

GUIDELINES FOR FIRE & EMERGENCY DRILL AND EVACUATION PROCEDURES FOR COMMERCIAL BUILDINGS (MALLS, HOTELS, DEPARTMENTAL STORES)

I. INTRODUCTION

In case of fire in commercial building (Malls, Hotels, Departmental Stores), safe evacuation of its occupants may present serious problems unless a plan for orderly and systematic evacuation is prepared in advance and all occupants are well drilled in the operation of such plan. These guidelines are intended to assist them in this task.

1.1 From the history of Fire Emergencies and Causalities thereby, it is established that the lack of knowledge of “what to do” when fire breaks out has been the cause of more loss of life and property than the actual damage caused by the fire itself. In view of these past experiences and facts this note is prepared for general understanding of the purpose of Fire Exit Drill and principles to be followed while formulating Fire Exit Drill procedure for different types of establishments and occupancies.

1.2 Smoke: - Smoke is nothing but “airborne solid and liquid particulate” in gases released during a fire. Smoke is the greatest single factor in increasing losses which occur in fire. By completely obscuring visibility within the area where fire occurs, it creates panic amongst the occupants, leading to stampede, resulting injuries or death. Moreover, itself it is, highly injurious to human being. For its above mentioned properties a great hurdle is created for the evacuation process, as well as due to the smoke fire fighters job is also made more difficult.

1.3 Heat: - This is a combustion product in the form of energy, which is mostly responsible for the spread of fire in the building by way of its transmission process. It also seriously injures or kills the occupants or the fire fighting personnel. Heat therefore is a great handicap to fire fighters and also has adverse effect on the evacuation process.

1.4 Flame: - The burning of material in the presence of normal oxygen concentration is accompanied by heat of fire reaction. The flames can be Non luminosity cold flame. It is non luminous or luminous. Non luminous flame arises where the air supply is plenty, whereas luminous flames arise when the air supply is limited. Flames have complex structure of several zones, some of which may be luminous and other non luminous. Luminosity is due to presence of solid matters in the cases cited above this consists of minute carbon particles. The luminosity is increased by raising the temperature of the flame. Flames consist of large masses of reacting gases which are extremely hot. Most of the heat is carried away by the hot products of combustion moving away from the flame itself. But some heat is lost by radiation from the flame. In luminous flame the presence of the carbon particles increases the radiation from the flames very considerably.

When flames are produced they: -

- i) Spread fire and heat through the contact of the flames with surrounding matter.
- ii) Spread fire and heat through radiation from the flames.
- iii) Handicap evacuation process and fire fighting operation through intense radiation of heat.

2. TABLE TOP EXERCISE:

- i) Table top exercise should be conducted before conducting actual mock drill to facilitate group analysis of an emergency situation in an informal, stress free environment.
- ii) The Table top Exercise is designed for examination of operational plans, problem identification, and in-depth problem solving.
- iii) The tabletop exercise is essentially a group brainstorming session centered on a scenario narrative and problem statements or messages that are presented to members of the group.

3. ALARMS

Any person discovering fire, heat or smoke shall immediately report such condition to the fire brigade, unless he has personal knowledge that such a report has been made. No person shall make, issue, post or maintain any regulation or order, written or verbal, that would require any person to take any unnecessary delaying action prior to reporting such condition to the fire brigade.

4. DRILLS

4.1 Fire & emergency drills shall be conducted, in accordance with the Fire Safety Plan, at least once every three months for existing buildings during the first two years. Thereafter, fire & emergency drills shall be conducted at least once every six months.

4.2 All occupants of the building shall participate in the fire & emergency drill. However, occupants of the building, other than building service employees, are not required to leave the floor or use the exits during the drill.

4.3 A written record of such drills shall be kept on the premises for a three years period and shall be readily available for fire brigade inspection.

