SPECIAL AIRPORT FIRE TRUCKS

Peter Mihok, Peter Koščák
Technical University in Kosice, Faculty of Aeronautics, Rampova 7, 041 21 Kosice, Slovakia
**Corresponding author*: peter.koscak@tuke.sk

Summary: This thesis deals with the specialty of the airport fire vehicles such Sides In 3000 Rosenbauer Panther, which are a major security Article rescue and firefighting services (RFFS) at the airport. The work is divided into three chapters. The first chapter introduces the reader to the RFFS and history from creation through fire station, training, equipment to fire and other substances. The next chapter is the core work and discuss in more details vehicles as their technical and tactical characteristics. Finally, the third chapter analyses the use of the vehicle types to individual airports under fire division categories

Keywords: Rescue and firefighting services, special of the airport fire vehicles, categories airports.

1. INTRODUCTION

Security and continuity of airport operations, the main task of rescue and firefighting services at the airport. Resolution as problems during landing an aircraft landing gear, engines, or other indicators of security threats, the main task of rescue and firefighting services. Furthermore, this assistance during the refuelling of aircraft on airfields, as well as the removal of the aircraft incapable of movement or damage caused by spilled fuel. Fire in the object of airport is another threat, for which eliminating is responsible the emergency fire service of the airport. In this and many other crises are fully usable special airport fire trucks. Each airport is specific to their operation and capacity of aircraft movements, passengers handled, or transported tons of cargo. On this basis, the airport security requirements set by rescue and firefighting services must meet. The increase in passengers carried in air transport in recent years caused the increased demands for ensuring the safety of airport operations. Accordingly, it is presently allocated to each airport fire rating and is intended characteristics of fire rescue vehicles, their capacity, speed, performance, technical and tactical requirements.

2. RESCUE AND FIREFIGHTING SERVICES

The first mention of organizational units intended for firefighting come to the times of ancient Rome. Then were constituted for the city station with a crew of up to 500 slaves, which interfered with the fires of the city. The fires were at that time very common, as many patricians earned on that were opposed to quickly and cheaply. The houses were usually wooden ceilings, floors and furniture, and were up 5 floors high. Has been reported when only water (pumped from the fountains, wells and rivers) and dampers, which oppressed fire. In addition to forest fire fighting exercise "prefecture" and educational activities (secure homes against fire) and intervene as police today in mass riots and crimes. After the demise of ancient Rome was organized firefighting forgotten and passed to the obligation of all citizens of the city. Cities could govern themselves regarding the fire protection. In most places had homeowners equipped the buildings. Fire brigades, but only voluntary or general, in Hungary were established in the 18th century. Followed up by the laws of Emperor Joseph II., who in 1788 issued the first fire order. In 1888 it was put in force regulation according to which should be in all municipalities with over 50 farmhouses established firehouse.

2.1 Activities and tasks

Procedure for rescue work depends on the situation as it is after arriving at the crash site. Performance rescue and provide assistance when life is at risk, human health and the environment is also of paramount RFFS. It requires but a need for specific training and readiness and equipment. The most dangerous moment of the action starts at the airport, aircraft landing and handling of aviation fuel. Daily the aircraft pumped tons of fuel, when passengers are on board an aircraft is required to be present at RFFS this operation incurred due to various situations such as:

• Environmental disasters,
• The outbreak of fuel respectively, Ignition.

The main tasks can include the following, namely:

1. Deliverance and saving people during natural disasters, fires, traffic accidents, accidents, air disasters and in other emergencies.
2. Rescuing people from heights and hardly accessible terrains using climbing, speleological, special air or special equipment.
3. Deliverance of people from caving and confined spaces with special equipment used in saving.
4. Provide pre-medical assistance to the affected person in the intervention and rapid transport to the hospital by rescue specially modified vehicles.
5. Performance of interventions in accident with hazardous substances under its hardware.
6. Provide assistance in carrying out fire risk activities.
7. Is a specially trained personnel, who knows to interfere in any conditions and quality of interference corresponding to periodic inspections and tests.

