

**AIR TRAFFIC SAFETY CONCERNING THREAT OF COLLISION OF BIRDS
AND AIRCRAFT, WITH REGARD TO THE SITUATION
IN THE REPUBLIC OF CROATIA**

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Abstract

The collision of birds and aircraft is known as “bird strike” and it represents serious danger for air traffic. Therefore, all parties to air traffic must apply legal regulations, prescribed measures, recommendations and stated standards regarding control of appearance of birds in airports’ areas.

On international level, air traffic bird strike regulations and recommendations may be found in ICAO Annexes. In the Republic of Croatia, aircraft safety protection rules are prescribed in Air Traffic Law Rules and in Airport Safety Statutes.

As far as airport operators are concerned, their legal obligation is to avoid causes of damages. They have duty of care to ensure a safe operational environment for all airport users, what includes responsibility for hazards caused by flocks of uncontrolled birds unless all necessary measures for effective reduction of bird population or for scaring birds away from airport property are taken.

Damage liability is very often stated in case of bird strike. It is the special legal and obligatory relation between parties involved in any particular case. Concerning protection of airport from possible damage situations, especially with regard to lessening or exoneration of liability, it is desirable to provide a safe environment in which an aircraft may move. It is indispensable for every airport to adopt determined procedures. The adoption of these procedures means that they must be applied at any time, because, in case of eventual legal procedure, it is necessary to prove their application before or in the moment of that actual bird strike.

In the Republic of Croatia, all available actions and methods are undertaken regarding control of appearance of birds on and in the vicinity of airports. Bird control team – special national committee, must supervise these activities. In other words, it is indispensable to create special plans and programs and to start their realisation in order to achieve a complete persons and property protection. These programs may not function as isolated self-reliant acts. They must be in accordance with national air traffic safety policy, and they must be compatible with use of surrounding land programs for which the state and local self governing and governing bodies are in charge. Finally, the desired aim of these programs is to turn airports into safe areas on one side and into least suitable and least attractive places for birds on the other side. Thereby, the danger of eventual bird strike would be either eliminated, or at least significantly reduced.

Key Words: Republic of Croatia, Split Airport, ICAO, Bird strike, Environment, Plans, Bird control team, Programs, Land use, Liability, Regulations, Food, Water, Sound.

1. Introduction

Taking into consideration the importance of airports, particularly from the point of view of economy, and tendency of constant progress of technology and services, the efforts are made, and the success is evident, to create such conditions that make possible the implementation of the highest standards of comfort and safety for all users of airports. Safety is definitely one of the most important segments in the air traffic as a whole and the inadequacy of the corresponding regulations, or the absence of any, in the definite air traffic field conditions the following:

- The inefficiency of the proper supervision;
- The inconsistent or non application of the existing regulations;
- The attitudes of the parties to air traffic that are not responsible enough, what may cause the occurrence of harmful events bearing serious consequences for people as well as for property.

The problem of air traffic safety is considered exceptionally carefully all over the world and the results gained in that field are getting better and better, primarily reflected by the lessened number of air crashes, accidents, and some other incident situations.

For all parties involved in air traffic in the Republic of Croatia (airport operators, aircraft operators and air traffic control personnel) the careful and thorough observing and application of legal regulations, prescribed measures,

recommendations and stated standards are of outmost importance. On account of listed reasons, and on the basis of other European countries' experiences, it is indispensable to follow these experiences in the implementation of air traffic safety regulations.

Special measures and activities referring to **control of the appearance of birds in airports' areas** are incorporated in overall air traffic safety measures. Birds have represented a potential danger to aircraft since the very beginning of air traffic. They are especially dangerous in the light of nowadays significant technological progress when the speed of aircraft is growing and noise levels are lower and lower, particularly with the development of turbo-engines. The aircraft are too speedy and too silent for birds to feel and to evade them. Therefore, they have become a very serious threat to the safety of aircraft, and thereby to the safety of air traffic in general.

2. Collision of birds and aircraft

The collision of birds and aircraft is known in the air traffic terminology as "bird strike", which may be defined as "the collision of birds and aircraft within or outside the airport area, with possible influence to the safety of further flight of an aircraft, in case a bird is sucked in by, or it crashes into one of the aircraft's engines, or in case a bird crashes into a fuselage or a wing of an aircraft, the result of what may be a damage of aircraft, as well as injuries or death of passengers or crew members".