5) FIRE ROUTINE DETAILS :

A fire routine as a general rule should be based on a sequence of events. Details will be as listed below :

- a) **Alarm Operation** : Type – single or Two stage – Audible or otherwise – total or partial – Notification to central point.
- b) **Power** : Stopping central A. C., isolating power supplies.
- c) **Call the fire brigade** : Precise instructions – watchman's or receptionists instructions.
- d) **Evacuation** : (i) Two stage instructions – closing of Doors and windows, search of toilets etc. (ii) Responsible persons for carrying out the patients by various rescue methods.
- e) **Assembly** – Away from premises – under cover – mutual arrangement with nearby premises.
- f) **Roll Call** - Registers – Responsible person – Reports to Fire Brigade Officer about any missing employees/inmates.

- g) **Attacking the Fire** - Circumstances will dictate whether fire fighting operations should be attempted.
- h) **Testing of installations and equipment :**
 - i) During the Drill, the real performance of all the available fire fighting installations and equipment, viz. Hose Reel, Wet Riser, Downcomer, Yard Hydrant system, Fire Extinguishers, Emergency Lighting, Automatic Detection and alarm system, Sprinkler system, Smoke management system, Fire Doors, Water tanks, Fire Pumps, etc. have to be tested and deficiencies if any shall be recorded in the Fire and Emergency Drill Check List.
 - ii) It is the responsibility of the building Management to rectify the deficiencies immediately to ensure fire and life safety.

6. DEMONSTRATIONS

It may be ensured to conduct demonstrations at periodic intervals so that all the inmates are familiarized with the usage / working of Fire Extinguishers, Hose Reel, Wet riser , Fire alarm System (manual and automatic) and Sprinkler System.

7. SIGNS AND PLANS

7.1 Signs at Lift Landings

- i) A sign shall be posted and maintained in a conspicuous place on every floor at or near the lift landing in accordance with the requirements, indicating that in case of fire, occupants shall use the stairs unless instructed otherwise. The sign shall contain a diagram showing the location of the stairways except that such diagram may be omitted, provided signs containing such diagram are posted in conspicuous places on the respective floor.
- ii) A sign shall read "IN CASE OF FIRE, USE STAIRS UNLESS INSTRUCTED OTHERWISE". The lettering shall be at least 12.5 mm block letters in red and white background. Such lettering shall be properly spaced to provide good legibility. The sign shall be at least 250 mm x 300 mm, where the diagram is also incorporated in it and 62.5 mm x 250 mm where the diagram is omitted. In the latter case, the diagram sign shall be at least 200 mm x 300 mm. The sign shall be located directly above a call-button and squarely attached to the wall or partition. The top of the sign shall not be above 2 m from the floor level.

7.2 FLOOR NUMBERING SIGNS

- i) A sign shall be posted and maintained within each stair enclosure on every floor, indicating the number of the floor, in accordance with the requirements given below.
- ii) The numerals shall be of bold type and at least 75 mm high. The numerals and background shall be in contrasting colors. The sign shall be securely attached to the stair side of the door.

7.3 STAIR AND ELEVATOR IDENTIFICATION SIGNS

- i) Each stairway and each elevator shall be identified by an alphabetical letter. A sign indicating the letter of identification shall be posted and maintained at each elevator landing and on the side of the stairway door from which egress is to be made, in accordance with the requirements given below:
- ii) The lettering on the sign shall be at least 75 mm high, of bold type and of contrasting color from the background. Such signs shall be securely attached.

7.4 STAIR RE-ENTRY SIGNS

- i) A sign shall be posted and maintained on each floor within each stairway and on the occupancy side of the stairway where required, indicating whether re-entry is provided into the building and the floor where such re-entry is provided, in accordance with the requirements given below:
- ii) The lettering and numerals of the signs shall be at least 12.5 mm high of bold type. The lettering and background shall be of contrasting colors and the signs shall be securely attached approximately 1.5 m above the floor level.

7.5 Fire command station shall be provided with floor plan of the building and other pertinent information relative to the service equipment of the building.

