FIRE SAFETY PROCEDURES IN THE INTERNATIONAL STUDENT DORMITORIES

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I. General Principles

According to the Art. 4 of the August 24, 1991, ruling on fire prevention, a building owner is required to satisfy all fire prevention regulations, especially the following ones:

- Abide by the fire prevention codes for building, electrical, and mechanical installations.
- Equip the building premises and the surrounding area with portable fire extinguishing and fire rescue equipment according to the current regulations.
- Provide safety and emergency evacuation routes for the people present in the building and in the surrounding area.
- Prepare the building and its surroundings for carrying out rescue operations.
- Create and implement an emergency response and evacuation plan for dealing with the eventualities of fire, natural disaster or any other local emergency.

II. Potential sources of fire and the routes of fire spread

The causes of a potential fire incident may originate from:

1. Defective or dangerous condition of the electrical installations or equipment:

– defective or faulty construction work
– lack of periodic maintenance
– use of makeshift installations and equipment
– power overload of the electrical system by plugging in an excessive number of electrical devices into one circuit
– use of the improper power supply units
– not following the requirements for keeping a safe distance between the heating devices or incandescent lighting units and the flammable materials.

2. The use of open fire:

– smoking tobacco near flammable materials
– leaving a smoldering item unattended, i.e., a cigarette or a match
– using open-fire sources or heating appliances which may ignite when kept in the proximity of flammable materials
– performing the remodeling or construction work such as welding, cutting, heating substances or materials, painting or gluing with the use of materials that are not nonflammable.

3. Improper storage or handling of highly flammable substances.

4. Improper storage of exothermically reactive substances.

5. Storage of solid substances in the proximity of materials to which they will react with their self-heating properties.

6. Arson.

Besides the above-listed causes, other types of potential fire danger may occur in difficult-to- predict situations, especially inside rooms used for work or storage purposes.

The spread of fire in a building structure depends on the use of the construction and technical safeguards that may increase or decrease the risk of the spread of fire, smoke, fumes, and combustion gases between particular rooms, floors, and buildings. The speed of the spread of fire is determined by:

- flammable structural elements or construction materials
- the high flammability of interior finishing materials and furnishings
- the utility installation systems — ventilation, electrical, heating, and gas
- open transportation corridors — hallways and stairwells
- leaky flue and chimney ducts.

III. Fire prevention

Within structures and their surrounding areas it is prohibited to perform the following activities which may cause a fire, contribute to a spread of the fire, and make it difficult to perform rescue operations or an evacuation:

1. Using open fire, smoking tobacco, or using items that may ignite the materials present:

    a. within the fire danger area
    b. within areas containing materials that pose a fire hazard

2. Using installations, fixtures, equipment, and tools that are defective or not appropriate — according to the standards specified by the manufacturer instructions — for the particular activities actually performed.

3. Using electrical heating appliances by placing them directly on a flammable surface, with the exception for appliances where manufacturer's specifications authorize it.

4. Storing flammable materials; using items made of flammable materials for interior decorations, finishes, fixtures, and furnishings; and placing them within a distance smaller than 0.5 meter from:
    a. devices and installation systems whose exterior surfaces may reach and exceed the temperature level of 373.15 K (100℃);
    b. cabling with voltage exceeding 1 kV, grounding cables and lightning rod installations, live electric power distribution control panels, as well as plug-in power sockets with voltage exceeding 400 V.

5. Using flammable materials as shielding around lighting fixtures, except for materials that are not highly flammable or that are nonflammable when they are placed at least 0.05 m away from the light bulb.

6. Installing the lighting framework and fixtures, or the electrical fixtures such as switches or power sockets directly on a flammable surface — even though their construction does not safeguard against fire ignition.

7. Storing flammable materials in the emergency exit routes designated for evacuation purposes or placing objects that obstruct these routes, and thus reducing the evacuation route width or height below the required levels specified by building safety regulations.

8. Closing the evacuation doors in a way that makes their immediate use impossible in case of fire or another type of emergency prompting the necessity of evacuation.