Consequently, the appearance of birds at airports may represent a significant problem and create difficulties in realisation of normal air traffic procedures. Many airports in the world deal with birds' situation nowadays. This problem has been treated very seriously for quite a while. Many activities are in progress, primarily from the aspect of prevention. Therefore, significant financial funds from the side of state bodies, airports, aircraft manufacturers, aircraft operators and orders are invested in avoiding close encounters between aircraft and birds.

As it is known, the risk of collision between aircraft and birds has been growing pretty fast over the past decades due to the above-mentioned reasons. As far as the situation in the Republic of Croatia is concerned, we may be exceptionally pleased with the fact that we have an insignificant number of bird strike situations, particularly bearing in mind the fact that many colonies of seagulls live along the Adriatic Sea shores where 7 airports are situated (Dubrovnik, Bra_, Split, Zadar, Lo_inj, Rijeka and Pula). Only 2 airports are located in the inland of Croatia (Zagreb and Osijek).

However, establishing the fact that there are not enough indicators, analyses and statistical data in the Republic of Croatia, I think it is indispensable to form databases, as qualitative and as complete as possible, regarding events that happened in at least the last ten years. This would enable us to start creating the qualitative national program of bird and mammals control in the airport area and its vicinities, and to determine concrete measures and activities, particularly aiming at lessening presence of birds in airport areas. This activity should be co-ordinated by a specially founded national committee, in co-operation with the Ministry of Maritime Affairs, Transport and Communications, Ministry of Defence, Ministry of Agriculture, all airports, national air carrier and Air Traffic Control. At present, airports each bring their own bird control programs and state measures to be applied at first hand.

3. Normative regulation of air traffic protection - bird strike protection

Civil Air Traffic Regulations dealing with the problem of air traffic bird danger may be divided into:

- a) International Regulations; and
- b) National Regulations.

Air traffic bird strike protection rules on the international level may be found in ICAO Annexes.

We may not find any concrete rules regarding air traffic bird strike protection in the Republic of Croatia law and legal regulatives. However, as this kind of protection falls under air traffic safety domain, the instructions for application of these measures, i.e. for the prevention of aircraft safety hazards, may be found in Air Traffic Law Rules and in Airport Safety Statutes.

The Air Traffic Law Rules prescribe for all air traffic participants: airport operators, aircraft operators and Air Traffic Control, the obligation of application of safety measures for air traffic as a whole.

Article 84., Paragraph 1.:

“In accordance with rules of this Law, and in accordance with regulation brought on the basis of this Law, an airport operator takes over the obligation to provide maintenance and inspection of operational grounds, premises, installations, devices and equipment at an airport, to undertake all measures indispensable for safe take-off, landing and stay of an aircraft, and for aircraft, passengers, baggage and cargo handling and landing, respectively”.

Consequently, it is evident that the obligation of every airport is **to provide maintenance and control** of runways, taxiways and apron with regard to

inadmissible presence of birds or other animals. In addition, it is the obligation of an airport **to undertake all necessary measures** to prevent the presence of animals on the operational areas, and all in order to provide safety for any expected aircraft operations.

Article 101., Paragraph 2.:

“Captain of an aircraft is a pilot who, in principle, operates the aircraft, who is responsible for the flight of the aircraft, its safety and safety of all persons on board, from the moment when one or more persons board the aircraft with intention to fly, to the moment of disembarking of all persons from the aircraft”.

The duty of an aircraft operator, i.e. the captain of an aircraft as the representative of the airline company and as the responsible person on board, is to undertake all safety measures regarding safety of aircraft and all persons on board. Therefore, it is his obligation to undertake all actions and to inform other participants in air traffic in case he notices birds the presence of which might endanger air traffic safety inside operational areas.

Article 109., Paragraph 1.

“In the field of the Republic of Croatia flight information, aircraft must fly and move through operational areas in a prescribed manner and in accordance with clearances or instructions released by Air Traffic Control in charge”.

In case of appearance of birds in operational areas, Air Traffic Control deals with it by issuing or by not issuing the clearances for moving through these areas, until they are completely safe for performing any operation.

