European guideline (handbook)

Fire evacuation drill

(draft document)

Ver: 2010-06-02
Prepared by Aleš Jug, Slovenia

Related guideline: CFPA E: 19_2009
Fire safety engineering concerning evacuation from buildings

Foreword

To be prepared later

Content

1. Introduction

Evacuation can be discussed in a several ways. One important issue about the evacuation process is design of escape routes that usually consists of active and passive protection systems like fire detection and suppression, fire separation etc. Other important factors are evacuation procedures and fire safety organization. Usually these factors are not prescribed in codes and they mainly depend on fire safety organization at particularly company or building.

Evacuation procedures in general depends on:
- type of building,
- structure and number of building occupants and
- internal company organization.

While type of building creates basic rules and condition for evacuation, structure and number of occupants and internal organization are very much dependable on human factors, their behavior, experiences and reaction to fire scenarios.

2. Scope

The main scope of this guideline is to give the building owners, fire brigades and building occupants basic rules and orientation to:
- organize evacuation,
- educate and train employees,
- perform safe and quick evacuation when necessary.

Practicing an evacuation during non-emergency annual drills provides good training for building users. It is a valuable and "life dependant" procedure in an emergency situation. Evacuation drills are required by many local regulations.

In general all building users must participate in emergency evacuation drills.

3. Key terms

As written in Guideline No 19:2009

4. Evacuation procedures

There are not many existing written materials about evacuation procedures, though in the field of fire safety evacuation procedure is discussed many times. Usually written materials raised two important factors that affect the evacuation. The first is *psychological factor*, which refers to behavior of people in fire. The second factor represents the *technical elements* or building systems like passive and active fire protection.

Terminologically evacuation means the relocation of people or anything else from the area, which is threatened by natural disasters, war, etc. to safe location named fire or assembly point.

Evacuation procedures may have several priorities:

First Priority: **Protection of Life** – In general we can say that first priority is to ensure that all people who may be in danger are warned. Besides that further actions can be taken to guarantee their safety.

Second Priority: **Prevent Spread of Hazard** - The second priority is controlling the extent of the hazard, for ex. fire can be suppressed and prevented of spread.

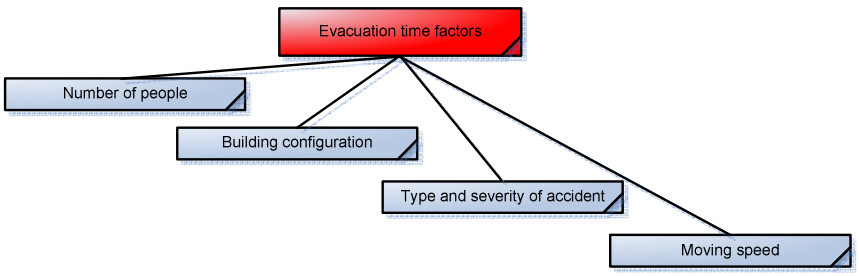
Third Priority: **Save Assets in the Affected Area** - The third priority is to prevent personal and company assets from being damaged in the event of a fire.

Fourth Priority: **Eliminate the Hazard** - The final priority is to eliminate the fire by extinguishment.

Different type of emergencies may require a building, workplace etc. to be evacuated. These emergencies include man-made or natural events, such as fires and explosions, earthquakes, floods, violence, different disturbances, threats etc.

It is important to estimate of the time needed for evacuation. The time will depend on a variety of factors:

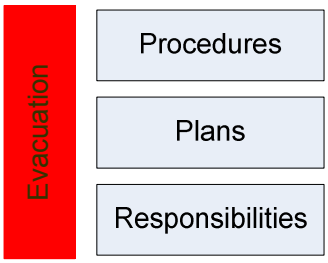
- Number of people to be evacuated;
- Building configuration and accommodation type;
- Impact of incident on building, including evacuation routes; and
- Number of people needing assistance.