2.2 Fire station at the airport

Location of the fire station at the airport is of great importance failure timeout for intervention. Any other criterion which would affect the position of the fire station to the other object is secondary. In order to limit the time a via fulfilled, it is necessary at some airports with a large railway systems build more fire stations. Each of them should be placed as close as possible to the instrument runway where there is the most common accidents. If the airport is built more fire stations, one of them is designated as the principal and others are referred to as auxiliary - satellite. Each station is arranged with one or more fire trucks. The total quantity of extinguishing agent is distributed so that was enough for the first intervention. Other firefighting vehicles must arrive by 1 minute after the first vehicle at the accident. When considering the location of the new station shall be taken into consideration further development of the airport, especially runways.

From the station exit must be smooth if possible without unnecessary corners to hold up an effective intervention of fire vehicles. In the past the fire station at the airport suggested very economically with minimal space for crews stay. Research has shown that the basis for successful intervention, as well as the hardware is the mental and physical well-being of the fire personnel.

Fire fighters and their training

Employees and their training depends on what types of fire vehicles are used at the airport and maximum extinguishing agent for which the vehicles are destined. To determine the number of firefighters is necessary to take into account the type and number of planes run on airfields. Staff RFFS and special firefighters - rescuers must undergo training and participate in periodic background checks whether physical, psychological as well as a theoretical test. Firefighting vehicle driver must be well trained to drive a vehicle in different kinds of terrain surface. The staffs are trained so that the intervention can work independently without the instructions of the Head intervention. Critical situation requires each firefighter to know at the moment to decide and take responsibility for the decision.

Training of fire fighters is divided on two categories such as:

• Category 1 - practicing skills using firefighting equipment and armament advise as basic training.
• Category 2 - operational exercises extinguishing fires and different equipment and different types of rescue. The training program must ensure that all members of the intervention unit were convinced that they are able to handle the situation and related equipment.

2.3 Extinguishing agents

Firefighters during the performance of the rescue could extinguish the resulting fire just enough water. Some fires are prohibited extinguish with water because the consequences could lead to even greater disasters. For each type of fire extinguishing are used other substances which are also categorized. At the airport, must be available main extinguishing agents for extinguishing and also additional.

Into two basic categories are divided as follows:

The main extinguishing agents.

- Foam Class A.
- Foam Class B.
- Combination foam A and B.

Complementary extinguishing agents.

- Carbon dioxide - CO2 .: called snow,
- Dry chemical powder,
- halogenated hydrocarbons,
- combination of substances A, B, C and D.

The level of fire protection is provided in the ASM (Airport Services Manual) and Aviation Regulation 14 airports. Important is the arrival time, speed and efficiency of intervention. Limit a via time anywhere the accident occurred, including clearway shall RFFS arrive and begin rescue operations within 3 minutes from the decommissioning of the fire station.

If the accident occurred on the airport movement area with good visibility, the time limit shall be reduced by one minute and the range is set at 2 minutes. Verification time says that within 1 minute after the initiation of fire suppression must be disposed more than 90% of the range of fire. The airport fire trucks will be allowed one minute to travel from the place of fire station from the alarm and within three minutes be in any place-most point of the airport. But time is not limited because it is the time from the initiation of fire suppression to its full completion to be as short as possible.

It seems that the intervention limits are strict, but these times are based on the actual conditions of the statistics of accidents and fires at the airport. FAA in 1980 did test the effect of fire on wide-body aircraft. From the test, it was found that for aircraft seats which are not of combustible material or are coated with a non-combustible material to prevent the spread of fire, after 120 seconds into the fire rapidly decreases the chances of saving those who survived the first few seconds of the accident.

