

FIRE PROTECTION OF AN AIRPORT

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The aim of this work is to analyze and design the fire protection of buildings on the Kosice airport to meet all the requirements for safe operation. Chapter one defines fire protection facilities such as the documentation used and described the legislation. Part two focuses on the technical and technological equipment fire objects such as escape routes, access roads, signage and fire extinguishing equipment itself. Part three describes the different buildings and airport facilities in general and in the last part of the target. A separate part is devoted to the analysis of the fire protection facilities at Kosice airport and the specific descriptions of fire security as well.

Key words: Airport, fire protection, fire rescue service, fire fighting systems, escape route

1 INTRODUCTION

Fire safety in buildings is the ability to defend buildings and loss of life, personal injury and loss of property in case of fire. This is achieved by a suitable layout, construction and building material solution, or fire safety, technical or organizational measures.

2 TECHNICAL AND TECHNOLOGICAL FIRE PROTECTION FACILITIES

The operator of each facility, the building must procure and install the facilities, equipment and premises with regard to the risk of fire equipment to supply water for fire fighting, other extinguishing agents, fire fighting equipment, material means of fire protection, fire install elevators, evacuation lifts, technical ensuring escape routes, means a declaration of fire alarm, suitable types of fire-fighting equipment, operate in a functional state, ensure the implementation of the control and maintenance of the qualified person, if so provided by law to keep and retain documentation of their operation.

Select and maintain continuously available escape routes, emergency exits and access routes, boarding areas and access, as well as access to cap distribution facilities of electricity, gas, water for fire-fighting equipment, equipment for the declaration fire alarm systems, fire water if water sources for fire fighting.

It is also obliged to inform without delay the competent department of Fire and Rescue Service fire everyone who was in the buildings, premises or things in the possession, administration or use and provide necessary documents, cooperation and assistance in determining the cause of fire.

The fire hit from outside or inside the building is proposed access road, boarding areas, indoor and outdoor access routes. This is very important because at the outbreak of the fire, every second and expensive due to the poor access road may extend the time for fire fighters to start a fire rescue. In developing the fire plan of the building should be taken into account with respect to this factor.

2.1 Escape route

The escape route is permanently free communication or space in a building or on it, allowing

safe evacuation of people from the building or fire compartment fire threatened the open air or in an area that is not threatened by fire.

Escape routes to the degree of protection afforded by escaping persons, divided into:

- unprotected
- partially protected
- protected

Unprotected escape route is an escape route, which is not protected against the effects of fire and fire that leads from the east section of the building to open space to the east or to partially protected escape route or a protected escape route.

Partially protected escape route escape route is to:

- in the zone without the risk of fire or
- passes through part of the fire compartment, which is no fire risk,
- passes adjacent zone, which are not included in the establishment of the 6 or 7 or in which the value of the coefficient of flammable materials is not exceeding 1,1.

Protected escape route is an escape route that leads to the exit from the building to the open air or in an area that is not threatened by the fire, is separated from other fire compartments fire separating constructions and fire closures, is ventilated and allows safe movement of people.

Lighting and identification of escape routes

Escape routes must be in place during the operation of natural light or artificial light. Protected escape routes and partially protected escape routes, unprotected escape or escape replacement options that are designed to leak more than 50 persons, shall be equipped with emergency lighting. To the east of the building to the open air is not directly visible, it must be marked escape route at all escape routes.

2.2 Communications to fire action

Access roads

Access roads allow access road fire vehicles and emergency vehicles to the property. For objects in inaccessible terrain is not design.

The communication must have a minimum width of 3 meters and extending in a place where there are fire hydrants or other water supply and the load bearing capacity of 80 kN per axle vehicle.