The amount of time needed for evacuation may affect other portions of the evacuation phase. For example, if the amount of time needed for evacuation exceeds the time available prior to the situation reaching a critical phase, options could include improving detection or notification, or ordering evacuation earlier in the incident.

5. Evacuation organization and responsibilities

Evacuation organization consists of procedures, plans and responsibilities of employees, occupants or visitors that plays role in evacuation procedure.



Successful and efficient evacuation depends on complete preplanning, organization, and supervision. Evacuation planning should include following basic principles:

1. Building evacuation organization;
2. Evacuation policy and plans;
3. Responsibility for Developing and Implementing Emergency Procedures;
4. Detection and reporting (of fire or hazard);
4. Evacuation program coordination (of movement and evacuation);
5. Implementation of Emergency Procedures;
6. Training;
7. Evacuation Drills;
8. Emergency Evacuation Procedures in the Case of Fire;
9. Communication to direct movement and evacuation;
10. Inspection and evaluation.

Evacuation organization begins with written plan.

It is important that each workplace will have a fully implemented emergency evacuation procedure. The procedure must be design to assist the organization and implementation of emergency evacuation procedures for workplaces.

Among evaluation personnel fire warden usually organize and supervise the evacuation procedures. Fire warden tasks during the fire are:

- Ascertain the size of the emergency;
- Assist people to evacuate from building;
- Raise alarm (break manual alarm station or shout FIRE, FIRE, FIRE);
- Try to extinguish fire if fire is small enough and it is safe to do so;
- Implement evacuation of workplace;
- Perform methodical search of their area to ensure that all persons have been notified of emergency and have, or are leaving, the workplace to the cluster point;
- Assist mobility impaired persons;

- Prevent persons from entering the building while the evacuation alarms are sounding by placing a staff member at their exit;
- Organize activities at fire point.

Fire warden tasks before a fire occurs:

- To familiarize new employees with fire evacuation procedures.
- To assist persons with disabilities with evacuation pre-planning, drills and actual evacuations.
- To note any malfunctioning alarms.
- To note any impaired fire escape routes and fire doors.
- To discourage tampering with fire alarm and protection equipment.

Notice: Provision about fire warden requirements and organization must apply with local regulations.

Written plan - As soon as building occupancy begins, a written plan of fire and other emergency procedures should be agreed upon by building management and responsible representatives of each building tenant.

Notice: Provision of written plan must apply with local regulations.

The emergency evacuation plan should include:

1. *ORGANIZATION:* An outline of the emergency evacuation organization plan and agreed-upon priorities, including responsibilities and authorities. Building owner, users and visitors should agree upon these and must be familiar with these. The emergency control organization facilitates the safe and orderly implementation of the emergency procedures in a building, including the evacuation of the occupants from the building when appropriate. Evacuation personnel are a structured organization of people employed within a building who take command on the declaration of an emergency, pending the arrival of the fire brigade or other emergency service. Evacuation personnel usually comprises: -

- Fire Safety Responsible
- Fire Warden
- First Aid Personnel
- Other Specialists (depending on building type etc.)

Notice: Provision of evacuation personel must apply with local regulations.

2. *DETECTION:* Detection, emergency warning systems, and reporting procedures for fire and other hazards should be provided.

3. *COORDINATION:* Coordination of building emergency evacuation control with assigned floor emergency evacuation teams should provide for the orderly movement of persons.

Pre-planning and "fire in progress" chain-of-command instructions should be detailed. Every person has to know its responsibilities and tasks in case of evacuation.

4. COOPERATION: Building management, building users and fire brigade (optional) should cooperate in an education and training program for all emergency floor-evacuation teams, employees, and building visitors.

Emergency fire procedure information should be prominently posted in corridors.

Notice: Provision of emergency fire procedure information must apply with local reguations.

5. RESPONSIBILITIES: One individual should be designated to establish a program, including proper documentation for regular inspections and follow-up to maintain the detection and communication system in the best operating condition.