The Airport Safety Statutes prescribes to airports the obligation of constructing an all around fence of determined height to prevent uncontrolled access of people, vehicles and animals. However, we may not find any concrete rules regarding protection from bird presence in the airport area.

In my opinion, national law must regulate and must impose duties and obligations of airport operators and other users of airport facilities regarding wildlife control at the airport.

In other words, airport operators in particular must have a legal obligation to take reasonable care to avoid causing damage. It is their responsibility to ensure a safe operating environment for all airport users. Also, airport operators must warn airport users against the possibility of any safety risk. In any case, airport operators are responsible for hazards caused by flocks of uncontrolled birds if they do not undertake all necessary measures for effective reduction of bird population or for scaring birds away from airport property. This means that the first line of defence in protecting aircraft from birds is to manage the airport and its surroundings properly. Land inside

airport boundaries has to be managed in such a way that it does not attract any animals, and birds in particular.

4. Damage liability

Unfortunately, in case of a bird strike complete aircraft may be destroyed or damages of some parts may occur. The condition of damage may be such that it does not influence the further safety of flight, or, on the contrary, it may prevent the continuation of flight, depending upon the part where the bird strike happened. Consequently, depending on the case, an aircraft operator may suffer

greater or smaller damage and passengers and crew may be injured and may carry serious consequences, respectively. In these circumstances, from the property and legal aspect, the damage liability is stated. According to legal theory **damage liability** is a special legal and obligatory relation that obliges one side to repair or to compensate to the other the damage caused, while the other side in the capacity of damaged party is entitled to demand repair or compensation.

With regard to the particularity of the situation in question, we have to take into consideration several very significant factors of major importance for the determination of damage liability:

1. Air traffic participants (airport operator, aircraft operator, Air Traffic Control);
2. Place and moment of the bird strike;
3. Consequences of bird strikes with regard to further flight safety.

It is important to mention that in the Republic of Croatia legal practice we find very few legal verdicts regarding bird strike and concerning liability of any participant in air traffic. Consequently, with all due respect to the quoted legal regulation and other Republic of Croatia law rules, I believe that determination of damage liability is definitely a theoretical and academical question that includes rigorous and thorough legal analysis of all circumstances as to whether, to what extent and when a single air traffic participant is liable for damage occurred as a result of a bird strike. From the point of view of airport protection from possible damage situations, particularly with regard to lessening or exoneration of liability, I believe that it is desirable to provide a safe environment in which an aircraft may move, while I also consider it indispensable for every airport to adopt set procedures. The adoption of these procedures means that they must be applied at any time, because, in case of eventual legal procedure, it is necessary to prove their application before or at the moment of that particular bird strike.

5. Activities undertaken on and in the vicinities of airports

On the basis of existing experiences in the Republic of Croatia the activities that are, or should be, undertaken in the control of appearance of birds on and in the vicinity of airport may be grouped as follows:

- a) Activities regarding use of land within and around airport property;
- b) Activities regarding application of different methods of scaring birds away from airport areas.

When speaking about activities regarding land use within or around airports, that kind of lands actually favours the habitability for different bird species. The manner of use of surrounding land should obligatorily be planned in co-operation with local self-governing authorities in charge, thus directing the economical and urban development. It may be stated that in airport surrounding areas we often find objects that are very attractive to birds, like: fish growing sites, garbage disposal sites, cattle farms and fairs, slaughter houses and the like; all of which should definitely be as far away of an airport as possible.

When talking about airport area in the context of appearances and movements of birds, we do not exclusively think about the area within boundaries that determines the real airport property, but also about surrounding areas used by birds. So, on that basis, we might talk about narrower and wider airport areas where the birds stay. Birds appear in airport areas for different reasons, most often if attracted by essential living things like:

- Food;
- Water; and
- Shelter on, or in the vicinity of airport.

To prevent the presence of birds in the airport area means to choose the most effective method of scaring them away. The choice of the proper method is the result of detailed and meticulous analysis of bird species and their way of living in the particular area. Permanent application of different scaring away and disturbing methods shows the significant lessening of bird populations around airports.