Driveways and crossings for access roads should be wide 3.5 m 4 m high. The radius of the roundabout must be at least 5 m

The raft areas

Each access road leading to the assembly area from which the action is carried out of the building by fire mobile devices. The attack surface shall have a minimum width of 3.5 to 6.5 meters, must be sloped, drained and compacted to a minimum load of 80 kN. Area should be placed along the longest façade of the building or perpendicular to it, so that when hit by a vehicle fire extension ladder or lifting platform can be reach at least 50% of the affected building.

Internal and external access routes

With internal access routes that allow fire protection units hit the inside the building should be considered in facilities in which a high risk of fire in buildings with a height of more than 22.5 m buildings that do not have holes in the exterior walls.

The single-storey buildings can result in internal emergency road communications in which people can be threatened by the effects of heat, smoke or falling parts of building structures. On these roads follow other passages, paths or ladders leading to the fire compartment.

This communication may not be set up in buildings protected by fire extinguishing equipment.

External access routes are fire ladders, fire stairs and benches. Fire ladders to handle objects having an area greater than 200 m² and a height of 9 m. Fire platforms with handrails are used to overcome obstacles over the roof.

2.3 Fire extinguishers

Prepare for a possible first aid - Distribute fire extinguishers and keep them in a functional condition. Fire extinguishers of all types and for all types of fires, deliver, install and carry out their regular inspection.

Fixed fire fighting water-based are the most common sustained fire equipment. Water still remains the most important and most widely used extinguishing agent - it is cheap, adequate quantities are available, easy to draw, and the environment is not a danger. Fire effect of water based on its ability to absorb heat.

Sprinkler SHZ

Sprinkler fixed fire extinguishing equipment is automatic device that is activated by temperature. Sprinkler head towards achieving the opening temperature of the thermal fuse (about 30 ° C above the maximum operating ambient temperature) is automatically opened, leading to a drop in pressure in the pipes, the subsequent opening of the control valve and run the sprinkler extinguishing system. After opening the sprinkler head discharge occurs in the form of water spray jet. Open only sprinkler heads that are the focus of the fire or in its vicinity, it is only those whose function it is necessary to fight fire.

Wet sprinkler system is the most widely used sprinkler system with a wide range of uses for the protection of warehouses, office space, industrial and commercial buildings and wherever the proposed system is not threatened by frost. Wet system ensures reliable operation, long service life and extremely easy maintenance.

Dry sprinkler system is applied to the environmental risk frost, such unheated storage areas, loading docks, public garages and the like. Pipe system from the control valve - in contrast to the wet - filled with compressed air.

SHZ Gas

Fire-sensitive or valuable equipment, devices electrically live special risks and require special attention. Gas extinguishing systems are the best choice for protection of computer room, servers, telecommunications equipment, control centers, electrical switchboards, but also to protect the paint booths, turbines, archives, museums and the like.

By fire is detected at an early stage of development and extinguishing agent is released in a few seconds the damages are minimal. A necessary condition for effective protection solutions is the right choice, the responsible design and installation, it is the optimal choice of gas, achieving correct extinguishing concentration and maintain it during the time.

Extinguishing Foam

Foam consists of water, foaming concentrate and air. The amount of air in the foam formed determines the type of foam (heavy, medium or light foam), oxygen retardant approach.

Foam fire extinguishers are mainly used to protect tanks and storage of flammable liquids, hazardous materials, chemical industry, refineries and the like.

3 AIRPORT FIRE PROTECTION

The airport is geographically defined and appropriately treated area, including a set of structures and equipment designed to continuously start and arriving aircraft and aircraft movements associated with it "

An airport has an awful lot of definitions, depending on what point of view we look at it and how we want to define it exactly as operational, economic and social unit. I chose these three definitions, but I agree with most third definition Aviation Act, which is the definition of a purely operational standpoint, though by fire safety would be complemented by a set of structures related to the operation of the airport, which form the same fire risk places at the airport.