9. Blocking the fire doors and gates in a way that disables their automatic self-closing mechanisms in response to a breaking out fire.

10. Making it impossible for or limiting access to:

    a. fire extinguishers and fire-extinguishing equipment
    b. blow-out panels reducing explosion impact
    c. sources of water for the fire-extinguishing purposes
    d. systems activating and controlling the operation of fire-extinguishing installations as well as other systems affecting the fire safety of a structure
    e. evacuation exits or rescue windows for rescue services' access
    f. electrical power switches and control panels, and gas main shut-off valves
    g. external grating, bars or shutters that according to building safety regulations should open from the inside of apartments or rooms.

IV. Instructions for using the basic portable fire-extinguishing equipment

Fire — it is an uncontrollable process of oxidization occurring in an unintended place. The quadrant of combustion is the condition for a fire's ignition and its course; the same applies to the oxidization process:

- flammable material
- oxidizer

- heat
- complicated chain reactions (free radicals)

Oxidization is a chemical process in which oxygen from the air combines with the flammable material, accompanied by the emission of heat, light, fumes, and gases as its products. An energy stimulus, heat, acts as the condition for starting the oxidization. The oxidization process once started continues to develop spontaneously and uncontrollably. It may be disrupted by:

- removal of the flammable material or by making it nonflammable in those particular conditions
- elimination of the heat source that feeds the burning process, i.e., cooling it down
- cutting off oxygen access to the fire area

The above-listed activities are the basis for extinguishing fires, and the portable extinguishing equipment plays a fundamental role in the situations where there is a possibility of putting out the fire at its beginning stage.

Depending on the type of the flammable material and the manner of its oxidization, fires have been divided into five classes marked with the letters A, B, C, D, and F:

- **Class A** is comprised of fires with solids of organic origin, which while burning become incandescent, i.e., the burning process of wood, paper, synthetic materials, fabrics etc.
- **Class B** is comprised of the fires of flammable liquids and solids that melt from the heat emitted during the fire, i.e., the burning process of gasoline, alcohol, varnish, solvents, oils, greases, lubricants etc.
- **Class C** consists of the burning process of flammable gases, i.e., methane, acetylene, hydrogen, natural gas etc.
- **Class D** is comprised of light metals and other substances that react with water, e.g., fires of sodium, magnesium etc.
- **Class F** includes fires of kitchen fats and oils.

The fire-extinguishing devices are marked with the appropriate fire class letter symbols for which they are specifically designed.

The most frequently used types of portable fire-extinguishing equipment are: fire extinguishers, fire-extinguishing aggregates, water pumps, and fire-extinguishing blankets. The extinguishers and aggregates may be further subdivided according to the type of the fire-fighting substances into:

Snow (CO_2) extinguishers and aggregates — filled with compressed carbon dioxide as the extinguishing agent; the extinguishing action is caused by lowering the availability of oxygen with the introduction of carbon dioxide into the fire zone, and by the cooling effect resulting from gas decompression.

Powder extinguishers and aggregates — in which powders serve as the extinguishing agent; their extinguishing effect is based on the chemical inhibition of the burning process along the chemical's path.

Foam extinguishers and aggregates — the foam used in them cools down the flammable material and isolates it from oxygen.

Figure 1.

Fire-extinguishing equipment and substances (1)

EXTINGUISHERS	FIRE-EXTINGUISHING AGGREGATES	OTHER PORTABLE EQUIPMENT
▪ Powder	▪ Powder	▪ Water pumps
▪ Foam	▪ Water	▪ Water cannons
▪ Water	▪ Snow (CO_2)	▪ Fire-extinguishing blankets
▪ Snow (CO_2)		▪ Foam

Figure 2.

SNOW (CO_2) EXTINGUISHERS

SNOW EXTINGUISHER GS-5X

It is used for extinguishing the Class B and C fires.

