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Agnieszka FORTOŃSKA¹

**INCHES FROM A PLANE CRASH: TERMINOLOGY, CAUSES,
INVESTIGATIVE ACTIVITIES AND RESPONSIBILITY**

Summary. The author of this article will discuss issues related to aircraft accidents. The paper will set out the investigative activities carried out by Poland's State Commission on Aircraft Accidents Investigation. The author will also address the concept of liability for aircraft accidents. The paper will be concluded with comments on aviation accidents.

Keywords: aircraft accidents; plane crash; aircraft accident investigation commission; aviation law

1. INTRODUCTION AND TERMINOLOGY

“The only complete catastrophe is the catastrophe from which we learn nothing.”
William Ernest Hocking

It is generally observed that the media and ordinary citizens tend to refer to a fatal accident involving a passenger plane as “a plane crash”. However, this is a colloquial term, which is absent from any official document. Annex 13 to the Convention on International Civil Aviation introduces concepts such as “accident”, “incident” and “serious incident”. According to this document, an aircraft accident is “an occurrence associated with the operation of

¹ Faculty of Law and Administration, University of Silesia, Bankowa 11b Street, 40-001 Katowice, Poland.
E-mail: afortonska@gmail.com.

an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked” [1].

In addition, Annex 13 regulates the definition of the term “serious incident” as “an incident involving circumstances indicating that an accident nearly occurred”. An aircraft accident and a serious incident differ only in terms of consequences. Another term included in Annex 13 is “incident”, which is “an occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation” [2]. Polish law uses the same terminology as can be found in international legislation and divides air occurrences into: (i) accidents, (ii) incidents, (iii) serious incidents and (v) other occurrences referred to in Article 135(a) of the Polish Aviation Law Act [3,4].

In addition to the above-mentioned act, the terms “accident” and “incident” are contained in the Regulation of the Minister of Transport of 18 January 2007 concerning accidents and incidents. The regulation stipulates the system for reporting occurrences in civil aviation [5]. Furthermore, the EU enacted Regulation (EU) No. 996/2010 of the European Parliament and of the Council of 20 October 2010 concerning the investigation and prevention of accidents and incidents in civil aviation, in turn repealing Directive 94/56/EC [6]. The aim of the regulation is to ensure the safety of civil aviation and to take actions that will reduce the number of aviation occurrences. As with Annex 13 to the Chicago Convention, the regulation specifies that the investigation of accidents and serious incidents has to be carried out under the responsibility of the state where the accident or serious incident occurs, or the state of registry when the location of the accident or serious incident cannot definitely be established as being in the territory of any state.

2. AIRLINE ACCIDENT STATISTICS

Although aircraft accidents involving civil aircraft continually take place, this means of transport is still safe and ranks as one of the most popular travel modes chosen by passengers.

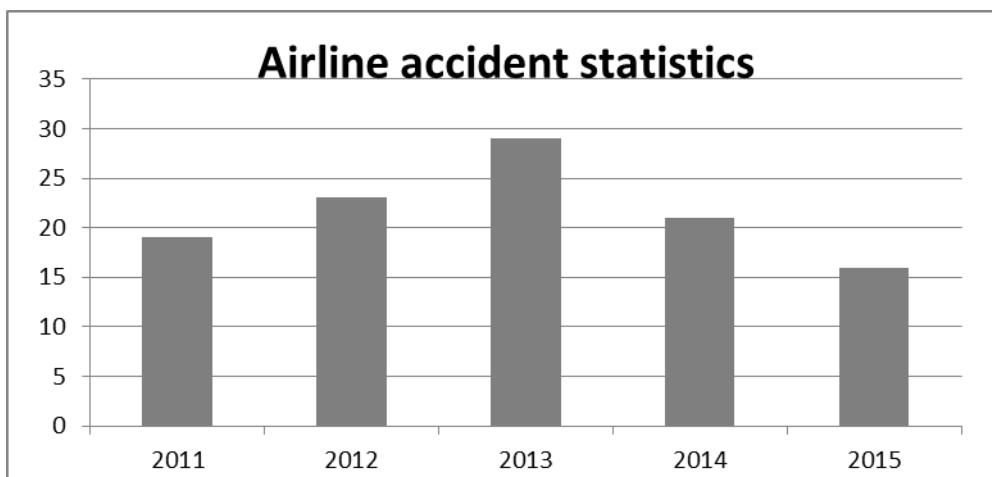


Fig. 1. Airline accident statistics 2011-2015

Source: own elaboration on the basis of statistics from <https://aviation-safety.net/statistics/>

Unfortunately, when considering the available statistics on the number of people who died during travel, 2014 was one of the most tragic years for civil aviation. The impact of these statistics was mainly influenced mainly by four aircraft catastrophes involving passenger aircraft, namely: Malaysia Airlines Flight 370, 8 March 2014 (239 people); Malaysia Airlines Flight 17, 17 July 2014 (298 people); Air Algerie Flight 5017, 24 July 2014 (116 people); and Indonesia AirAsia Flight 8501, 28 December 2014 (162 people) [7].