The building that is operating on the airside facilities include:

- Take-off runways,
- Traverse a path-stop,
- Parking areas,
- Building-stop for passengers and cargo (non-public section)

- Storage fuel tanks
- Building an airport providing fire protection (fire station)
- Ensure the protection of the airport building (secure fencing with entry / exit into the guarded area)
- Buildings and facilities providing power distribution,
- Control tower,
- Office buildings and building control center,
- Biological protection areas airport,
- Other warehouses and hangars.

On the other side of the airport are areas that usually do not manage the airport operator, but a commercial partner.

On the landside are:

- Public parks, car parks,
- Building manufacturing and supplying aircraft onboard refreshments
- Buildings used by air carriers
- Catering equipment, hotel services, trade and other commercial spaces of leisure travelers and public sphere.

Multiple uses of today's airport is a major challenge in the field of security assurance. These devices must therefore meet the criteria for an incredibly demanding security, safety, communication and building automation equipment. The safety hazards at the airport include fire, terrorism, smuggling, illegal immigration and theft. They deal with a difficult task because of the need to monitor many different areas: fences, parking structures, terminals and other facilities for passengers, check-in area, the air side, etc.

As in many other areas of life, there is constant progress in relation to the construction, expansion and renovation of airports and their facilities. Because human safety is an absolute priority, the only responsible choice is to use the best and latest technology that is available, and which are ideal requirements for security, safety and communication for airports.

4 ANALYSIS AND DESIGN OF FIRE PROTECTION KOSICE AIRPORT AS A WHOLE

Every airport, from which there are regular flights, must have their fire protection.

Must have built their fire station, its technical resources and trained fire fighters. Each airline before you start to operate at any airport, starts asking questions about the level of fire protection is the airport.

In the case of bad, airline security to avoid such airport security. In the event of an accident can't rely on public fire departments.

At smaller airports can meet fire fighters cumulative function - can perform other tasks-such

loading of goods but in case of fire must be immediately available.

The airport must be equipped with its fire station, which must be positioned so that the fire fighters wherever it came within 3 minutes of being reported and initiated action. For all movement areas must arrive within 2 minutes.

Fire stations should be built as close runway. Exit the VPD should normally cross, without any curves. Vehicles in the fire station to be able to instantly submit full power. This means that it can't wait until the motor will overheat and then based. Engines are maintained in still hot without condition, that is, to be a garage heated to at least 15 ° C and the motors are also heated heating elements to heat the oil or coolant. On exit, this device must be automatically disconnected.

Facilities at the airport fire station depend on what are the natural conditions around the airport.

Desert - tracked vehicles,

The area of large bodies of water - boat

Swamp area - hovercraft.

The current European conditions are used primarily cars. Technology should be of one manufacturer as it simplifies operation, maintenance and repair.

When purchasing techniques in mind, they are around the airport buildings and facilities that are to form an insurmountable obstacle technology / low underpasses /. The car must be kept in mind that they will move in the field = vehicles must be capable of overcoming various obstacles (fences, woods).

4.1 Transformer station

Substation at Kosice airport is a separate two-story brick building with a flat roof.

Airport electricity supply is provided from the public network. To increase the reliability of supply is connected to the airport public network from two independent sources inlets 22 kV peak or high consumption of major airports leads to 100 kV. Turning back-up supply is carried automatic backup. The main substation is positioned so that it can be of direct objects powering some airport nearby. The main transformer is transformed supply voltage from 22/6 kV, which is powered by the main distribution system and airport ancillary substation. These are located near buildings or complex devices, which provide power.

Substation is located outside the built-up area of the airport apron to the north, about 1km in fenced area with permanent service.

The airport is built on its own water supply wells with the underground hydrant system, object (wall) hydrants. This study is also an established system for filling fire engines, where one tank filling time is 15 min. (Which is 533 l / min) and water supply of the city with the underground hydrant system, object (wall) hydrants.

Hydrant for filling of fire with fire stock for LPL is located about 10 meters from the entrance to the

building stock LPL. CAS 32 filling period is about 24 minutes (which is 336 l / min).