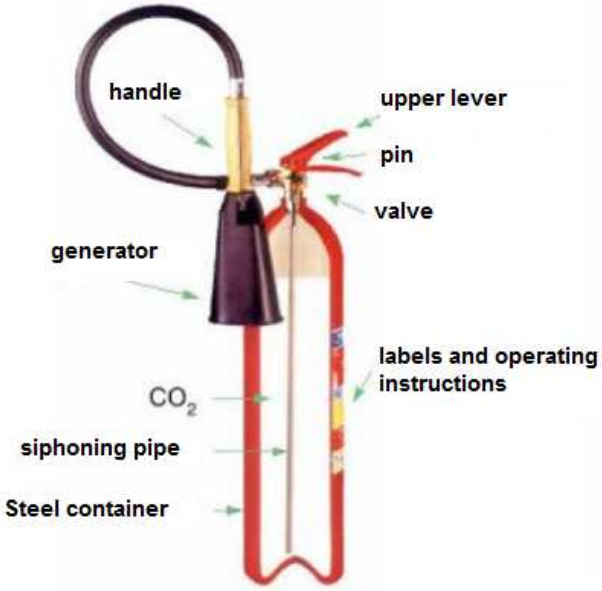


Figure 3.

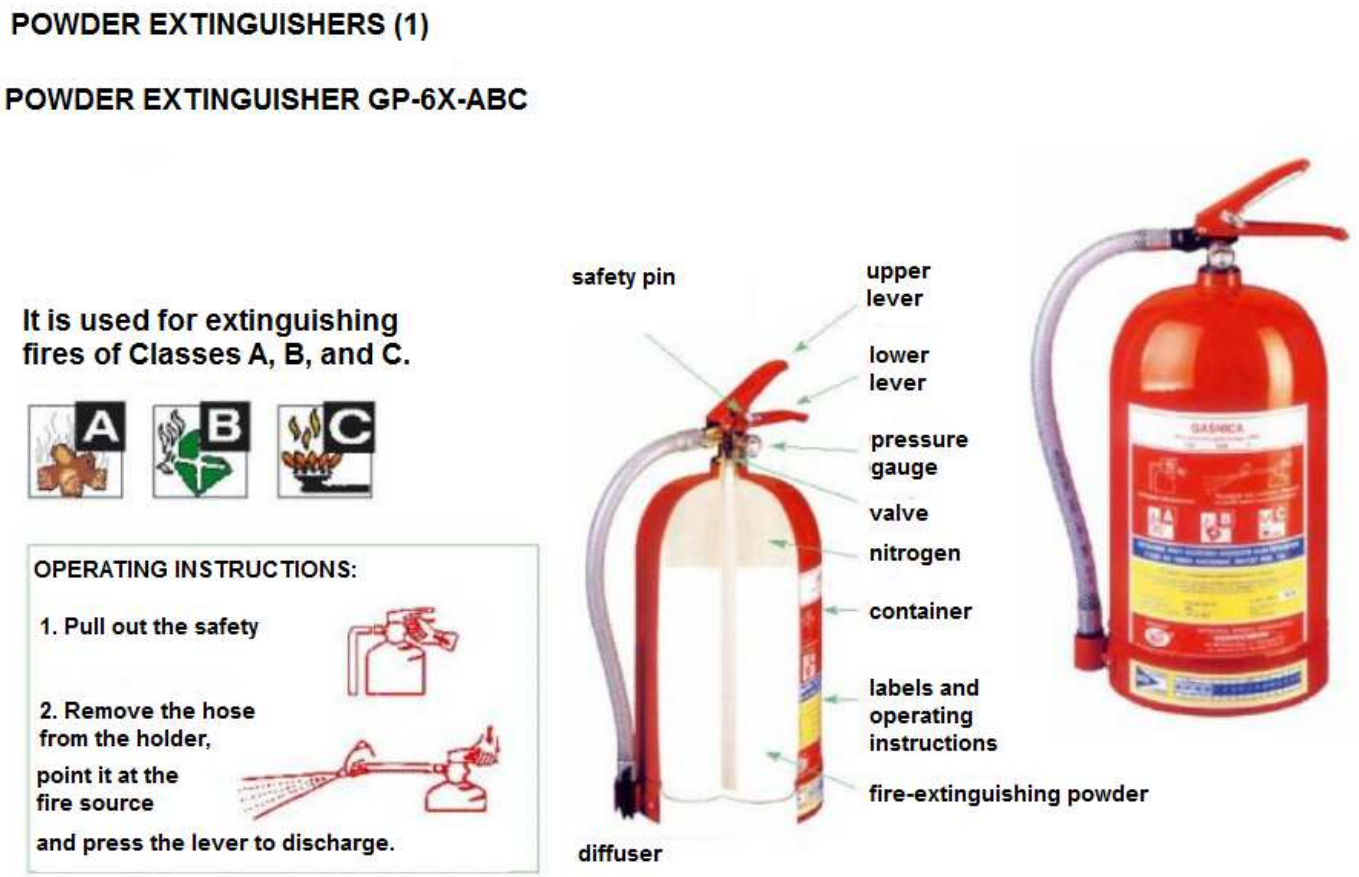

POWDER EXTINGUISHERS (1)
POWDER EXTINGUISHER GP-6X-ABC
It is used for extinguishing fires of Classes A, B, and C.
A
B
C
OPERATING INSTRUCTIONS:
1. Pull out the safety
2. Remove the hose from the holder,
point it at the fire source
and press the lever to discharge.
safety pin
upper lever
lower lever
pressure gauge
valve
nitrogen
container
labels and operating instructions
fire-extinguishing powder
diffuser

Figure 4.

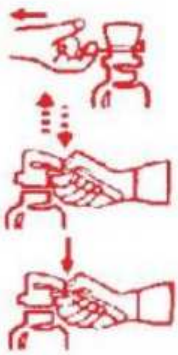
POWDER EXTINGUISHERS (2)

POWDER EXTINGUISHER GP-1ZX-BC (FOR VEHICLES)

It is used for extinguishing fires in Classes B and C