3. SPECIAL AIRPORT FIRE FIGHTING VEHICLES

Rescue staff and firefighting services for their performance during the rescue operation not only need good training and the ability to use special tools, but also need to have a special technique by which they can in the shortest time arrive at their accrued incident or disaster. Extinguishing burning fuselage, or fire inside the fuselage is a matter which requires a high level of security to prevent injury or death of people. Extinguishing huge areas smouldering fire calls have large capacity tank with water and extinguishing agent. Rescue of the fuselage, during combustion, is not safe for either side. Forced opening of the aircraft and a barrage of oxygen can cause even more ignition of fire and much more jeopardize the situation, possibly saving action. For these and similar situations, is the use of airport Specials type (ARFF - Attribute - relation File Format).

Sides S 3000

This special type is from France, a technique used by firefighters at airports. Emergency Special labelled Sides S3000 has in its fleet fire department of Kosice airport. Models VMA 90 and 98. The configuration is 8000 litres of water, 1,000 l of foam and roof monitor the discharge rate 4500 l / min.

S3000 is designed for Category 5 to 10 ICAO at airports, it differs from its predecessor about in all directions. His designs are standard today to speak about airport specials. Aerodynamic body does not affect the rapid and safe driving of the vehicle that must navigate the airport, great

acceleration and also relatively high speed. The chassis of the vehicle must be equipped with a sufficiently powerful aggregate, which is located at the rear of the vehicle. These special engine power range from 500 hp and more. The most powerful engine used in the latest type S 3000 Mercedes-Benz engine with an output power of about 800 hp. It may be shouldering more engine variants, such as Renault or Iveco diesel engines.

Sides S3000 is manufactured according to ISO 9001 in two categories, the first is so basic, light, the chassis of the vehicle is in 4x4 format can also be in 6x6 format. The second category is called severe, extra heavy, which is exclusively in the design of six-wheeled vehicle, ie 6x6. Suspensions are used by Thomas or MAN. According to the different variants of the tank extinguishing agent. Thin bears from 4 000 litres up to 5800 litres of water. Severe version of this type from 6,500 litre to 9,600 litres of water, no extra severe and last from 11,250 to 14,000 litres of water no maximum limit is 16 000 litres of water. The latest model VMA 105, a water tank with a volume 9150 l foaming carries 1350 litres of water and also 250 kg extinguishing powder. Driven by the Reanult engine on the performance of 520 horsepower which allows accelerating from 0 to 80 km / h for 28-32 s. Vehicle width is 2870 mm, and is made even smaller variant of 2500 mm.

Rosenbauer Panther

Panther is ready to serve the airport fire departments around the world. This type of ARFF is innovative and professional vehicle chassis and fire protection systems are fully integrated, designed and manufactured by the Austrian company Rosenbauer. They are produced in formats 2, 3, and 4-axle chassis with all-wheel drive. Engines Performances 500-1260 horsepower. The tanks are on the volume of 5000 to 19,000 litres. The company offers the perfect blend, and chassis, trucks and fire equipment is connected to a power source and ensures a long product support. All components are fully integrated system developed "state-of-the-art" CAN Bus which is the automatic control.

The front of the cab obscures the real design enjoyment. On the roof there is Rosenbaur Monitor RM 60 C with a flow of 5000 l / min., the clear cover, lighthouses blue and speaker. Inside there is enough space for crew which can be composed of 3 firefighters and 1 machine head. Monitor Control is fully adapted to the driver. Breathing apparatus from Scott are integrated into the seats and the left side of the seats are a pair of spare oxygen cylinder. Between the seats is a transition to the roof of the vehicle. The front of the outside, the glass is placed second monitor so buffer, two roof over this less powerful and this model RM 15 C with a flow of 1500 l / min. the Panther ARFF over other vehicles in that it is mounted on the side and back of the extension ladders. The cabin of the vehicle is dominated except the windscreen headlights and lower blue lights, also massive mirrors, allowing the driver to keep track of the situation behind the vehicle. The shape of fire trucks smoothly follows the cabin, for it is a pair of roller shutter boxes. From the left is access to the pump if the powder sprinkler, hose B and C. From the right side there is also a powder extinguishing system with the intensity of 2.5s. 5 kg / min., The hose fitting B and C. For a pair of roller blinds are the sides of the tailgate, as we find them hidden reel with 40 m hose DN 32, to which is attached a highly effective and easy to handle nozzle NEPIRO Ergo, the maximum possible flow 475 l / min., the construction of an oil damper in the closing valve reduces the pressure surges in the hoses.