Concretely, we find medium-size birds as sea gulls, crows and small-size birds as sparrows, swallows and starlings at Split Airport, and we use different methods to scare them away. We divide these methods into several groups like:

1. Sound effect scaring means;
2. Visual scaring means; and
3. Other scaring means.

There are different sub methods and sub groups of scaring means depending on number, kind and size of birds within every mentioned group. For example:

- Sound effect scaring means include different pyrotechnical means, alarms, sirens, hunter weapons with harmless ammunition, etc.
- Visual scaring means include different scarecrows.
- Other scaring means may include different traps, obstacles placed particularly in possible nesting places or in places where birds find food or water, regular grass cutting, use of falcons, etc.

Zagreb Airport, for example, uses falcons as bird protection mean, and it shows very positive results.

6. Proposals, suggestions and tasks

As a direct air traffic danger, the problem of wildlife hazards (bird and other animals strikes) should be dealt with on the highest level in the Republic of Croatia, by the special national committee. The aim of founding such a committee may be summarised in the following facts:

1. Enabling of flow and exchange of information;
2. Supporting of collecting of accurate wildlife hazards data, and their analysing;
3. Supporting of development of new technologies in purpose of lessening the wildlife hazards;
4. Supporting of airport authorities professional approach to creating of protection program; and
5. Co-operation with similar bodies from other countries and with international organisations.

To reduce potential sources of danger, that in the utmost case may not be completely eliminated, to the smallest extent, it is indispensable to undertake activities primarily by creating a special National Bird Appearance Control Program on the basis of which the local airport committees can be formed and the creation of separate airport programs can be started.

In order to make these programs efficient and appropriate, a complex approach to their creating, and particularly to their realisation, is indispensable. It is obligatory that the Ministry of Maritime Affairs, Transport and Communications, airport operators, national air carrier, Air Traffic Control and, if necessary, other relevant ministries and institutions (Defence, Agriculture, ornithologists, biologists) should all participate.

Engagement of airport representatives in establishing the program would comprise the obligation of suggesting direct measures and activities with regard to:

- Securing of operational areas from the presence of birds, i.e. maintaining of these areas suitable for use excluding any danger factors;
- Planning and providing of financial funds for running of program stated activities;
- Planning of future investments in airport areas that will not be interesting for birds during or after their construction;
- Co-operation with scientific institutions that are involved in studying the life and migrations of birds.

Air Traffic Control personnel should participate in creating a program so that they support permanent methods of control of airport areas from the first appearance of birds and promptly inform the airport representative about any observed occurrences that might endanger air traffic safety.

Aircraft operators, aircraft crew first of all, and aircraft captains in particular, must be acquainted with any airport bird control and bird fighting policy, and actions undertaken in that area. It is of utmost importance for these persons to offer their estimation of situations, and their advice regarding bird appearance control. With regard to this problem a very qualitative and complete co-ordination and exchange of information between aircraft crew and Air Traffic Control personnel must be established. Subsequently, the same kind of co-operation must be established between the latter and airport bodies in charge.

I would like to point out once again that, on the basis of all stated above, it is imperative to create these programs and to start their realisations in order to achieve a complete persons and property protection and in order to co-ordinate the existing airport programs with aims and tasks stated on higher levels, respectively.

7. Conclusion

Airports are attractive for birds as habitats, food sources, temporary stays or just as loitering area. Any kind of presence of birds at airports may represent extreme danger for air traffic safety. The most effective way of reducing their presence at airports or around them is to create qualitative programs with the aim of fighting and reducing their very presence.

Moreover, airport bird control programs may not function as isolated self-reliant actions. They have to be in accordance with national air traffic safety policy, and they must be compatible with use of surrounding land programs for which the state and local authorities and governing bodies are in charge.

These programs must primarily be understood as efforts aiming to even greater air traffic safety and the efforts made in their implementation as an

attempt made at reducing factor of danger caused by appearance of birds in airport areas to minimum. These programs try to reduce the number of birds at airport areas by application of different biological, biotechnical and

technical measures, taking, at the same time, care of ecological conditions and criteria imposed from the point of view of human environment protection.

Realisation of these programs impose to all participants mentioned as those being in charge of particular activities such attitude in undertaking necessary actions that would show results that represent a step ahead in terms of improvement of air traffic safety, i.e. in terms of protection of persons and property.

Finally, in my opinion, the desired aim of these programs would be to turn airports into safe areas on one side and into least suitable and least attractive places for birds on the other side. Thereby, the danger of eventual bird strike would be either eliminated, or at least significantly reduced.