recommended for the fire protection of vehicles, motor boats, camping trailers

OPERATING INSTRUCTIONS:



1. Pull out the safety.

2. Press the valve lever release, let go of it and wait 3 seconds.

3. Press the lever again, point the spout at the fire source and discharge.

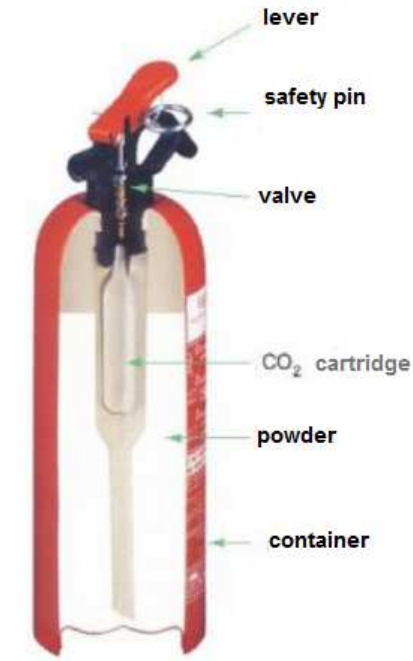
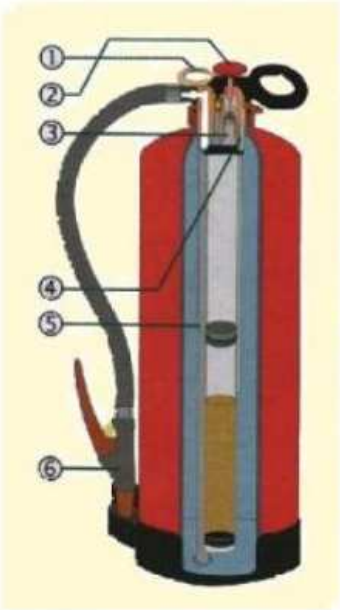


Figure 5.

FOAM EXTINGUISHERS

This fire extinguisher is filled with a water solution of a surfactant-reactive concentrate that acts as the fire-extinguishing agent.



1. Safety pin.
Remove the pin to unlock it.

2. Breaker.
Open the CO_2 cartridge by pushing the breaker inside. Carbon dioxide enters the extinguisher chamber triggering the forcing out of the foam-making solution.

