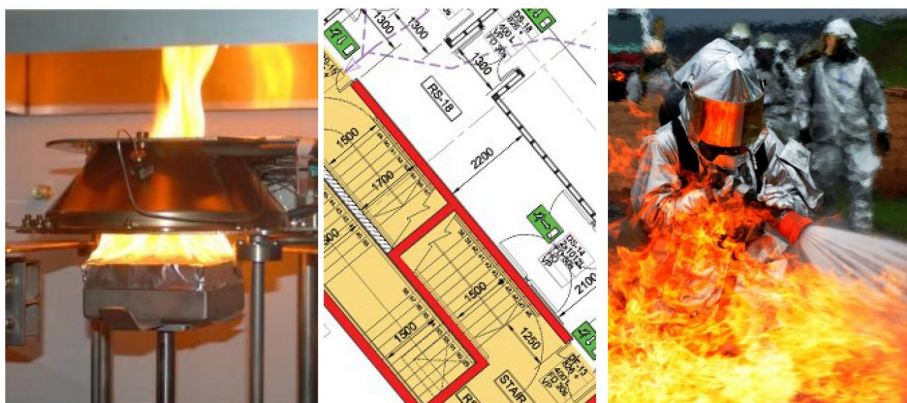


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ORGANIZÁCIA A VYKONÁVANIE VYHODNOCOVACÍCH CVIČENÍ

ORGANIZATION AND IMPLEMENTATION OF EVACUATION DRILLS

GERGELY HERCZEG¹, LÁSZLÓ KOMJÁTHY²

Abstract – Fire or other emergencies may justify evacuation of persons in buildings or open spaces. When evacuating, it is recommended to take the fastest way with the least possible damage. Evacuation drills can greatly contribute to the training of the participants, so that, in event of a real emergency, they can leave the building or hazardous open space as quickly as possible. Evacuation drills can be effective in training. For this to happen, it is necessary to properly plan, organize and efficiently implement the drills. I present in this publication some possible solutions to be considered when organizing and conducting evacuation drills.

Keywords – fire drill, evacuation drill, evacuation

INTRODUCTION

In Hungary, according to Ministry of Interior Decree No 54/2014 (5 December) on the National Fire Protection Code life protection includes ensuring the escape and rescue of endangered persons. [1] Regular evacuation drills of persons in buildings may contribute to the realization of this goal.

According to Section 19 of Act XXXI of 1996 on Fire Control and Technical Rescue and the Fire Department, the preparation of fire protection rules is mandatory for private persons and legal entities involved in business operations. [2] Those who are mandated for such, in accordance with Ministry of Interior Decree No 30/1996 (6 December) on the Preparation of the Fire Protection Rules, as an Annex of the Fire Protection Rules must prepare a Fire Alarm Plan pertaining to buildings, building portions and open spaces operated by them, which must contain the mode of evacuation regarding buildings, building portions and open spaces. The implementation of this must be exercised by evacuation drills as often as necessary, but at least once per year. [3]

Although evacuation drills disturb the daily routine of the facility, partly as a result of regular drills behavior changes do not appear which can be observed during real emergency situations, such as the initial shock reaction, childish conduct, physical and mental paralysis, etc. [4] Sometimes persons in the building do not com-

mence escape when the fire alarm sounds, since they cannot interpret it properly or do not react to it appropriately. [5] It also happens that few people use the emergency exits specifically designed for emergencies, they rather use the main entrance that also functions as emergency exit, especially if the former are not opened. [6]

1. ORGANIZATION OF EVACUATION DRILLS

The building's operators must be consulted prior to the evacuation drill regarding the time of the drill. It is expedient if among the participants only persons in management positions are informed regarding the time of the evacuation drill. It is advantageous if during the evacuation drill the participants are surprised by the drill, thus simulating the surprise experienced at a time of an actual emergency that necessitates evacuation (e.g. fire event). It is expedient to conduct the evacuation drill simultaneously with all the elements of a fire drill, meaning to approximate the implementation requirements of an actual fire event. Thus, in the course of organization the required tasks involved in the drill must be considered, such as the handling of fire protection equipment, stopping technological processes, shutting off public utilities as necessary, simulated fire extinguishing, simulated rescue of persons, simulated rescue of objects (e.g. works of art), simulated animal rescue (e.g. at animal facilities), maintaining order (e.g. in the case of a shopping center) etc.

