppression installations
- Liaise with the fire department

On the fire floor, Fire Marshals will:

- Begin evacuating employees
- Attack the fire if expedient to do so

The duties of the Fire Marshals during an emergency are:

- Muster occupants and guide them to correct exits
- Prevent people from returning for personal possessions
- Prevent people using lifts
- Control congestion in stairways

- Assist the old, infirm, or injured
- Search floor area, toilets on landings between floors
- Close doors, particularly staircase doors
- Report to the Chief Fire Marshal that floor is clear
- Guide occupants to assembly area
- Take roll call (this procedure is not always appropriate)

Once the emergency is over, staff will be dismissed to return to their workstations or to go home depending on circumstances. This will only happen when the 'all clear' has been given by the fire department, Chief Fire Marshal or management, whichever is applicable.

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