3.1 Compare vehicles

Sides are suitable for airports with less traffic to medium, where the parameters are sufficient for the type of aircraft and fire protection. It has excellent handling characteristics as evidenced by the modern gearbox with six gears. Acceleration lags only 0.2 s. by Panther. As one of these specials it is possible to get even in 4x4 formats. The technical and tactical characteristics are very good. The interior is clear but a bit complicated control equipment unlike Panther that it is all on one big screen.

Benefits:

- price,
- reliability,
- excellent transmission,
- easy negotiation rough terrain.

Cons:

- cheaper materials,

- lower performance vehicles,
- less electronics.

Sides, suitable for airports such as Poprad and Kosice where traffic is not as challenging for their skills and team meets all requirements for airport security fire category. The price of the vehicle is a further advantage.

Panther at first glance looks very robust, as evidenced by its characteristics and parameters. It is made of high performance which ensures excellent acceleration and knocked into place. Perfect consistency controls from a single power source. Unlike its colleague Sides, is easy to use nozzles of the car and all the venom large clear display. In addition, on the roof is the speaker through which the incident commander warns or give instructions to firefighters during an intervention. The entrance door is fully opened so that the lift automatically. Another positive aspect is the rapid transgression of the cab roof with the help of steps leading from the back of the cab.

Benefits:

- performance,
- can Bus system,
- speaker,
- simplicity,
- design,
- used robust materials.

Cons:

- price,
- futility use the below categories airports.

Panther is suitable for airports with higher category of firefighting. Is used in the major European airports such as Charles de Gaulle Airport or Heathrow. Bratislava Airport has owned one.

4 CONCLUSION

The main aim of my thesis was an analysis of firefighting airport vehicles Sides In 3000 the French company and the Austrian company Rosenbauer Panther. At work I focused on these specials fire not only in technical terms but also in terms of the use of domestic and international airports.

The introductory part of the thesis is devoted to the characterization rescue and firefighting service and from inception to the present. Briefly and in general are described ZHS activities, organizational structure, fire station, fire fighters and their training so that the readers obtain basic information on rescue and firefighting service. Helping the information on techniques and equipment utilized by the fire fighters at the airport and also a very important element and extinguishing agents, their distribution and determination. The chapter is ending by subchapter concerning time limits that are just as important for both firefighters firefighting vehicles which compliance must not be neglected.

The core of the work is targeted at the vehicle Sides and Panther. Analysis of these specials I found that even though the vehicles comply with the requirements of almost the same, each has its special use at an airport. Sides are suitable for smaller airports as regional or international, less traffic and therefore less fire category. Its excellent features and low price compared to Panther will be ideal for smaller airports. Panther is suitable and also used at major airports with more traffic and high fire category. It is made of quality materials and thus has excellent technical characteristics which enable it to serve at airports such as Charles de Gaulle Airport or Heathrow. The price, however, exceeds one million euros and thus is more than three times the fire specially Sides.

The work concludes analysis of fire categories selected airports and various airport to fire classification category from lowest to highest. I started up the second category as the first fire in Slovakia has no small airport. The task of this chapter was to prove that the fire specials such as Panther are used effectively to the major airports. In the analysis I've also found that certain Slovak airports carry the fire station and vehicles that only through their regular maintenance comply with the limits and requirements of fire category and is only a matter of time before these vehicles will end his life, therefore, should have as its objective the airport and the obligation to exchange for new vehicles, because safety is one of the most important parts of the airport.

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