3. Bottle with the propelling agent (CO_2).

4. Safety pipe.

5. A vertical pipe.

6. Hand-held diffuser
The intensity of the foam stream can be adjusted with the lever by the safety valve.

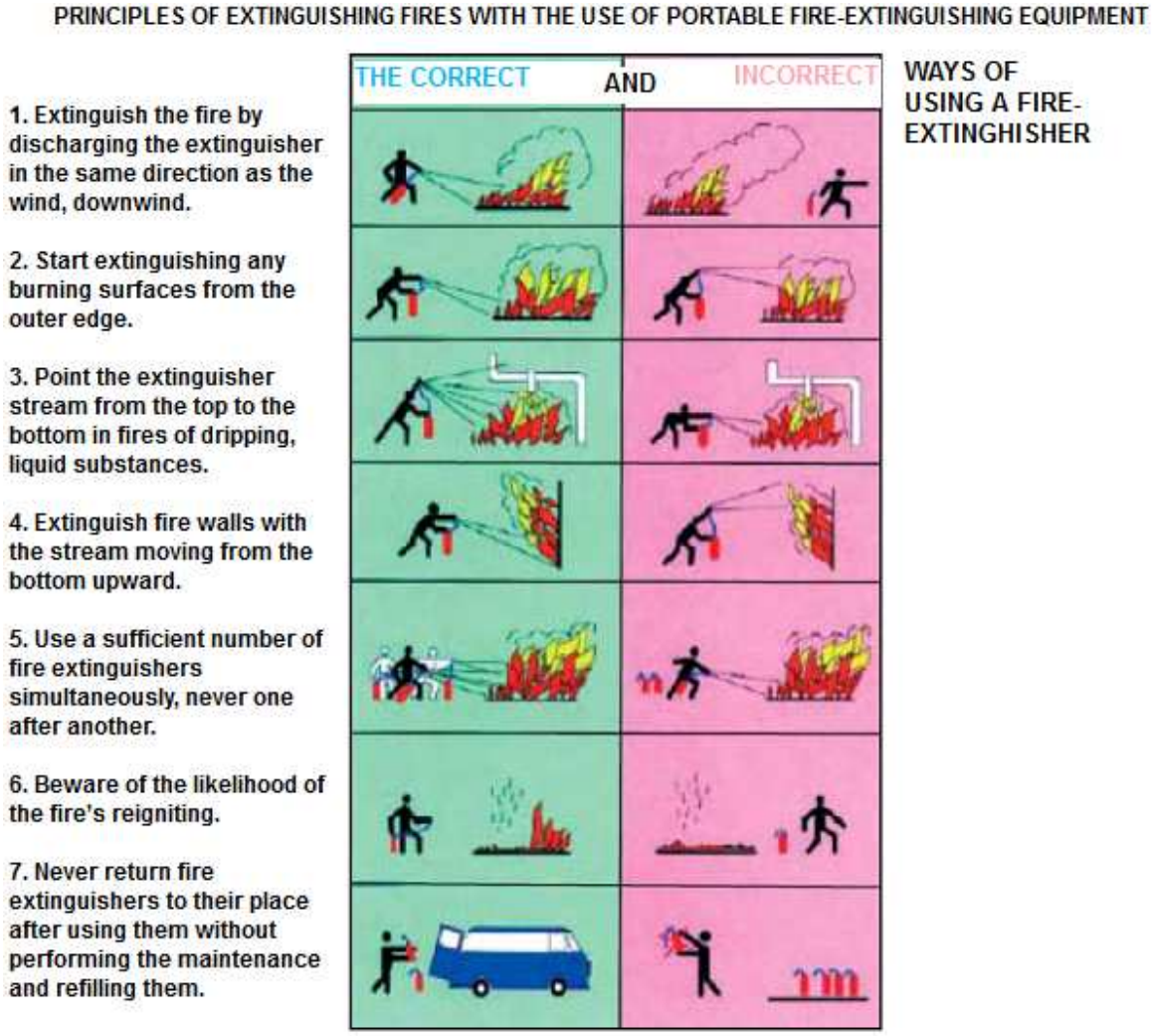
The commonly used extinguishers of this type are: GWP-06ZM GWO-9Z, GWP-9Z/L.

