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SPECIAL ISSUE ON "SCIENTIFIC-PRACTICAL INNOVATIVE FOUNDATIONS OF FIRE SAFETY AND PREVENTION OF SERIOUS CONSEQUENCES"

The Study of Modern Fire Protection Technologies For Effective Fire Extinguishing.

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Abstract:

Fire extinguishing installations must ensure the localization or elimination of fire. Fire extinguishing installations are structurally divided into aggregate and modular, according to the degree of automation - into automatic, automated and manual, according to the type of extinguishing agent - into water, foam, gas, powder, aerosol and combined, according to the method of extinguishing - into volumetric, surface, locally volumetric and locally surface. Automatic fire extinguishing installation (AFEI) is a fire extinguishing installation that automatically triggers when the controlled fire factor(s) exceed the thresholds in the protected area. A distinctive feature of automatic installations is their performance of automatic fire alarm functions. At the same time, all automatic fire extinguishing installations (except sprinkler ones) can be operated manually and automatically. Sprinkler fire extinguishing systems are activated exclusively automatically.

Key words: *Fire, Sprinkler, water, foam, gas, powder, aerosol, automatic fire extinguishing, generator, extinguishing aerosol generators.*

Introduction

Automatic fire extinguishing installation (AFEI) is a fire extinguishing installation that automatically triggers when the controlled fire factor(s) exceed the thresholds in the protected area. A distinctive feature of automatic installations is their performance of automatic fire alarm functions. At the same time, all automatic fire extinguishing installations (except sprinkler ones) can be operated

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Buildings, structures and structures must be equipped with automatic fire extinguishing installations in cases where fire extinguishing by primary fire extinguishing means is impossible, as well as in cases when maintenance personnel are in protected buildings, structures and structures around the clock.

Automatic fire extinguishing installations must ensure the achievement of one or more of the following objectives:

- elimination of a fire in a room (building) before the occurrence of critical values of fire hazards;
- elimination of a fire in a room (building) before the fire resistance limits of building structures;
- elimination of a fire in a room (building) before causing the maximum permissible damage to the protected property;
- elimination of a fire in a room (building) before the danger of destruction of technological installations.

The type of automatic fire extinguishing system, the type of extinguishing agent and the method of its supply to the fire are determined depending on the type of combustible material, spatial planning solutions of the building, structure, structure and environmental parameters.

In real conditions, fires can occur in places that are difficult to reach for the delivery of dispersed and foam extinguishing agents supplied by stationary fire extinguishing systems with the formation of numerous "shadow" zones. For these reasons, stationary fire extinguishing systems often provide only fire localization. In addition, a number of installations according to the principle of operation are intended only for fire localization. These include automatic fire-blocking shutters and doors, water curtains, etc.

In connection with the above, the use of automatic fire extinguishing systems assumes mandatory participation in the liquidation of a localized fire of operational fire protection units or voluntary formations. Gas fire extinguishing systems are used at facilities where maximum safety is required and at the same time a minimum number of people are present. They are successfully used in museums, archives, libraries, and document repositories. They reduce the oxygen content and temperature in the epicenter of gorenje. However, the gas generated during operation is dangerous for people. This also applies to powder systems that cool the flame with a special powder.

Ignition in a large area is most effectively extinguished by foam fire extinguishing systems. Their use is justified in facilities with flammable substances. However, it is worth considering the toxic nature of the foam and the difficulty of restoring documents and things after its application.

Automatic water extinguishing systems are a traditional method that does not harm human health and the environment. Nevertheless, water is dangerous for equipment, electronics, and documents. A powerful pumping station is required for the operation of such installations.

The splinker automatic fire extinguishing system acts on the fire with water, foam by means of sprinklers. They are not used at facilities where explosive substances are stored, they are not effective in extinguishing power grids. There are several types of such systems that differ in the way they are fed:

- the water supply provides cooling of the flame with extremely small drops of water;
- the air supply differs in that air is used first, and then water is supplied through the system;

- the drainage system provides for the start of extinguishing not when the temperature at the facility increases, but when a fire alarm signal is received.

Fig.1. AGS-7/2 fire extinguishing aerosol generator.

This system is aimed at interrupting the chain reaction that causes gorenje. During a fire, a fire extinguishing aerosol generator is triggered. After the solid charge flares up, the aerosol is sprayed in the form of a cloud of tiny particles. The room is filled with it, and the fire is localized.

The suspension state is maintained by aerosol for 40 minutes. At this time, it is possible to gradually reduce the temperature of the fire, reduce heat generation – as a result, the flame goes out. Even when the fire extinguishing module is turned off, the aerosol suspension stays in the room for 15 minutes, so the risk of re-ignition is minimal.

Automatic aerosol fire extinguishing systems have the following advantages:

- easy operation;
- high fire extinguishing efficiency;
- application in various conditions;
- easy installation, no purchase of additional equipment required;
- no need to recharge the generators – they are always in working condition;
- all items and documents remain intact;
- the aerosol is harmless to humans and the environment;
- relatively low installation cost.

Almost the only drawback of aerosol extinguishing is poor visibility due to dense spraying. This makes it more difficult to evacuate people. In addition, the aerosol is not applicable when extinguishing self-igniting materials that smolder for a long time.

The versatility of using aerosol fire extinguishing systems allows them to be installed with the same efficiency:

- in rooms where there is electrical equipment that operates under high voltage (transformer substations, electrical cabinets);
- in any public transport, including urban, railway, sea, river;
- in residential premises, offices, retail premises;
- in car parks, warehouses, garages, storages;
- at production facilities and laboratories.

You can purchase everything you need for aerosol fire extinguishing directly from the manufacturer – the NPG Granit-Salamandra company, specializing in the production of this equipment and components.

The choice of a fire extinguishing system should be entrusted to qualified specialists who will competently create a project, taking into account the design and functional features of the room and the likelihood of fire.

Air—cooled fire extinguishing aerosol generators are devices that successfully combine the advantages of many other types of generators. They are compact, while providing high fire extinguishing efficiency in a variety of conditions. A distinctive feature of EAG with air cooling is that the aerosol produced can be released through a special slit nozzle. This technical solution significantly improves the operational characteristics of generators.

EAG air-cooled, designed to protect against fires:

- electronic equipment;
- cars, buses and other vehicles (in this case, the stability of generators to vibration loads is of great importance);
- power electrical installations (including high-voltage ones).

The company produces six models of air-cooled generators designed for different volumes (the value of this parameter varies from 2.2 to 48 m^3 depending on the model). In addition, the models differ from each other in operating time and weight.

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