Notice: Provisions of responsible person must apply with local regulations.

6. EVACUATION DRILS: An evacuation drill program should be established that will include periodic practice of movement of occupants to refuge areas. The frequency of these drills – monthly, quarterly, etc. – would depend upon the type of building occupancy and building users.

The schedule should be maintained and documented. The drill should include the progressive movement of personnel to areas of safety.

Notice: Provisions about fire drills must apply with local regulations.

When preparing for evacuation it is good to establish the planning team. Planning team shall consist of:

- building owner,
- responsible person,
- employees involved in special evacuation tasks,
- fire brigade

6. Employee tasks

Employee tasks must be written in evacuation plan. Each employee must be familiar with all tasks and procedures. In case of emergency, certain equipment and processes must be shut down in stages or over time. In other instances it is not possible or practical for equipment or certain process to be shut down under certain emergency situations. This condition, which is not unusual for certain large manufacturers operating complex processes, is not typical of small enterprises that normally can turn off equipment or utilities if necessary and evacuate. However some small enterprises may require designated employees remain behind briefly to operate fire extinguishers or shut down gas and/or electrical systems and other special equipment that could be damaged if left operating or create additional hazards to emergency responders (such as releasing hazardous materials).

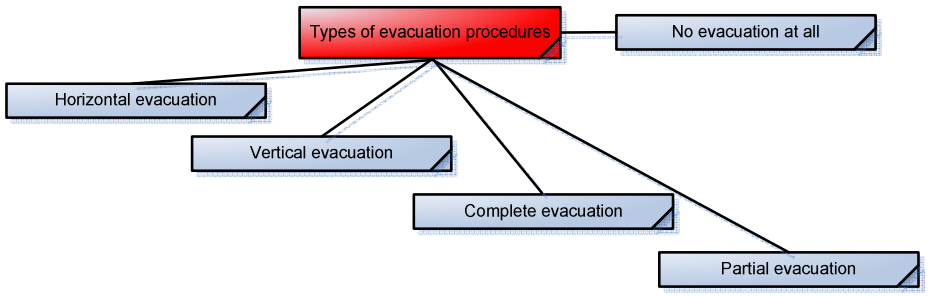
Notice: Provisions of employee tasks must apply with local regulations.

If any employees will stay behind, the plan must describe in detail the procedures to be followed by these employees. All employees remaining behind must be capable of recognizing when to abandon the operation or task and evacuate themselves before their egress path is blocked. In small establishments it is common to include in your plan locations where utilities (such as electrical and gas) can be shut down for all or part of the facility either by your own employees or by emergency response personnel.

7. Types of evacuation

Depending on the event, building structure and number of occupants, four types of evacuation can be performed:

- vertical evacuation,
- horizontal evacuation,
- partial evacuation and
- total evacuation.



Vertical evacuation is a way of bringing people to safety by having them "go down" in buildings. The end point of vertical evacuation is a fire point where evacuees will wait for further instructions.

Horizontal evacuation generally means to move on the same floor to another section in the same building or an adjacent building instead of exiting vertically via the stairs

or elevator. The advantage to horizontal evacuation is that one may remain inside, protected from the weather and avoid descending over stairs. Hence, this method is of primary importance for people with disabilities.

A partial evacuation may involve either the relocation of occupants to unaffected areas or removal from the building of only those occupants in affected areas.

A complete evacuation involves the removal of all occupants from the building, with the possible exception of emergency team members.

There may also be some situations where occupants should not evacuate the building. Such instances should also be identified at this time. In these instances, rather than identifying the means of evacuation notification, the issue will be ensuring notification of the order to remain in place.

Each employer must review their operation and determine what type of evacuation is suitable for its building type and building users.

Different types of evacuation and its combination are possible for various types of emergencies. The preferred approach, and the one most often taken by small enterprises, is complete evacuation of all their employees when the evacuation alarm is sounded.