During a fire-extinguishing operation, you must keep in mind the following principles:

- Direct the flow of the extinguishing agent on the burning objects or the structure starting from the outermost side, and then move towards the center.
- While spraying objects that are in an upright position, move from the top to the bottom of the object.
- Use only those fire-extinguishing agents that are specifically designed for extinguishing a particular type of fire.

Class	**Type of burning material**	**Type of fire-extinguishing agent**
A	solids of organic origin that while burning become incandescent (wood, paper, fabrics etc.)	water, fire-extinguishing foam, powder, and CO_2
B	flammable liquids and solid substances that melt from the heat emitted during the fire (solvents, floor shines, melting synthetic materials)	Fire-extinguishing foam, powder, CO_2, and halon
C	flammable gases, i.e., natural gas, methane, and propane-butane	fire-extinguishing powder, CO_2, and halon

D	fires ABC occurring in high-voltage devices	fire-extinguishing powder, CO_2, and halon
F	kitchen oils and greases	synthetic substances AFFF [Aqueous film forming foams]



V. Evacuation rules and procedures

The efficient organization and carrying out of an evacuation requires good planning and performing it without chaos or panic. Therefore, the person responsible for managing it must evaluate the existing conditions. During a fire, it is advisable to conduct an evacuation only within the most threatened area, and a decision of evacuating further parts of the structure should be made only according to the degree of the fire's expansion.

- **Factors causing complications in evacuation of people**

Smoke inside structures and evacuation routes — the smoke, combustion fumes, and gases which comprise the products of fire spread very quickly and filter into to the distant areas of the building through the wall and ceiling openings for wiring, air ducts, and cabling; clearances and gaps around doors; and also through stairwells that connect different floors. Smoke is often the first sign of a fire that is hidden or difficult to reach. It irritates the respiratory tract causing coughing and suffocation, tearing of the eyes, and loss of orientation in a smoke-filled space. While being inside a smoke-filled space people become subject to a psychotic fear or even panic of getting poisoned, getting injured, losing consciousness or dying. Smoke concentration increases in the higher levels of the room and in the upper floors of a building, where smoke moves up together with the rising warm air heated up by the fire. Smoke density may become so high that ceiling lamps or evacuation signs may become invisible. Moreover, the hot smoke particles become heat carriers, thus causing the smoke to ignite the flammable materials along its way.

Toxic products of break-up and combustion — they result from the fire's thermal break-up of the finishing materials and interior furnishings. And they pose the highest danger to human life and safety because they are often colorless and odorless. From those among them, carbon monoxide, hydrogen cyanide, carbon tetrachloride, and phosgene are particularly harmful. Even their small concentration levels cause severe poisoning, oxygen deficiency to the brain, hypoxic complications, and loss of consciousness.

The exposure to high temperatures and flames — may cause a loss of access to the evacuation routes. It is a natural trigger of fear in people, making it impossible to evacuate, and it may also cause people to behave irrationally, incommensurately to the actual magnitude of the hazard.

Human behavior in hazardous conditions

Human reactions at the moment of discovering a fire vary widely and depend on many factors, i.e., gender, age, time of day, familiarity with the building, and the amount of lighting. Also, the differences in each person's reactions to the flames, the presence of smoke or the accompanying fire noises ought to be taken into account by the evacuation team that organizes and performs the evacuation. Fire is a sudden emergency that disrupts the usual functioning of a place. The natural reaction of a person is the surprise to the unpredictability of where and when it will strike. The element of surprise may be combined with the frightening sight of raging flames, the smoke paralyzing their breathing, and the sounds of scared people. If we do not counteract that, panic might propagate, as a cumulative manifestation of surprise and fear for one's life. Under panic, people lose control over their actions, overcrowding the fire exits, trampling over each other, and behaving aggressively. In these circumstances, steering their actions becomes virtually impossible.

