



THIRTEENTH AIR NAVIGATION CONFERENCE

Montréal, Canada, 9 to 19 October 2018

COMMITTEE B

- Agenda Item 7: Operational safety risks**
7.2: Operational safety risks at the global, regional and national levels, and the role of RSOOs and RASGs in achieving the GASP goals

BIRD HAZARDS – HIGH RISK IN OPERATIONAL SAFETY

(Presented by Colombia, supported by the SAM States²)

EXECUTIVE SUMMARY

This paper presents the importance of safety events such as loss of control in-flight (LOC-I), controlled flight into terrain (CFIT), runway excursion (RE), runway incursion (RI) and mid-air collision (MAC) within the Global Aviation Safety Plan (GASP, Doc 10004), due to its severity; however, within the definition of risk, the concept of probability should be considered. In this sense, it is very important to take into account events of BIRD type, by the frequency of occurrence, that is, by their probability.

Action: The Conference is invited to:

- a) promote the inclusion of this topic in the GASP; and
- b) promote the inclusion of Bird-Strikes data, as well as the identification of airspaces with greater probability of occurrence of these events in iStars.

1. INTRODUCTION

1.1 The term *bird hazard*, is the threat posed to aircraft and their operation by the presence of wild birds in and around the airports. Birds activity in areas where aircraft operate, especially at low altitude and particularly in areas near the aerodromes, in the approach path or departure trajectories, becomes an imminent risk to these aircraft due to the possibility of sustaining a bird strike during their take off and climb or approach and landing phases, which are precisely the most critical phases of the flight.

1.2 Bird strikes can cause serious damage to aircraft and in the worst case the loss of human life. No airport or aircraft is immune to a bird strike. On the other hand, besides colliding with aircraft, wild fauna nesting or burrowing inside the airports can cause structural damage to buildings, pavement, equipment and aircraft, as well as cause discomfort and health problems to workers.

¹ English and Spanish versions provided by Colombia.

² Supported by 13 Contracting States (Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Ecuador, Guyana, Panama, Paraguay, Peru, Suriname, Uruguay and Venezuela (Bolivarian Republic of)).

1.3 The nature and magnitude of the problem that a particular airport faces will depend on many factors such as the type and volume of air traffic, the populations of local and migratory fauna and the habitat conditions in the area. Wildlife is attracted to an airport by food, water or habitat found at the airports or in their surroundings, like facilities that generate physical conditions that attract them, such as garbage dumps, refrigeration facilities, activities that are attractive for certain species of birds, barns with grain exposure, inadequate handling of food or organic waste, or even zoos near the aerodromes. These factors, combined with the high speed, little noise and vulnerability of modern aircraft, are the basis of the bird-strike problem currently faced by transport operators, as well as aerodrome operators.

1.4 The bird-strike problem goes hand in hand with the history of aviation. When birds and aircraft share the same airspace, a conflict scenario is created. There are numerous references which demonstrate this phenomenon, among which we can highlight the following cases:

- "Five years after his first flight in 1903, Orville Wright reported a bird-strike while flying near Dayton, Ohio."
- "On April 3, 1912, Calbraith Rogers, the first person to cross the United States from coast to coast, became the first fatality after suffering an accident as a result of a bird-strike in the coast of California."
- The most recent and widely known case is that of US Airways flight 1549 in which the airplane had taken off from La Guardia Airport at 3:11 p.m. local time with 150 passengers and five crew members. Less than two minutes into flight during the climbing phase, at a height of 850 meters, the Airbus 320 was hit head-on by a dense flock of birds (geese) damaging both engines.

1.5 In relation to the economic cost that this problem generates, it is estimated that about 1.2 billion dollars are lost annually in different aspects such as total replacements, repairs, insurance, ground time, etc. It has also been established that a large part of the bird-strikes and damages are concentrated in the aircraft turbines which represent the most sensitive part of an aircraft and also the most expensive to repair. (Source: special study conducted for the El Eden Airport of Armenia – Colombia: [ftp://ftp.ani.gov.co/Aeropuertos%20Armenia%20Neiva%20VJ-VE-APP-IPB-005-2015/2%20INF%20TECNICA/INVERSIONES/5.g\)%20MEDIO%20AMBIENTE/ARMENIA/estudios%20de%20peligro%20aviario/VOL%201/GENERAL_ARMENIA_2012.pdf](ftp://ftp.ani.gov.co/Aeropuertos%20Armenia%20Neiva%20VJ-VE-APP-IPB-005-2015/2%20INF%20TECNICA/INVERSIONES/5.g)%20MEDIO%20AMBIENTE/ARMENIA/estudios%20de%20peligro%20aviario/VOL%201/GENERAL_ARMENIA_2012.pdf)).

1.6 According to a research carried out by the CAR/SAM Regional Bird/Wildlife Hazard Prevention (CARSAMPAF) Regional Committee, which includes States of Central, Caribbean and South America, the topic has been widely explored in developed countries, where the history of airports wildlife management has more than thirty years of constant developments; however, in our countries we barely have ten years of experience in the best of cases. (Aerocivil website <http://www.aerocivil.gov.co/servicios-a-la-navegacion-aerea/gestion-ambiental-y-peligro-aviario/peligro-aviario>).