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In the case of particularly significant objects, beside fire extinguishing the rescue of objects may also be part of damage control. [7]

In the case of transportation facilities (e.g. railway stations, metro stops etc.) mass passenger traffic requires special preparedness from employees. At fire events in underground railway facilities, as a result of effective smoke control, by channeling out heat and smoke or by available ventilation equipment, the smoke may be shifted thereby providing air to escaping persons. [8] Consequently, switching the channeling of heat and smoke in the appropriate direction requires practice on the part of the staff, an opportunity for which can be created during an evacuation drill.

The evacuation drill can be conducted under ideal weather conditions (e.g. no precipitation, warm weather with calm wind conditions etc.), technological conditions (e.g. normal operational status without an event, usual conditions etc.), but it can also be tested if the participants are capable of conducting the evacuation irrespective of these conditions. For this reason, it is recommended to conduct the evacuation drill under unfavorable weather conditions (e.g. rain, cold, strong wind etc.) or technological conditions (e.g. extraordinary operational status with an event, unusual conditions etc.) as well.

If we wish to prepare unpracticed persons for actual emergency reaction, the first drill may be conducted with prior notice to the participants and under optimal conditions. During subsequent drills we can approximate the conditions of an unexpected emergency by not providing prior notice and with unfavorable conditions.

It is expedient to conduct the evacuation drill under the most unfavorable operational conditions from a safety aspect. This may mean the highest number of persons present (e.g. in a shopping center, theatre, in a factory at shift change), with the allowable least number of security staff present etc.

It does not sufficiently serve the preparation of the participant if e.g. in a kindergarten the children are lined up at the exits fully dressed up and they wait for the alarm. Or if in a school we inform the students in advance about the time of the evacuation. It is also not expedient in the case of a shopping center or hotel if only the staff participate in the evacuation while the shoppers and visitors or guests do not. Specifically, in this case the staff cannot practice (although it would be advisable) the handling of often uninformed and confused persons or crowds.

From the aspect of an evacuation of a metro stop the most unfavorable situation means two trains arriving at the same time with the largest possible number of pas-

sengers, while there is a significant crowd gathered on the platform preparing to board, and the escalators are also crowded.

It is also advisable to prepare the participants of the evacuation drill at a theoretical training for the conditions of the drill and the reaction to an actual fire event. This preparation can be very practically conducted in the framework of fire safety training. In the case of such theoretical training, it is useful if the participants get to know the layout of the building or the open space, the possible escape routes, emergency exits as well as the alarm options and methods for those present in the building or the open space. The theoretical preparation may primarily be based on the fire alarm plan, if such has been written. If it has not, it is advisable to write one.

The fire alarm plan, as an Annex of the Fire Protection Rules, may only be written by a qualified person, duly authorized by law. [9]

2. IMPLEMENTATION OF EVACUATION DRILLS

It is advisable to implement evacuations according to the following. The person organizing the drill – at a time coordinated with managers – verbally informs staff in the building that an evacuation drill will be conducted, and that they should give the alarm to persons present in the building, and then commence the evacuation.

In order to make the evacuation drill's process controllable in time, comparable with other drills and assessable, it is advisable to clock the time of conducting the drill, meaning to determine the duration of the evacuation drill.

During the drill, the first person who is informed of the fact of the drill should give the alarm to persons present in the building in the usual manner (according to the Fire Alarm Plan). This alarm may be given verbally, by an alarm bell, a sound signal, by phone or by a built-in fire detector, etc. The duration of the evacuation drill is the time that passes before the evacuation plus the duration of the evacuation. In the process of implementing the evacuation drill it is expedient to create conditions that approximate the conditions of an actual fire as much as possible, so the participants can practice their tasks under conditions that are similar to reality.



