

Civil Aviation Accidents of the Small Aircrafts within the Czech Republic

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Abstract

Air transport is proclaimed to be the safest of all means of transport. However, even the safest system might fail and therefore various incidents and accidents occur in the aviation. The aim of the paper is to analyze number of aviation incidents and accidents especially of the small aircrafts in the area of the Czech Republic in last few years. Statistics shows the number of accidents according to the type of aircraft and also the number of fatalities.

KEY WORDS: *air transport, aviation accident, small aircraft*

1. Introduction

Aviation safety is defined as a state in which the possibility of harm to persons or of property damage is reduced to, and maintained at or below, an acceptable level. Maintaining of the acceptable level of safety is ensured by a continuing process of hazard identification and safety risk management and it is a top priority goal in the aviation all over the world. [1]

The basic indicator for measuring the level of aviation safety is the long-term development of number of accidents or incidents. [2] The achieved level of aviation safety also determines the quality of aviation. [3] However, measuring of the level of safety is difficult and sometimes impossible task because safety is measurable more because of its absence rather than its presence. [4]

2. Emergencies in aviation

Different types of emergencies arise in aviation which might be classified according to the severity of its consequences.

Accident is the most serious event that may occur and it is defined as an occurrence associated with the operation of an aircraft which takes place during time period when any person boards the plane with the intention of flight until such time as all such persons have get off the plane, in which:

- a person is fatally or seriously injured, or
- the aircraft sustains damage or structural failure, or
- the aircraft is missing or is completely inaccessible. [5]

Serious incident is less serious type of emergency which involves circumstances that an accident nearly occurred, for example engine failure, fire, terrain and obstacle clearance incidents, flight control and stability problems, take-off and landing incidents, flight crew incapacitation, decompression, near collisions and other hazardous air traffic incidents including faulty procedures or equipment failures. [6]

Incident is the least serious type of emergency, and it is defined as an occurrence other than accident, which is associated with the operation of an aircraft which affects or could affect the safety. [6]

3. Aviation incidents and accidents

The paper focuses especially on accidents of the small aircrafts with maximum takeoff mass not exceeding 5 700 kg because it accounts for up to a third of the total number of aviation accidents. The maximum takeoff mass (MTOM) of an aircraft is a maximum mass at which the aircraft is certified for take-off due to structural or other limits. It is a fixed value which doesn't vary with changes in temperature, altitude or runway available. [7]

As mentioned above, the basic indicator to measure safety is the long-term development of the number of aviation accidents and incidents. Number of emergency occurrences varies every year and the development in last ten years is shown in Figure 1. [2]

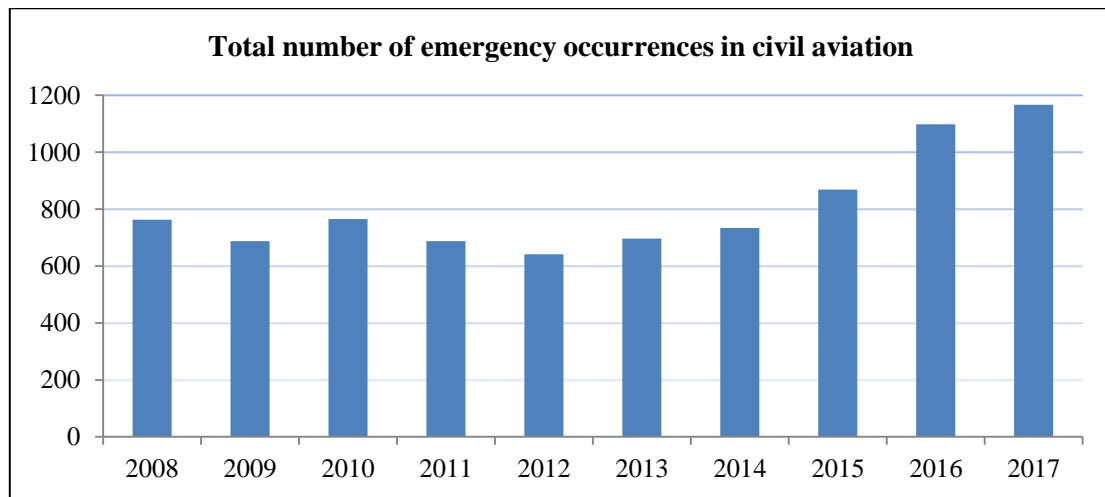


Fig. 1 Total number of emergency occurrences in civil aviation

Number of occurrences varies every year as it is described in Figure 1. Although there is the most emergency occurrences in 2017, this year was evaluated as highly successful and the safest period in the history of aviation. The number of reported occurrences in last years was rising also due to growth of the total volume of air transport and due to more stringent classification and reporting of emergencies.