8. PREPARATION OF FIRE SAFETY PLAN

8.1 It is essential to prepare fire safety plan according to Clause C-8 (Annex - E) of part-4 of National Building Code of India,2005 duly incorporating the following important components.

- i) Fire Safety Director.
- ii) Deputy Fire Safety Director.
- iii) Fire Wardens and Deputy Fire Wardens.
- iv) Building Evacuation Supervisor.
- v) Fire Party.
- vi) Occupants Instructions.
- vii) Fire Command Station
- viii) Signs

The Fire safety plan format and duties of above responsible inmates or enclosed at **Annexure – I.**

8.2 The applicable parts of the approved Fire Safety Plan shall be distributed to all occupants of the building by the building management when the Fire Safety Plan has been approved by the Fire Authority.

8.3 The applicable parts of the approved Fire Safety Plan shall then be distributed by the occupiers to all their employees and by the building management to all their building employees.

8.4 Where the owner of the building is also an occupant of the building, he shall be responsible for the observance of these rules and the Fire Safety Plan in the same manner as an occupant.

8.5 In the event there are changes from conditions existing at the time the Fire Safety Plan for the building was approved, and the changes are such so as to require amending the Fire Safety Plan, within 30 days after such changes, an amended Fire Safety Plan shall be submitted to the fire brigade for approval.

9. FIRE COMMAND STATION

A Fire Command Station shall be established in the lobby of the building on the entrance floor. Such command station shall be adequately illuminated.

10. COMMUNICATIONS AND FIRE ALARM

A means of communication and fire alarm for use during fire emergencies shall be provided and maintained by the owner or person in charge of the building. It is advisable to procure battery operated portable loud speakers to assist in crowd control during evacuation.

11. OCCUPANT'S INSTRUCTIONS

- i) The applicable parts of the approved Fire Safety Plan shall be distributed to all tenants of the building by the building management when the Fire Safety Plan has been approved by the Fire Department.
- ii) The applicable parts of the approved Fire Safety Plan shall then be distributed by the tenants to all their employees and by the building management to all their building employees.
- iii) All occupants of the building shall participate and cooperate in carrying out the provisions of the Fire Safety Plan.

12. FIRE PREVENTION AND FIRE PROTECTION PROGRAMME

- i) A plan for periodic formal inspections of each floor area, including exit facilities, fire extinguishers and house keeping shall be developed. A copy of such plan be submitted.
- ii) Provision shall be made for the monthly testing of communication and alarm systems.

13. BUILDING INFORMATION FORM

It shall include the following information:

- a) Building address Pin Code
- b) Owner or person in-charge of building — Name, Address and Telephone Number.
- c) Fire Safety Director and Deputy Fire Safety Director's Name and Telephone Number.
- d) Certificate of occupancy. Location where posted, or duplicate attached.
- e) Height, area, class of construction.
- f) Number, type and location of fire stairs and/ or fire towers.

- g) Number, type and location of horizontal exits or other areas of refuge.
- h) Number, type, location and operation of elevators and escalators.
- i) Interior fire alarms, or alarms to central stations.
- j) Communication system and/or walkie talkie, telephones, etc.
- k) Standpipe system; size and location of risers, gravity or pressure tank, fire pump, location of Siamese connections, name of employee with certificate of qualification and number of certificate,
- l) Sprinkler system; name of employee with Certificate of Fitness and certificate number.
- m) Primary and secondary water supply, fire pump and areas protected,
- n) Special extinguishing system, if any, components and operation,
- o) Average number of persons normally occupiers in building. Daytime and night time,
- p) Average number of handicapped people in building. Location. Daytime and night time,
- q) Number of persons normally visiting the building. Daytime and night time,
- r) Service equipment such as:
 - i) Electric power, primary, auxiliary;
 - ii) Lighting, normal, emergency, type and location;
 - iii) Heating, type, fuel, location of heating unit;
 - iv) Ventilation — with fixed windows, emergency means of exhausting heat and smoke;
 - v) Air-Conditioning Systems — Brief description of the system, including ducts and floors serviced;
 - vi) Refuse storage and disposal;
 - vii) Fire fighting equipment and appliances, other than standpipe and sprinkler system; and
 - viii) Other pertinent building equipment.
- s) Alterations and repair operations, if any, and the protective and preventive measures necessary to safeguard such operations with attention to torch operations,
- t) Storage and use of flammable solids, liquids and/or gases,
- u) Special occupancies in the building and the proper protection and maintenance thereof. Places of public assembly, studios, and theatrical occupancies.