Access road, allowing the arrival of fire vehicles to the transformer station on the northern side, is sufficient.

The fire department has the following support structures: brick walls, ceiling structures of iron - concrete panels (meet fire resistance), non-bearing structures: brick walls and the exterior facade of the building is lime plaster and paint.

The zone is not installed fire closures or internal wiring fire water or the amount of water supplied is zero. Building is not equipped with any equipment to evacuate people.

Escape routes

Since it is an intermittent not working and there are still jobs escape routes are designed to be sufficient for occasional short-term occurrence of two employees.

That fire led section 2 unprotected escape. Ventilation is natural escape route by opening windows and doors, lighting is artificial, the prescribed signs in a conspicuous place.

Road width is 1.4 m and the total length of the first floor of the second floor wax 14.3 23 m.

The floor of the escape routes from the concrete stairs and also concrete.

Furnishing fire extinguishers

The facility is located along three fire extinguishers of the powder 1x PG-6 and 2x CO2 S5.

4.2 Hangar

Hangar space serves as a collective garage and parking of aircraft. These areas are on the ground floor and have zero fire height.

The design of these areas consists of steel columns, the vertical structure, the horizontal support system. The roof is made of tin roofing, wooden casing with a thickness of 25 mm, breaking the metal gates and automatic gates sandwich.

Escape routes

In this building is not fire separation design and result of his three escape the period of 28 m and a width of at least 4.5 m. There are no fire stops installed reclosable openings. The escape route is marked by a lighted day and artificial light.

4.3 Offices

They are located on two floors, where the offices are in addition to the restrooms, and cafeteria space cargo.

The fire department has a fire height of 3 m.

The supporting structure of the building is made of brick 150 mm thick and non-bearing structures of baked bricks. Finish building structure is as follows: stucco, ceramic tile, drywall tape, and built-in lighting fixtures.

Escape routes

The office kept two escape routes, one with a length of 27.1 meters and a width of 0.8 second duration 17.2 mA width of 0.8 meters.

As the cargo spaces consist of three parts lead are three escape routes and the length of 9.42 m, 7.4 m and 7 m All widths are 0.8 m.

The areas served by leading an escape route length of 7 m and a width 0.8 m.

All escape routes are well marked in conspicuous places and are illuminated by natural and artificial light.

Doors on escape routes are plastic, glass, wood and iron gates.

The construction zone is not installed fire stops closable openings in fire separating structures. In this section, the internal wiring of the fire water flow rate 3.59 l / s.

4.4 Control tower

The building is the control tower at the airport Kosice airport located outside the building so it was a great view of the entire operational area of the airport. The property was built 21st June 2008 as a modern new with modern facilities. It is enclosed by a fence with a permanent protection, making it completely safe and protected.

The tower has a height of 32 mA control the eyes of 25 m. windows on the building will not open. one entrance and exit through the door is placed to the bottom of the building.

Is it smooth drive way. The escape route is designed as the front door is not a problem, because the tower is still only employee on duty. It is equipped with one fire extinguisher that the resulting potential fire until the arrival of rescue fire service is sufficient and meets all labeling regulations.

If an employee sees a fire must immediately report it to open the door and rescue unit.

5 CONCLUSION

Fire protection of buildings, structures, objects is a very important issue, because fire can carve not only economic loss but also the loss of human life. As the fire wants to avoid any operator of any facility must follow the rules mentioned the Ministry of Interior.

I detail in my work mainly analyzed objects run airport operator. Fire protection every single building is just as important. One is no more movement of people in a dangerous turn, and combustible material, therefore fire in the development plan should be very attentive and meet all required standards for it. Building may have more fire extinguishers, escape or top perfect driveway, fire is still unavoidable. We have a trained staff and so in case of an emergency panic oh curs and our ultimate plan will have to adapt to situations. Yes it is! But using it can at least easier and faster to resist flame of fire.

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