Figure 1 described number of emergency occurrences in civil aviation all over the world in last ten years when data were available. On the other hand Table 1 mentioned below shows number of emergencies that happened only in the territory of the Czech Republic. [2]

Table 1

Table 1 Civil aviation accidents in the territory of the Czech Republic

Category / Year	2017	2016	2015	2014
Aircraft Category (MTOW)				
Over 5 700 kg	0	0	0	0
From 2 251 to 5 700 kg	0	0	0	0
2 250 kg and less	1	2	2	2
Total	1	2	2	2
Operation of aircraft				
Aeroplanes	11	7	4	77
Helicopters	3	2	3	10
Gliders	18	10	12	16
Balloons	0	0	1	3
Unmanned aircrafts	4	7	1	0
Total aircraft	36	26	21	106
Operation of sport flying devices				
Aeroplanes	22	13	19	20
Helicopters and Gyroplanes	1	3	1	2
Gliders	0	1	0	0
Para Gliders	7	7	8	0
Motorized Para Gliders	4	6	4	0
Hang Gliders	1	1	3	0
Motorized Hang Gliders	1	2	1	1
Total Sport Flying Equipment	36	33	36	23
Parachute Operation				
Sport and tandem parachutes	20	18	22	88
Total of all categories of civil aviation accidents in the territory of the Czech Republic	92	77	79	217

Table 1 shows number of aviation accidents in the territory of the Czech Republic in last years. The positive fact is that there were no accidents of motor-powered aircrafts operated in commercial air transport. In the aircraft category from 2 251 to 5 700 kg no accidents occurred as well. Only seven accidents of aircrafts up to 2250 MTOW were recorded.

Number of accidents of the aircrafts and flying devices is shown separately for each category of aircraft or the flying device. Table shows that there is much more occurrences of accidents in those categories that accidents of aircrafts from 2 251 MTOW.

4. Fatalities of aviation incidents and accidents

As a victim of aviation accident might be understood a person who was severely injured as a result of presence on the aircraft or direct contact with any part of the aircraft, including parts that separated from the aircraft or by direct action of the gas stream generated by the aircraft. [5]

Number of all fatalities of aviation accidents recorded in the territory of the Czech Republic in examined period of time is shown in Table 2. [2]

Table 2

Table 2 Number of fatalities of aviation accidents in the territory of the Czech Republic

Aircraft Category (MTOW)	2017	2016	2015	2014
Over 5 700 kg	0	0	0	0
From 2 251 to 5 700 kg	0	0	0	0
2 250 kg and less	1	2	2	3
Total	1	2	2	3
Operation of sport flying devices				
Aeroplanes	1	6	1	8
Gliders	0	0	0	0
Helicopters and Gyroplanes	1	0	0	0
Motorized / Para Gliders	1	2	1	3
Motorized / Hang Gliders	1	0	0	1
Total	4	8	2	12
Parachuting	4	1	4	3
Total of fatalities	9	11	8	18

Table 2 follows the previous table and shows how many people in each category were killed during the accident or with direct relation to an accident. Number of fatalities varies every year and with the category of aircraft or flying device, but the most fatalities comes from the accidents of the aeroplanes. The less fatalities comes from gliders accidents which is quite surprising, especially if its take into account that there were more than fifty accidents in this category.

The conclusions of The Air Accidents Investigation Institute shows, that in majority of cases human factor might be associated with human factor failure and adverse consequences of pilot error caused due to lack of skills and experience. Another cause of much of the accidents is damage of aircraft that occurred during take-off or landing (as a result of aircraft pilot failures), technical failure and lack of pilot experience in crisis situations. [2]

5. Conclusions

The aim of the paper was to discover the level of safety of air transport in the Czech Republic. The level of air transport safety might be measured by the number of emergencies, so the number of aviation accidents was analyzed in various categories of aircraft and sport flying device. Number of fatalities of aviation accidents was also mentioned in the paper to show the negative consequences of accidents. As the most common causes of aviation accidents have been identified the pilot error due to lack of skills and experience and the malfunction of the aircraft or its part.

The positive fact is that there were no accidents of motor-powered aircrafts operated in commercial air transport in the area of the Czech Republic in examined period of time. On the other hand pretty lot accidents of the small aircrafts and sport flying devices occurred with some fatalities.

Acknowledgements

The work was created in connection with the scientific research project of the University of Pardubice no. SGS_2019_010. The authors are grateful for their support.

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