Moving in smoky conditions

In most cases, smoke accumulates in the upper part of a room; and in the case of high fire intensity, the smoke-filled layer may come closer to the ground, taking over and filling most of the room. In high smoke concentrations people must move bent down, close to the floor in a room or a corridor, or in extreme conditions start crawling. In order to make breathing easier, it is recommended to hold a wet piece of fabric over the mouth as an air filter. While inside smoke-filled vertical spaces, e.g., stairwells, it is recommended to walk on all fours when going up, and to walk backwards on all fours when going down. This way helps to ensure a better awareness of where the stairs end, particularly in conditions of insufficient visibility. When searching a room for people who may have been left behind, it is necessary to check places where a person might be hiding, e.g., under a desk, in a closet, behind the curtains, or in other, seemingly unlikely or impossible places. In the eventuality of a hazard prompting the necessity of evacuation, of both people and their belongings, the decision is made by the president or a deputy. The evacuation decision must take into account the following factors: the range of the evacuation; number of people to be evacuated; the ways and manner of evacuation, including the identification of escape routes and their directions; and the anticipation of the necessary accommodation arrangements for the evacuees in the case of unfavorable weather conditions.

The rules for announcing an evacuation

In the case of a hazardous threat to the building that is about to be evacuated, it is necessary to alert immediately of the emergency and its particular type all employees present on the premises.

This announcement may be made by:

- Speaking directly to people
- Activating hand-pulled file alarms
- Activating the internal telephone alarm notification system

In case of severe danger all possible signaling methods must be used in order to alert the largest number of people.

General organizational rules for evacuation

- After activating the evacuation alert, the porter must open all building exits. After opening the doors, the porter must wait for the arrival of the Fire Department units and provide the necessary information to the commanding officer.
- In every room all of the appliances must be unplugged and switched off to reduce hazards during the fire-extinguishing and rescue activities. All employees are responsible for doing this.
- Employees have the duty to take the shortest route, following evacuation signage, to leave the building and arrive at the assembly area for the evacuees that had been selected in front of the building. While vacating a room, an employee should carefully check whether someone has not been left behind, keeping in mind that some people in a dangerous situation may hide under a desk, behind a cabinet, or behind a curtain. The employee should also take care of bringing out some particularly important documents.
- In case the of harsh weather conditions, the evacuees gathered outside the building should be counted, and transported to nearby shelters on buses supplied by the rescue services.

- Should the building evacuation become impossible due to heavy smoke concentration in the evacuation routes, or due to other factors making evacuation impossible, all persons present on the premises should remain inside rooms, seal off the clearances and openings to make the rooms smoke-proof, and try alert people on the outside about their presence and the need to be rescued. In such a situation, it is advisable not to open windows, since an increase in the amount of oxygen may hasten the spread of the fire. It is also important to stay calm and not succumb to panic.
- The commanding officer managing the evacuation appoints the persons responsible for the evacuation operation, determines the potential need for evacuating equipment or belongings, and defines methods, their sequencing, and the type of evacuated possessions.
- Of first priority is the evacuation of people in the areas where the fire started, or of those who are in the direct path of the spread of the fire, or from those places that are hard to exit and may be cut off by fire or smoke. Next, the evacuation should proceed with people at the highest floors. In all rescue efforts priority should be given to people with limited mobility, followed by those with full physical abilities. The lines of people moving through the building should be directed at the level of the evacuation routes, corridors, and then according to the directions indicated by the evacuation signs leading to the stairwells and exits away from the hazard area or outside of the building.
- In the case of a blockage of the evacuation routes, the commanding rescue officer must be immediately notified of the situation — by any available means such telephone, directly or with the help of people located outside of the cut-off fire zone. The people who get cut off from the emergency exits should assemble in the area most distant to the fire source; and, using any available means of rescue and according to the specific conditions, evacuate outside with the use of rescue equipment provided by the Fire Department units.
- The evacuation of property and belongings must not be conducted at the cost of the energy and means essential to evacuating and saving people.
- The evacuation of belongings should start with the most expensive equipment and documentation.
- At the end of the evacuation process, it is necessary to double-check that all people have left the rooms. In case of confirming the absence of a person, this fact must be immediately reported to the commanding officer of the rescue operation.
- Should another fire rescue unit arrive on the scene during the evacuation operation, the officer directing the operation is obligated to provide a short report on the course of rescue activities, and then conform to the orders of the newly-arrived unit's commanding officer.

