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EMERGENCY RESPONSE AT LANDING AIRCRAFT

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In order to prevent and eliminate the accidents that occur during emergency situations with a deviation from the norm (Fig. 1), it is vital to quickly eliminate the risk of fire and to ensure human safety and environmental safety area in the process of emergency operating.

Currently the most reliable method implemented is covering runway surface with the using of fire foam layer to reduce the degree of aircraft structural damage during landing and to reduce the likelihood of fuel system units failure.

Figure 1 – A passanger jet made an emergency landing on a protective layer of foam

In recent years, a number of airlines and airports have contacted Airport Technology concerning the procedures for the application of aircraft rescue and fire fighting foam onto runways for various types of aircraft experiencing unsafe landing gear indications. A foam path is the aviation safety practice of spreading fire suppression foam layer on the airport runway prior to an emergency landing (Fig. 2).

Figure 2 – Spreading of fire suppression foam layer on the airport runway

Originally, it was thought this would prevent fires, but the practice is now discouraged. The U.S. Federal Aviation Administration (FAA) recommended foam paths for emergency landings beginning in 1966, but withdrew that recommendation in 1987, although it did not bar its use. In 2002, a circular recommended against using pre-foaming except in

certain circumstances. In particular, the FAA was concerned that pre-foaming would deplete firefighting foam supplies in the event they were needed to respond to a fire.

Also, foam on the runway may decrease the effectiveness of the landing airplane's brakes, possibly leading to it overshooting the runway. Foam is still used in aviation firefighting, usually in conjunction with Purple-K dry chemical.

Due to this disadvantage we propose to use polymer foam, which is produced on the technical base of sorbent Unipolimer-M. This layer is intended to amortizate dynamic shock and absorb energy for emergency response at landing aircraft. What is more, we developed a method for its use.

There are several fundamental benefits of using this material: flammable, energy-absorbing construction of aircraft, high oil capacity, eco-friendly and easy to manufacture.

Foam generating unit PGU-M spreads polymer self fusing foam on the runway. Installation includes tanks with emulsion, hardener, pumps, dispensers of piping systems and temperature control units to optimize the components measuring instruments with valves and equipment.

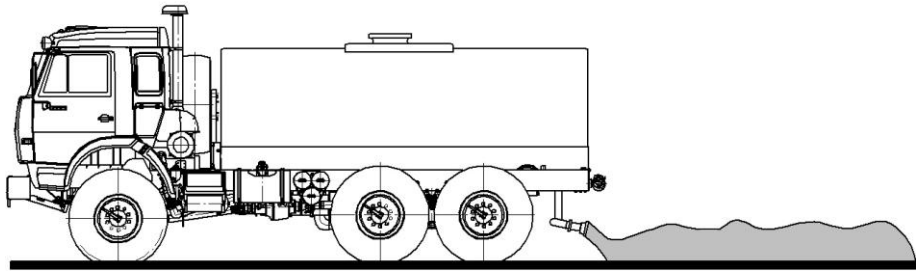

Figure 3 – Foam generating unit PGU-M spreads polimer fireproof material

Amortization of transient dynamic forces is illustrated by the specific example (Fig. 4), which however, is not only possible, but it can clearly demonstrate the possibility of achieving essential characteristics of the technical result.

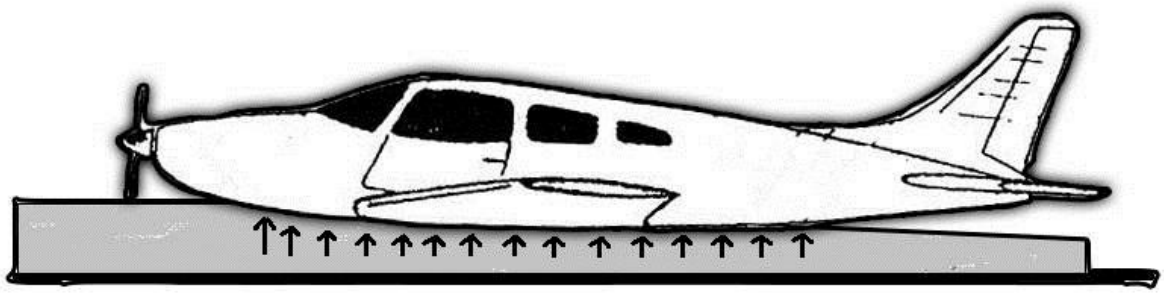

Figure 4 - Scheme of aircraft emergency landing on a polymer mat

This technology is the subject of know-how and is currently being patented.

Thus, the developed technology will allow to prevent emergency aircraft landings, risk of fire, environment pollution and to ensure safety of aircraft construction, crew and passengers.

References

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