



**GOVERNMENT OF INDIA  
OFFICE OF DIRECTOR GENERAL OF CIVIL AVIATION**

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## **AERODROME ADVISORY CIRCULAR**

**Subject: Guidance on Wildlife Hazard Management**

### **1. INTRODUCTION**

- 1.1. The presence of wildlife (birds and animals) on and in the vicinity of an aerodrome poses a serious threat to aircraft operational safety. Operators of licensed aerodromes are required to take the necessary actions to identify, manage and mitigate the risk to aircraft operations posed by wildlife by adopting measures likely to minimize the risk of collisions between wildlife and aircraft, to as low as reasonably practicable.
- 1.2. This circular lays down the general guidelines for establishment of wildlife management plan at an aerodrome. The principles in this document are coherent with the wildlife strike hazard reduction requirement of CAR Section 4 Series B Part I para 9.4
- 1.3. The purpose of this manual is to provide airport operator with the information necessary to develop and implement an effective bird/wildlife control setup for their aerodrome. This manual outlines organizational structures that will effectively deal with the problem of bird/wildlife control. ICAO Airport Services Manual Part 3 (Doc 9137) may also be referred for detailed guidelines. Detailed procedure related to these guidelines are required to be included in aerodrome manual
- 1.4. It is important to note that this circular on its own does not change, create, amend or permit deviations from regulatory requirements nor does it establish minimum standards.

### **2. ORGANIZATION SETUP WITH IN AERODROMES**

- 2.1. Depending on the scale of the aerodrome (proportionate to the size, traffic and complexity), some of the functions underneath can be combined, except for the

Safety Manager that acts independently of the other managers. The aerodrome operator should develop organization chart accordingly.

2.2. The following roles and responsibilities of personnel associated with wildlife management should be specified at an aerodrome in addition to Accountable Manager and safety manager, as they contribute to the effectiveness of a wildlife management program:

- a) A senior line manager responsible for the wildlife management program. He assures the wildlife risk is properly assessed, determines the policy of the program and provides the resources for the effective implementation.
- b) The wildlife control coordinator is responsible for the day-to-day management and effective implementation of the program. He is also the technical specialist within the organization that advises the senior management. He supervises the wildlife control records, identifies the wildlife risks and proposes updates of the wildlife management program.
- c) Wildlife controllers maintain the surveillance of the wildlife activity on the aerodrome, records the activity and advises the duty airside operations officers on the detected wildlife risks. They implement the wildlife control measures in accordance with the wildlife management program.
- d) The duty airside operations officer is responsible for taking the appropriate decisions including notification to ATS concerning the aircraft operations on the aerodrome based on reported wildlife observations, the advice of the personnel of the wildlife control unit, and possible wildlife occurrences and incidents.
- e) An aerodrome operator can also make use of external wildlife chasers when deemed appropriate. It is nevertheless important to underline that they always work under the responsibility of the aerodrome operator and that they are following the orders of the wildlife control coordinator.

2.3. The aerodrome should establish and hold Aerodrome Environment Management Committee (AEMC) meetings and delegate appropriate personnel to participate in the AEMC and to contribute to the realization of the agreed action plan in time bound manner.

2.4. Aerodrome personnel associated with wildlife management should be properly trained and competent:

- a) The senior management functions (accountable manager, responsible line manager and safety manager) understand at least the nature and extend of the aviation wildlife management problem. The need for extra training depends on the task division between the wildlife control coordinator and the responsible line manager.
- b) The wildlife controller should at least be competent in the following topics:

- i. aviation wildlife management program;
  - ii. applicable regulations;
  - iii. local wildlife ecology;
  - iv. wildlife observation and identification on the aerodrome and where practicable, beyond the aerodrome boundary;
  - v. on and off aerodrome habitat management;
  - vi. active risk reduction techniques;
  - vii. use of equipment for wildlife control;
  - viii. identification of wildlife strike remains.
- c) The wildlife control coordinator is the technical specialist within the organization. He should be competent in the following topics:
- i. same as the wildlife controller;
  - ii. planning, organizing and supervising wildlife control operations;
  - iii. international, national and regional regulations and their implementation;
  - iv. monitoring habitat changes on and in the vicinity of the aerodrome, and the development and implementation of appropriate management and control activities and the effectiveness;
  - v. analysis and interpretation of log records of wildlife control activities, wildlife strike reports and on- and off- aerodrome wildlife count data;
  - vi. actions to reduce the presence of birds and to prevent bird strikes, including new techniques and equipment;
  - vii. ensuring the supply and safe storing of equipment and consumables;
  - viii. issue of NOTAM / ATIS system warnings as required to notify stakeholders of specific wildlife hazard related information.
- d) Other personnel of the wildlife control unit should be competent according to their responsibilities within the wildlife control program and the complexity of the program. In addition, they will at least understand how to survey the wildlife activity on the aerodrome, record the activity and advise the coordinator or else the duty airside operations officers, on the detected wildlife risk. An important part of their training will be dedicated to the use of the equipment and techniques used for wildlife control.
- e) The duty airside operations officer understands the nature and extend of the aviation wildlife management problem and knows how to react in case of increased wildlife observations or possible wildlife occurrences and incidents.

### **3. WILDLIFE HAZARD IDENTIFICATION AND RISK ASSESSMENT**

- 3.1 Aerodromes should conduct a formal risk assessment of their wildlife strike risk and use the results to help target their wildlife management measures and to monitor their effectiveness.
- 3.2 The total number of wildlife strikes should not be used as the only measure of risk or performance of the wildlife control measures at an aerodrome. Aerodrome

operators also conduct an inventory of bird attracting sites on and in the vicinity of the aerodrome, paying particular attention to the approach and departure corridors.

3.3 Wildlife live on and around aerodrome property for a variety of reasons, however they are usually attracted by such essentials to life as food, water and shelter. Typical examples of hazards are:

- a) agricultural activities- fertilizing, ploughing, harvesting,
- b) Waste, garbage dumps and landfills
- c) Sewage treatment and disposals
- d) Lakes and ponds, water reservoirs, swamps
- e) Open terrains and grass land
- f) Warm pavements and roof surfaces
- g) Trees, shrubs, bushes,
- h) Buildings, gutters, hangars,
- i) Aerodrome equipment, markers,
- j) Coast, fish processing
- k) Lights attracting insects

3.4. A systematic method of obtaining information regarding wildlife strike risk on and in the vicinity of the aerodrome should be used. A typical risk assessment process may involve:

- a) A hazard description, identifying wildlife species, associated habitats and seasonal factors that influence the size and the behavior of wildlife populations in the area. A basic assessment to determine whether the movement patterns of birds attracted to sites on and in the vicinity of the aerodrome may cause a risk to air traffic.
- b) The determination of the acceptability of the level of risk by combining the probability and the severity.
  - i. An assessment of the probability of a wildlife strike with a particular species, taking into consideration the current mitigation procedures in place.
  - ii. An assessment of the severity of the outcome of a wildlife strike, taking into consideration the size of the species. Special attention will be given to the number of birds involved (solitary or flocks) and serious multiple wildlife strikes.
- c) The identification of possible further risk management options available.

3.5. This process should be reviewed annually to ensure validity by identifying new risk or changes in the existing risk levels.

#### **4. WILDLIFE MANAGEMENT PROGRAM - RISK REDUCTION TECHNIQUES**

4.1. Based on the results of the risk assessment, an action plan is developed to eliminate, reduce or mitigate the risk. Each aerodrome implements a wildlife

management program tailored to the conditions on the site. This program should include both habitat management and active wildlife control, and might include lethal methods subject to local wildlife regulations.

## 4.2. HABITAT MANAGEMENT

4.2.1. The aerodrome should be made unattractive for wildlife by adoption of habitat management strategies, adapted for the (most dangerous) type of wildlife that is targeted.