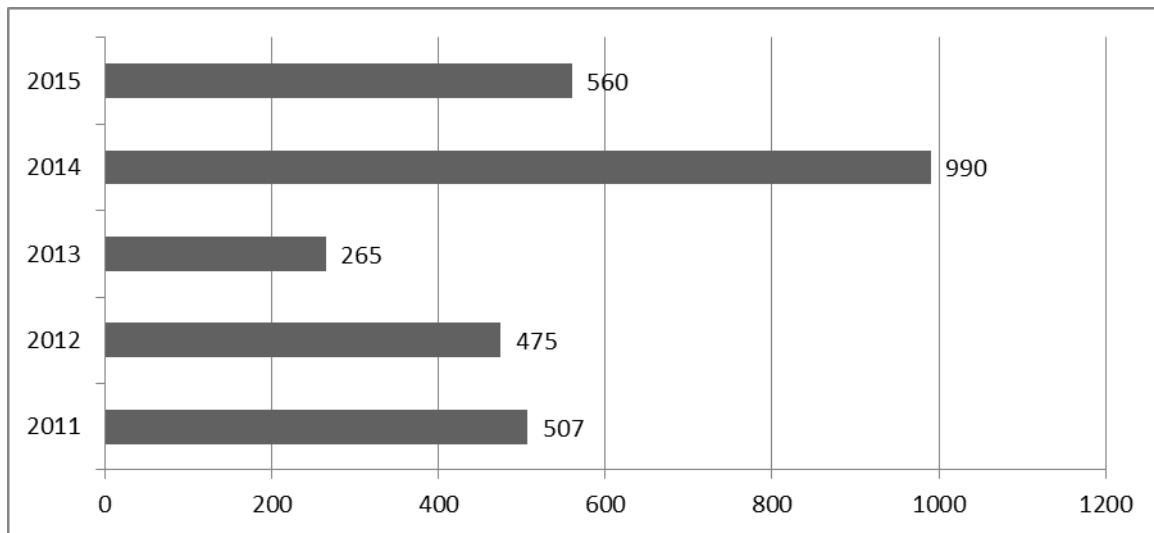


Fig. 2. Statistics of airline accidents fatalities

Source: own elaboration on the basis of statistics from <https://aviation-safety.net/statistics/>

Given all the aircraft catastrophes that have taken place in the history of civil aviation, it is necessary to emphasize that aircraft accidents can take place at any stage of a flight, e.g., during take-off, ascending, flying, approaching for landing or landing. Considering this summary, it is important to note that the most dangerous stage is the flight and approach for landing [8].

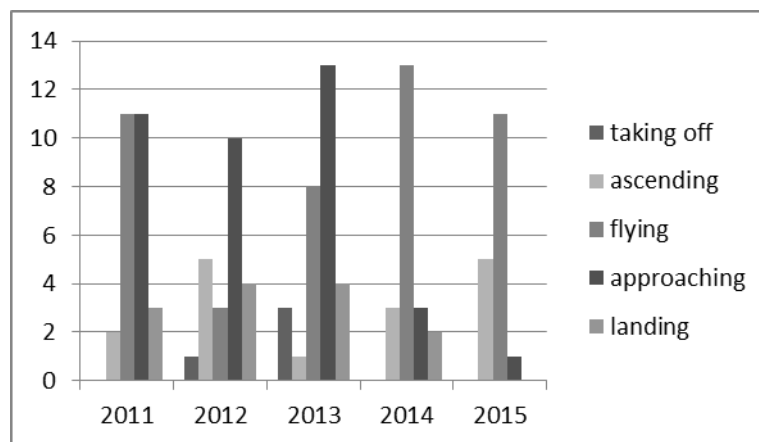


Fig. 3. Airline accident statistics: phase of flight

Source: own elaboration on the basis of statistics from <https://aviation-safety.net/statistics/>

3. CAUSES OF AIRCRAFT ACCIDENTS

An aircraft accident can take place at any stage of a flight. Sometimes, there is only one cause, whereas, on another occasion, it could involve a series of errors, breakdowns or malfunctions of the aircraft. There is no rule regarding this. Furthermore, there are situations when even experts examining an aircraft accident are not able to determine its cause due to the lack of conclusive evidence in the form of black boxes, which recorded discussions with flight and air traffic personnel and flight parameters. Nevertheless, the most frequent cause of events involving aircraft is human error (pilot error, controller error, ground handling error).

Moreover, other causes of aircraft accidents include weather conditions, technical aspects (breakdown, malfunction, aircraft design flaw), terrorist attacks, sabotage, being shot down, communication error, aircraft icing, collision with birds and collision between aircraft.