The initial tasks for the planning team include determining whether evacuation might be required for each type of emergency, whether evacuation would need to be partial or complete and how urgent the need to evacuate might be. These factors will need to be considered together to determine the evacuation scenarios that may arise for each emergency.

8. Evacuation drill

Evacuation drill is a permanent training procedure for evacuation operations and tasks related to evacuation operations.

When preparing an evacuation drills, planning team must be included.

Notice: Provisions about evacuation drills must apply with local regulations.

When preparing an evacuation drill, step 1 to 7 can be used:

Step 1 - *Write out the details of the evacuation drill and give a copy to each employee. The plan should include:*

- the type of alarm that building users can expect,
- meaning of particular alarms,
- available exit identification and definition of exits of each part of the building.
-

Exits should be determined by proximity and accessibility. Accommodations should be made for disabled persons.

Step 2 - *Communicate details of the plan for evacuation to the staff.*

Each member should know either the evacuation drill will be unannounced or the exact time of your drill.

It is recommended that first fire drill schedule is predefined. For subsequent tests, only the day should be divulged to test preparedness.

Step 3 - *Incorporate specific details into your drill. Fire drills should have all realistic procedures for:*

- fire brigade notification,
- building alarm,
- closing doors to contain smoke,
- organize an evacuation,
- evacuation of disabled persons,
- fire point operations,
- special activities after the evacuation (accommodation planning, operation processes etc.)

Step 4 – Check all evacuees at fire point. Know the number of people you are evacuating. It is important to account for each person during an evacuation (including visitors) and that everyone is removed from the location safely.

Step 5 - *Define specific evacuation roles for staff.* Assign a person to monitor each section of the building and others to conduct a head count once outside. When preparing an evacuation evaluation, fire brigade staff can be included.

Step 6 - *Prepare to accommodate special needs persons and personnel* by dedicating at least twice the amount of special needs staff to help evacuate this group. Use additional personnel where needed.

Step 7 - Coordinate with emergency center to organize transpiration services and alternate accommodation in case of a real emergency.

9. Training for evacuation drills

Training for evacuation is a permanent process.

Notice: Provisions about training for evacuation drills must apply with local regulations.

Usually planning team will organize evacuation drills. It is recommended that evacuation drills are supervised and analyzed. Following forms can be used to analyze the evacuation processes:

Form 1: Evacuation staff response

Evacuation Staff Response	Yes	No	NA
Building evacuation staff reported to proper locations on floor.			
Aides for disabled occupants were available and assisted occupants to a safe location to await evacuation.			
All areas of floor were searched.			
Floor Monitors waited for all occupants in area to evacuate before evacuating themselves.			
Roll Takers took roll at the emergency assembly point and accounted for personnel.			

Comments on evacuation staff response: _____

_____

_____

Form 2: Occupant response

Occupant Response	Yes	No	NA
Reacted to alarm immediately.			
Hood sashes were closed.			
Hazardous equipment turned off.			
Knew or were directed to the location of alternate means of egress from the area.			
Attempted to use elevators for evacuation.			
Evacuated in an orderly manner.			
Responded to directions from evacuation staff.			
Visitors in area were directed to evacuate.			
Interior doors were closed on evacuating.			
Occupants were prevented from re-entering the building once they were outside.			
Staff reported to assigned assembly point and checked in.			

Comments on Occupant Response: _____

_____

_____

Form 3: Emergency protection

Emergency Protection	Yes	No	NA
Alarm was audible on floor.			
Visual alarm indicators (if applicable) operated.			
Voice notification (if applicable) was audible and understandable.			
Doors, corridors, and stairways were unobstructed.			
Automatic door closers (if applicable) operated.			
Automatic equipment shutdown was activated as required.			

Comments on Emergency Protection: _____

_____

_____

Evaluator Comments: _____

_____

_____

_____

_____

Signature: _____