Since it is difficult to predict all possible scenarios of the developing events, the evaluation of the evacuation conditions should include the consideration of the most unfavorable of possible situations such as intense smoke, maximum number of people, and night conditions. It is recommended — in order to verify the theoretical assumptions — to verify the likelihood of an evacuation. It will help determine the time necessary for a complete evacuation of people from the hazard area.

Instructions for persons involved in conducting the evacuation

Persons actively participating in the evacuation operation must adhere to the following rules and possess the skills listed below:

- Keep calm, without showing emotion, and refrain from useless discussions or arguments with others.
- Follow the commanding officer's orders who is managing the evacuation.
- Know the layout of the evacuation pathways and building exits.
- Know how to extinguish flames on people caught on fire.
- Know how what to do in a room filled with smoke.
- Know the locations and the operation of the alert system, other communication systems, and the portable fire-extinguishing equipment — extinguishers, water pumps, and fire-extinguishing blankets.
- Be extremely aware of the potential dangers or complications.

Instructions for evacuating people out of a building

In case of a fire or another emergency in a building it is necessary to conduct the evacuation according to the following order:

- The person who has noticed the fire acts according to the rules applicable to fire emergencies or other types of hazards.
- The responsible individual opens all evacuation exits.

- The evacuation should be conducted following the fire-exit signs, and the assembly point for the evacuees should be in a parking lot or a square in front of the building.
- The people responsible for a particular group of evacuees must lead them outside, bring them to the assembly point, and confirm their presence.
- The evacuation commanding officer must be immediately notified should there anyone be found missing.
- Everyone must keep calm during the evacuation, help with controlling the group's behavior, and also provide assistance to the people requiring assistance.

VI. Fire alarm alert, notification, and response procedures

All building personnel must actively participate in the evacuation of people and possessions as well as in the fire-extinguishing and rescue activities. The actions to be taken in response to a fire may be divided into two stages:

- between the moment of fire discovery and the arrival time of the Fire Department units
- between the arrival of the Fire Department units and the eradication of the fire.

1. Every person who notices a fire or another hazard whose consequence may be a fire outbreak, must keep calm, avoid panicking, and immediately alert:

   – people directly within the danger area or in its proximity
   – building owner
   – National Fire Department, tel. **998** or **112**

2. After making the fire and building evacuation notifications, a designated employee who follows a supervisor's order announces the emergency by phone or directly shouting:

   - In the case of a fire: **ATTENTION FIRE IN PROGRESS, FIRE!!!**

3. The person alerting the Fire Department should, after getting connected, provide the following information:

   – fire location — building name and detailed address
   – number of floors in the building threatened by fire
   – the floor level on which the fire started
   – what is burning
   – current size of the fire zone
   – whether it poses a life threat to people
   – whether there are any flammable materials close to the fire zone or nearby
   – from which phone the caller has dialed the Fire Department
   – first and last names of the caller

The person who has made the call may disconnect only after hearing a confirmation from the Fire Department dispatcher on duty. It is recommended for the caller to remain close to the phone afterwards should there be a verification call.

4. Should there be a need to contact other emergency service authorities — an accident, a utility breakdown, or a suspected bomb threat — here are their telephone numbers:

   – **Paramedics** **999 or 112**
   – **Police** **997 or 112**
   – **Gas utility service** **992**
   – **Electricity utility services** **991**
   – **City patrol units** **996**

5. The fire-extinguishing activities (with the use of portable fire-fighting equipment and hoses in the water hose cabinets) as well as the rescue activities must start and continue simultaneously with fire alerts.

6. All appliances must be unplugged and turned off prior to leaving each room.

7. While the fire is in its beginning stage, persons closest to it should evaluate the fire-extinguishing situation and undertake the necessary fire-fighting action.

8. The building manager or his/her deputy should direct the fire-fighting activities until the arrival of the Fire Department units.