Fig. 1.: Evacuation drill

Therefore, in a building that has a built-in fire detector/alarm, it is advisable to perform the alarm by using the built-in fire detector/alarm, thus the participants can get to know the sound signal which calls for the immediate evacuation of the building. In buildings where there is no built-in fire detector/alarm, the alarm to the persons present in the building should be given by using an installed signal bell network (e.g. in the case of schools), or amplified audio. In open spaces amplified audio may be one of the methods for giving alarm to the persons present in the endangered area, verbally or by a prerecorded audio message. In buildings where there is no other way of giving alarm to the participants, a walkthrough of the building and verbal alarm may be an option.

Initiating the channeling out of heat and smoke makes unusual air pressure conditions, noises and air flows perceivable. Non-emergency elevators controlled by the built-in fire detector/alarm are sent to the exit level and are stopped there.

The controlled fire prevention and smoke prevention doors shut. Every one of these is an effect that is divergent from normal operational status, thus it is advisable to prepare for these effects by practice. In an actual emergency situation it is expedient if operational lighting in the facility provides light for the purpose of escape as long as possible. On the occasion of evacuation drills it should be considered to approximate the drill to an event that requires higher focus and results in higher stress by turning off operation lighting and only keeping emergency lights on. This can be considered in buildings where such a system has been installed.

Approximating the drills to actual fire events may also be provided by implementing them where participants are in safe smoke (fog) created by the appropriate smoke (fog) producing devices.

A sufficient number of staff must be available to assist persons in escaping or for the rescue of persons. It is

expedient to conduct the evacuation drill under conditions that approximate normal operational conditions, but absolutely not under the most favorable operational conditions. In a hospital, for the evacuation drill the lower number of staff during the periods on weekends, in the afternoon or at night may be suitable. In these periods the number of staff available for rescue generally differs from the optimal, thus it requires greater preparedness and allows for more effective drills. Based on experience, situations with the most patients per number of staff occur during the night shift. [10]

Guiding the persons who exit the building may also be a serious task. This can facilitate the persons who exit the building to try to move away from the building, because their presence may hinder or slow down further escape and rescue. This guiding may be performed by a handheld loudspeaker devices, which are handled by assigned staff positioned in front of the building's exits. It is advisable to print preplanned and effective crowd control instructions on these.



Fig. 2.: Evacuation

In order to ascertain the completely evacuated status of the building, it is expedient to take a headcount or to survey the building. Simultaneous application of these two methods increases effectiveness. It is clear from the above that a successful headcount can only be conducted in the case of buildings where there is reliable data regarding the number of persons inside (e.g. nursery, kindergarten, school, office building, etc.). If the data might be inaccurate, it is advisable to survey the building.

In the case of buildings where there is no reliable data regarding the number of persons inside (e.g. shopping center, theatre, etc.) taking a headcount is not an effective way to ascertain the completely evacuated status of the building. In such cases, checking the success of the evacuation drill may require a survey. It is advisable for multiple persons to conduct the building's survey, according to a specific method that is suitable to inspect the entire checked area.

SUMMARY

Preparing a fire alarm plan is part of the planning of an evacuation drill, or if preparing this is not mandatory, it is advisable to prepare a plan similar to it. The ready fire alarm plan is effectively applicable to the planning of an evacuation drill. Evacuation drills require careful planning and organization to achieve their goals. In the process of organization unforeseeable and unpredictable circumstances must be taken into consideration. Foreseeable may be the number of participants and the operational condition, etc. Unforeseeable or difficult to predict may be weather conditions and extraordinary events, etc.

In the process of organization and implementation it is advisable to follow the plan. Documenting the implementation provides an opportunity to subsequently analyze the evacuation drill, which may be useful during the future preparation of the participants or become the basis for a modification of the fire alarm plan.

By the careful planning and implementation of evacuation drills the preparation of the participants and thereby proper reaction to a fire event becomes possible.

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