14. REPRESENTATIVE FLOOR PLAN

A floor plan, representative of the majority or the floor designs of the entire building, shall be at the Command Post, in the main lobby, under the authority of the Fire Safety Director. One copy of a representative floor plan shall be submitted to the Fire Department with the Fire Safety plan.

15. PERSONAL FIRE INSTRUCTION CARD

All the occupants of the building shall be given a Personal Fire Instruction Card giving the details of the floor plan and exit routes along with the instruction to be followed in the event of fire. A typical Personal Fire Instruction Card shall be as follows:

PERSONAL FIRE INSTRUCTION CARD SEAL
NAME OF THE ORGANIZATION ADDRESS OF THE ORGANIZATION

NAME:
DESIGNATION:.....
FLOOR NO.:.....
DATE:.....

FIRE WARDEN

16. FIRE & EMERGENCY INSTRUCTIONS NOTICES

(a) At conspicuous positions in all parts of the building printed notices should be exhibited stating, in concise terms, the essentials of the action to be taken upon discovering a fire and on hearing the fire alarm. The fire instruction notices should be brief, clear, prominent, legible, appealing.

(b) A model of a fire instruction Notice is as follows

I. FOR YOUR OWN SAFETY YOU SHOULD KNOW

- i) Two push button fire alarm boxes are provided per floor. You should read the operating instructions.
- ii) You should read the operating instructions on the body of the fire extinguishers provided on your floor.
- iii) The nearest exit from your table.
- iv) Your assembly point at _____ (check with your Fire/Deputy Fire Warden).

II. FOR YOUR OWN PROTECTION YOU SHOULD REPORT TO YOUR FIRE/ DEPUTY FIRE WARDEN

- i) If any exit door/route is obstructed by loose materials, goods, boxes, etc.
- ii) If any staircase door, lift lobby door does not close automatically, or does not close completely.
- iii) If any push button fire alarm point, or fire extinguisher is obstructed, damaged or apparently out of order.

III. IF YOU DISCOVER A FIRE

- i) Break the glass of the nearest push button fire alarm and push the button.
- ii) Attack the fire with extinguishers provided on your floor. Take guidance from your Wardens.
- iii) Evacuate if your Warden asks you to do so.

IV. IF YOU HEAR EVACUATION INSTRUCTIONS

- i) Leave the floor immediately by the south/ north staircase.
- ii) Report to your Warden, at your predetermined assembly point outside the building.
- iii) Do not try to use lifts.
- iv) Do not go to cloakroom.
- v) Do not run or shout.
- vi) Do not stop to collect personal belongings.
- vii) Keep the lift lobby and staircase doors shut.
- viii) Your assembly point at _____ (check with your Fire/Deputy Fire Warden).

17. EVALUATING FIRE & EMERGENCY DRILL PLANS

(a) The ultimate evaluation of fire & emergency drill and emergency plans has two factors.

- i) Performance of the staff in a fire incident in the Building.
- ii) Effectiveness of the behavior in accordance with the fire & emergency drills or the fire emergency plan.

(b) The successful evacuation of the inmates to reach a place of safety within the floor viz., protected staircase, protected lift lobby, Refuge area or Assembly point outside the building within reasonable time (2 ½ minutes) before the spread of smoke, fire and heat is the essence of evaluating the fire & emergency drill.

(c) Fire safety education and practice of evacuation procedures by the employees/inmates will determine the success of a fire & emergency drill in the Building.