In national legislation, on the basis of Regulation No. 14 of the President of the Civil Aviation Authority, dated 14 December 2006, the cause groups of the accident were identified thus:

- human factor (refers only to flying personnel)
- technical factor (refers to the systems of the aircraft concerned)
- environmental factor (refers to the environment in which the flight takes place and to infrastructure facilities that provide security)
- organizational factor (associated with flight safety management systems) [9-12]

4. OCCURRENCE REPORTING: INVESTIGATIVE ACTIVITIES OF THE STATE COMMISSION ON AIRCRAFT ACCIDENTS INVESTIGATION - RECOMMENDATIONS AND REPORTS

With regard to the statistics presented above, it should be noted that, despite the fact that aeroplanes, as modes of transportation, display a high safety level, air accidents still occur. In the event of an aircraft occurrence, the first step is to report this no later than 72 hours after it occurred (using any available means of communication) [13]. In addition, it is necessary to send a form with the occurrence data. According to Article 135 (a) Item 1 of the Polish Aviation Law Act, a group of people obliged to report such an occurrence includes, among others, an aircraft operator or pilot-in-command, air navigation service providers and airport managers. In Poland, accident and incident investigations are handled by the State Commission on Aircraft Accidents Investigation (PKBWL), which is a permanent and independent agency [14]. Furthermore, there is also the Polish Committee for Investigation of National Aviation Accidents (KBWLLP), whose task is determining the causes of accidents in state aviation (Article 140 of the Polish Aviation Law Act) [15]. The above-mentioned committees may cooperate based on the Regulation of the Minister of National Defence and the Minister of Transport, Construction and Maritime Economy of 29 January 2013 [16].

After the occurrence has been reported, the next step is for the chairman of the commission to categorize it as either an accident, incident, serious incident or another occurrence as referred to in Article 135(a) of the Polish Aviation Law Act. It should be emphasized that the commission investigates air occurrences in the order in which they took place. It is possible to make an exception to this rule based on a decision made by the chairman of the commission to change the order due to the occurrence gravity (Section 13 of the Regulation of the Minister of Transport of 18 January 2007) [17].

The commission then starts its investigation. According to Annex 13 to the Convention on International Civil Aviation, an accident investigation is a process conducted for the purpose of accident prevention, which includes gathering and analysing information, reaching conclusions, including the determination of causes, and, when appropriate, making safety recommendations. On the other hand, Section 14 of the Regulation of the Minister of Transport sets out the scope of the commission's tasks. These include the collection, registration and analysis of all relevant materials, the collection of medical materials, and the preparation of a preliminary and final report.

In addition, the investigator-in-charge is obliged to notify the police or the prosecutor's office of the commencement of the investigation, if such authorities have already started relevant proceedings. Following its investigative work, the commission compiles a final report, which should be prepared as soon as possible (ideally within 12 months of the occurrence). It is crucial to emphasize that the commission only examines the cause of an accident or incident, as well as prepares recommendations and conclusions. It is not its duty to apportion blame or liability to any specific individuals or entities. This is handled by the prosecutor's office [18,19].

5. LIABILITY FOR AIR ACCIDENTS

When an aircraft accident occurs, it is necessary to determine civil or criminal liability. In Polish legislation, criminal liability for causing a disaster or an accident in air traffic is regulated by the Penal Code (Article 173 et seq.) [20-22]. In addition, Section XII of the Polish Aviation Law Act defines penal provisions, while Section XI specifies civil liability. Liability for damage caused by aircraft traffic is subject to Article 435 et seq. of the Polish Civil Code, which specifies liability for damage caused by the use of mechanical means of communication driven by forces of nature [23]. Apart from the above, international law has regulated air carrier liability for personal injury in the Warsaw Convention and the Montreal Convention. The air carrier is liable if an event that caused the death, wounding or any other bodily injury of a passenger took place on board one of its aircraft or in the course of any of the operations associated with embarking or disembarking [24-26].

Furthermore, in line with court judicature, the air carrier is liable if "the accident" is an unexpected, unpredictable and unusual event [27]. According to the Warsaw Convention, the air carrier is liable on the basis of the presumption of guilt, and this liability is limited to the sum of 125,000 francs in compensation. On the other hand, the Montreal Convention specifies risk-based carrier liability as well as compensation limits for passenger death or injury in relation to 100,000 "special drawing rights". According to both conventions, the carrier may be exonerated from its liability if it manages to prove that the damage was not caused by its negligence or wrongful act, and that it took all reasonable steps to prevent it. In addition, the air carrier is responsible for persons acting on its behalf and its subcontractors, including the pilot-in-command, aircraft crew, commercial agents and ground control staff [28,29].

6. SUMMARY

An aircraft accident is an unexpected and random event, while civil aviation authorities are faced with the difficult challenge of ensuring passenger safety. In view of the task entrusted to them, civil aviation specialists are making perpetual efforts to introduce strict regulations that

enforce compliance with procedures, airport control rules and cabin crew training requirements. Unfortunately, it is not possible to completely eliminate the risks associated with air transport. The only solution is to do everything to prevent any circumstances that could lead to an aircraft accident. However, it is important to note that, owing to the work of aircraft accident investigation commissions, we can draw conclusions that could prevent aviation disasters in the future. By making recommendations in reports, air carriers, aircraft builders and flight crews provide their feedback and often implement changes in rules and regulations, training standards or aircraft construction. In this way, the number of aircraft accidents drops year by year, which reflects increases in the safety of air transport and boosts passenger confidence in commercial airlines.

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