

Fire safety standards in Romania

Robert-Nicolae Boștinăru
University of Pitesti
bostinaru.robert@gmail.com

Nicu Bizon
University of Pitesti
nicubizon@yahoo.com

Abstract - This paper presents an overview of the meaning of fire safety standards and regulations governing the activity of warning, authorization of fire detection, signaling and warning installations. There is a serious case of non-compliance with the law with devastating consequences and the need to constantly update legislation and regulations to limit the consequences underlying such events with major consequences in society. Also, fire detection, signaling and extinguishing equipment are briefly compared in terms of advantages, disadvantages and performance.

Keywords-fire, fire safety, regulations, disasters

I. INTRODUCTION

Every day, worldwide, fires cause loss of life, injury and property damage. This nuisance causes more damage and loss of life than calamities caused by the forces of nature [1]. As a result, security and firefighting have become particularly important [2]. The risk of fire is the most common risk that occurs in the national territory, its production being an emergency situation, a phenomenon that produces effects in important areas of economic and social life, such as construction, installations, landscaping, forests, means of transport, agricultural crops, etc. [3]. Consequently, fire safety has been and is a major concern for every community [4-7].

Preventing, establishing and combating the underlying causes of fire is a real problem for the authorities empowered to carry out such activities [8-12]. In addition to the unpleasant side, fire cases also have a beneficial effect on the information they provide to the investigation teams of the underlying causes of the event, namely that it provides information on the cause of the event, the error or errors, which favored the occurrence of the event, the possible malfunctions of the electrical and electronic equipment that contributed to its production, the ways to prevent and combat so that in the future such events will not be repeated [13-19].

Collecting information from reports on the underlying causes of fire is a valuable job in updating fire safety legislation, in developing fire detection equipment, in developing fire alarm equipment, in developing fire extinguishing equipment. fires, in the development of construction materials in order to increase fire resistance, in updating fire safety scenarios, etc.

The aim of this paper is to present a brief overview of fire safety standards and specific regulations in this area in order to avoid or limit the consequences

underlying the occurrence of such events with major consequences in society. The novelty and the main contributions of the paper are the following:

- this is the first attempt to systematically present fire safety standards and regulations governing the activity of warning, authorization of fire detection, signaling and warning installations;
- national and international bodies and organizations are presented;
- the activity of the IGSU General Inspectorate for Emergency Situations is briefly presented;
- the compartment in the IGSU car is presented, which deals with the verification, authorization and promotion of Fire Safety;
- the national laws and regulations underlying Fire Safety are listed;
- some fire detection, signaling and extinguishing equipment are briefly compared in performance;
- an intensely nationalized case study at national and international level in terms of current fire protection standards and norms is presented and analyzed.

II. THE INSTITUTION THAT CONTROLS THE FIRE SAFETY NORMS IN ROMANIA

In Romania, the institution authorized to carry out activities of prevention and management of emergency situations is the General Inspectorate for Emergency Situations (IGSU), which was established in 2004, until this date the civil protection and firefighting measures were carried out. by the Inspectorate General of the Military Fire Brigade and the Civil Protection Command, institutions under the coordination of the Ministry of Interior.

The main objective of IGSU "is to streamline the prevention and management of emergencies in order to control risks and ensure the normality of human life, and is achieved through a wide range of activities to prevent and intervene in fire, release and first aid SMURD, rescue and limitation of damage caused by floods, landslides, seismic movements, epidemics, epizootics, snow, drought, assistance to people in critical situations, intervention in technological,

radiological, nuclear, biological or other natural disasters or caused by natural disasters. man".

IGSU coordinates the actions of the institutions involved in the management of emergency situations, ensuring also the function of national contact point in relation with the international governmental and non-governmental organizations with attributions in the field.

At national level, the prevention activity is provided by the specialized structure within the General Inspectorate for Emergency Situations, called Prevention Inspection.

The main forms of prevention activity are:

- regulation, approval, authorization, agreement, control, specialized technical assistance, preventive information of authorities, bodies, stakeholders and the population, as well as their preparation for emergencies, audit of certified natural and legal persons, finding and sanctioning violations legal;

- market surveillance, as well as the recognition and designation of conformity assessment bodies for products with a role in meeting the fire safety requirement are forms of prevention activity that are carried out through specialized structures at national level;

- the control of the activity of the evaluation and certification centers of the competence of the personnel carrying out activities in the field is done by the Prevention Inspection and, as the case may be, by the county inspections, in accordance with the law;

III. THE CONCEPT OF FIRE SAFETY

Fire safety refers to the condition of a product, process or service in which the possibility of endangering persons or causing material damage is non-existent, limited or controlled to an acceptable level.

In accordance with the regulations in force, the essential fire safety requirement requires that all constructions be designed and executed in such a way that in case of fire damage the conditions of protection and evacuation of personnel from the premises are ensured, the spread of fire is limited and to ensure the rapid intervention of professional personnel specialized in extinguishing fires in conditions of maximum safety.

The national legislation provides by Law no. 307/2006 amended by Government Ordinance no. 70/2009, OG no. 89/2014 and Law no. 170/2015 - on fire protection, as "Fire protection is the integrated set of specific activities, measures and organizational, technical, operational, humanitarian and public information tasks, planned, organized and carried out according to this law, in order to prevent and reduce fire risks and ensuring operational intervention to limit and extinguish fires, in order to evacuate, save and protect endangered persons, protect property and the environment from the effects of emergencies caused by

fires" provides mandatory regulations for individuals and fire protection [10-12].