2. ANALYSIS

2.1 Taking history into account and knowing that bird-strikes can lead to catastrophic consequences (loss of life or the total loss of an aircraft), it is necessary now to address the problem from a risk analysis point of view. Understanding the term risk as the assessment of the consequences of a hazard in terms of probability and severity, it becomes relevant to pay more attention to the very high probability evident in the consequences derived from bird-strikes.

2.2 In the case of Colombia, as well as in other regions of the globe, there are high rates of bird strikes. The previous graph depicts the behavior in rates regarding the reports of actual and near bird-strikes classified in the Accident/Incident Data Reporting (ADREP) taxonomy, and it is clearly evident that, during one year or another, the part corresponding to BIRD, has the highest incidence (probability of occurrence) compared to the behavior of other taxonomies (Source: Reportes MOR allegados a Autoridad de Aviación Civil en Colombia – Aerocivil).

2.3 In the last ten years, there have been four serious incidents in Colombia, associated with BIRD and one accident (in 2009) associated with the WILD taxonomy, which led to a runway excursion (RE). (Source: ECCAIRS – Colombia).

2.4 Although the direct consequence of a bird strike does not necessarily lead to an accident, and therefore is not seen with the same severity of a controlled flight into terrain (CFIT), RE, runway incursion (RI) , loss of control in-flight (LOC-I) or mid-air collisions (MAC) whose most foreseeable consequences will be catastrophic, it is very true that it can be the cause of, for example, LOC-I with a HIGH probability or of a runway excursion, as it has already happened.

2.5 Going back to the definition of risk, bird strikes are known cases with high probability, although not necessarily of high severity in themselves. However, in order to maintain coherence between the concept and the action levels, as well as staying in favor of consistency for management and the responsibilities involved in the analysis of events, both statistically and operationally (not only on the part of the Civil Aviation Authorities State safety programme (SSP), but also involving the aviation service providers through their safety management system (SMS), it is necessary to prioritize this issue, in order to get the community to strengthen the causality analysis and to look for alternatives to reduce the rates of occurrence and, with it, the risk levels (evaluation of probability and severity).

2.6 It is important to highlight that the concentration of birds is often due to the granting of construction permits for spaces such as garbage dumps, refrigerators, etc., by municipalities or entities of a territorial or state nature; such areas close to the aerodromes, attract especially certain types of birds and increasing the probability for this type of fauna to appear.

2.7 In this regard, in meetings of the Regional Aviation Safety Group – Pan America (RASG-PA) and the Pan-America – Regional Aviation Safety Team (PA-RAST) the issue of bird strikes has been addressed, however, to this date, there have been no meaningful actions generated to support the States with solution proposals to this respect. In fact, at the meeting held in June 2017 in Mexico City, a presentation was made with statistics of incident reports under the BIRD taxonomy, which showed that El Dorado airport in Bogotá presents the highest rates of bird strikes occurrence, with values even higher than those calculated in the statistics for Tocumen airport in Panama. It is worth noting that El Dorado airport ranks in third place in number of operations in Latin America, making the exposure to risk even higher.

2.8 On the other hand, it is important to highlight that there are already important tools such as:

- a) the ICAO Bird Strike Information System (IBIS);
- b) professionals (biologists, environmentalists, etc., involved and trained in aviation matters) who can deal with this subject with a completely professional and specialized perspective; and

- c) Information technology that allow applying and analyzing the statistical behavior of the occurrence of events involving birds, including their seasonal characteristics, migrations and other associated behaviors,

2.9 What is missing is the prioritization and promoting the incorporation of this issue as one of the priority topics of the Global Aviation Safety Plan (Doc 10004, GASP). Additionally, it would be very important to have compiled and statistical information, within the iStars, allowing all interested parties to learn about migratory behavior and seasonal characteristics (for example) that could affect aviation.

3. CONCLUSIONS AND RECOMMENDATIONS

3.1 The aeronautical community should focus its efforts on carrying out analyzes which will lead them to reduce the probability of operational safety occurrences that are evidenced as the precursors to those of greater severity, especially those events whose mathematical evidence presents a high probability.

3.2 The event that par excellence presents a special characteristic of high probability around the world and, especially, in times of bird migration, is bird strikes; apparently this event converges in airspaces where there is a greater concentration of air routes.

3.3 Thus, the aeronautical community and other territorial components (municipal governments) can generate better contributions to the reduction of the occurrence of events of this nature; the aeronautical authorities must count on the strengthening of standards, from ICAO documents that allow "persuading" those governmental bodies, not to grant operation permits or the operation of some activities that may be attractive for the fauna that ends up becoming a threat to aviation ; ICAO can generate not only guidance documents on this topic, but can also generate spaces (iStars) where information and data can be shared regarding events with birds, their annual seasonal behavior and other data relevant to air operations and operational safety.

3.4 The conference is invited to take note of this working paper, to make comments and to circulate a conclusion proposal to be adopted by the members on the following matters:

- a) promote the inclusion of the matter of bird strikes (BIRD) in the GASP;
- b) invite the States to share their incident statistics, as well as the strategies or actions implemented, aimed at controlling the occurrence of such incidents, through the ICAO – iStars; and
- c) promote the inclusion of bird strikes data and airspaces with greater probability of occurrence, through an "app" developed for that purpose in iStars.

— END —