Technical regulations on fire safety [12]:

- Fire safety. Technical standards for fireproofing of combustible materials and wood and textile products used in construction (C58-1996);
- Fire safety regulations for buildings (P119-1999);
- Manual with examples, details and solutions for the application of the provisions of the fire safety regulations P 118-1999 (MP 008 - 2000);
- Specify techniques for fire extinguishing systems using FIREPRO aerosol dispensers (ST 040 - 2000);
- Guide for fire verification of structural elements of steel constructions (GP 055 - 2000);
- Norm for the fire inspection of the structural elements of steel constructions (NP 046 - 2000);
- Guide for the design, execution and operation of devices and systems for the evacuation of smoke and hot gases from buildings, in case of fire (GP063 - 2001);
- Guide to fire risk assessment and fire safety in crowded rooms (GT 030 - 2001);
- Guide to fire risk assessment and fire safety for health buildings (WG 049 - 2002);
- Guide for fire risk assessment and fire safety for nursing homes and people with disabilities (WG 050 - 2002);
- Design guide for water fog fire extinguishing systems (GP 069 - 2002);
- Norm regarding the design of special constructions and installations regarding the prevention and extinguishing of fires (NP 071 - 2002);
- Norms for fire prevention and extinguishing specific to activities in the field of public works, transport and housing (NP 073 - 2002);
- Fire safety regulations for underground car parks (NP 127: 2009);
- Normative regarding the fire safety of the constructions, Part II - Extinguishing installations (P 118 / 2-2013);
- Regulation on fire safety of buildings, Part II - Fire detection, signaling and warning installations (P 118/3 - 2015);

All these regulations create the legislative framework on the technical regulations that must be observed with regard to fire safety.

Fire safety objectives to be considered in design, execution and operation:

- Limitation of injuries and casualties;
- Limitation of material damage;

- Limiting environmental pollution;
- Limiting the production of damages on the architectural, historical and cultural heritage;

IV. CASE STUDY OF NON-COMPLIANCE WITH FIRE SAFETY REGULATIONS

An intensely publicized case at national and European level is the “COLLECTIVE” case, this case is the biggest man-made disaster Romania has faced in the last 25 years [19].

The unpleasant event took place on October 30, 2015 in a hall of the former Pionierul factory, in this room operating the Colectiv club, it operated without a fire safety permit.

The fire in the Colectiv club was caused by the fireworks used during the concert, the space was soundproofed with polyurethane sponge (slightly flammable) so that the spread of the fire throughout the hall was favored. Approximately 400 people attended the Goodbye to Gravity free concert, well over the declared number of 80 people to get permission.

The thread of the event is as follows:

- The concert starts at 21:00;
- At 22:30 the pyrotechnic effects are launched;
- At 22:32 the first call was made to 112 for a fire;
- From that time on, hell broke loose;

The event that took place on October 30, 2015 at the Bucharest Collective Club resulted in the death of 65 people, including 63 Romanians and one Italian, and the injury of 163 people, including 159 Romanian nationals, two Spanish citizens, Germans and Dutch.

Due to non-compliance with the legal provisions on fire safety, these events were unpleasant and had a devastating impact on society.

The main regulations that were not applied in this case were identified as follows:

- The building had no fire detection, signaling or extinguishing system
- There were no smoke vents
- The access road was not designed properly, given the large number of people present at the event
- He did not have a fire safety permit

If there were fire detection, signaling and extinguishing equipment inside the club, such an event could have been avoided.

Criminal proceedings have been filed in the case and the culprits have been held accountable, the final sentence was handed down on May 12, 2022, the result being the conviction of the guilty and the payment of moral and material damages amounting to 46 million euros.

The equipment for detecting, signaling and extinguishing fires is diverse and depends on the manufacturer, of which may be mentioned:

- Polish-Alfa
- Fireclass
- UNIP
- Fireray .

TABLE I. FIRE ALARM SYSTEMS

Nr. Crt.	Producer	Name	Specify techniques
1.	Polon-Alfa	Polon 4100	-2 loops with 64 addresses -3 supervised relay outputs -2 monitoring inputs -supervised signaling line -240x320 pix graphic -EN 54-2 display
2.	Bentel	FC500	-1 or 2 loops -up to 250 addresses on the loop -64/128 programmable software zones -16 programmable OC output (8 monitored) -fire and fault output relay -RS485 interface: up to 8 repeaters and 4 multi functional Interface -EN 54 certified
3	UNIP	FS4000 / 2	-Fire detection lines: max. 32 -monitored fire alarm lines 2 outputs -relay outputs: 2 -RS 485 interface for network connection

Among the above-mentioned equipment, the best wire control panel is Bentel FireClass FC 500 because it has a large number of addresses (250), has the possibility to program software 128 zones and fully complies with the SN EN 54 standard.

CONCLUSION

Fire safety is a very important area that should not be neglected, it needs increased attention and an acute need to update regulations, they need to be updated frequently to keep up with technology and the evolution and needs of society.

Failure to comply with fire safety regulations can have serious consequences for the health of the population, the prosperity of society and the environment, and why not for the perpetuation of the human species.

Experts in the field, companies producing materials and equipment, civil society with proposals and solutions to improve fire safety must come to support the updating of regulations.

Thus, the main findings of this paper are the following:

- The updated legislation in tandem with the evolution of technology is presented;
- A case study is analyzed from the point of view of fire protection standards and norms, highlighting the irregularities identified by the commission of specialists in the field.

It is worth mentioned that there is a need to set up a new organization comprising experts from all national bodies and organizations to draw up regulations and rules. National and European standards should also be more accessible to be consulted by anyone in need.

The next paper will focus on the detailed comparative presentation of fire detection, signaling and extinguishing equipment, highlighting their advantages, disadvantages and performance.

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