- a) Fencing of the aerodrome
- b) Removal of bushes, deadwood,
- c) Removal of fruit trees
- d) Use of spikes
- e) Removal of cadavers, insects
- f) Closed garbage bins, FOD policy
- g) Protecting covers over water (balls, nets)
- h) Steeper shores towards water surfaces
- i) Less attractive agriculture: beets, potatoes, chicory, turnips
- j) Long grass policy

4.2.2. Aerodrome operators should establish contact with landowners around the aerodrome, develop constructive relations with them and encourage them to adopt measures to reduce the attractiveness of the site to birds or to mitigate the risk.

4.2.3. In addition to reducing the attractiveness of the site, it is also important to avoid creating new habitats on the aerodrome. And also in the vicinity of the terrain, aerodrome operators (should seek dialogue and cooperation with developers and should intervene as far as possible into planning decisions by the regional governments and incompatible land use practices in the vicinity of the aerodrome for any development that may attract significant numbers of hazardous birds.

4.2.4. The most effective habitat control measure that can be applied on the aerodrome is the management of the grass areas. Most birds dangerous to aircraft prefer short grass. Only partridges, pheasants and some small low weight birds prefer long grass. A long grass policy is no final solution and can only be successful if intensive grass maintenance is applied:

- a) A rigid cutting scheme needs to be followed, depending on the season and the meteorological situation. Too long grass that falls over because it cannot support itself, also has the potential to attract birds.
- b) The use of organic or inorganic fertilizers on an aerodrome is only acceptable if this is necessary to maintain the quality of the grass land. After this process, special attention from the personnel of the wildlife control unit is necessary.
- c) Freshly cut grass should be removed from the aerodrome site as soon as possible, as it might attract a lot of wildlife activity. Dead growth and

accumulated clippings from past cuts can form an intensive layer of decaying material that might weaken the grass.

- d) Special seed mixtures can limit the grass length to medium heights. The frequency of grass cutting can then be reduced. For the choice of a seed mixture, also the composition of the soil and the seed production of the grass (no agricultural grasses) have to be taken into consideration.

### 4.3. ACTIVE METHODS OF BIRD CONTROL

4.3.1. Before considering the use of an active method to disperse or deter wildlife on the aerodrome, consideration should be given to the fact that doing nothing may in some cases be a better choice than chasing birds away and losing control. In certain cases it can be acceptable to tolerate the presence of birds on certain parts of the airfield, if this is well documented.

4.3.2. In general, during daytime constant surveillance of the aerodrome by the wildlife control unit is necessary. At airports where the number of aircraft movements is very low (less than 1 movement per 15 minutes), the wildlife control unit should check the situation prior to any aircraft departure or arrival.

4.3.3. Bird activity is generally at lower level at night than during daytime. At night, active runways and taxiways are inspected for the presence of wildlife at regular intervals and dispersal action is taken when needed. It is recommended that active methods should be used with caution at night as the risk may be increased by fleeing animals.

4.3.4. There are various dispersal and deterring methods with varying levels of success. In most cases it is effective to use a combination of more than one method. By varying the approach used and the combination of scare techniques, often the effectiveness will be increased.

- a) Human presence is the simplest method of dispersing wildlife. Also, animals will often react to the presence of the vehicle of the wildlife control unit if they associate it with being harassed.
- b) The use of distress calls is effective with certain kind of birds as long as the birds are correctly identified and the right distress calls are used. For certain species, this method cannot be used.
- c) Gas cannons and other (mobile) noise makers remain effective methods, but variation is needed to avoid habituation. These devices have to be under control of the wildlife control unit, the use of automatically generated noises can be dangerous.
- d) Kites, balloons, flags, scarecrows, reflective objects, rotating spinners are cheap visual deterrents, but they show very rapid habituation.
- e) Pyrotechnic scaring cartridges / flare guns are within the limits imposed by its range more rapidly mobile than birds. It enables to control the direction of movement of target flocks. By positioning themselves and aiming the pistol appropriately, it is possible to keep a flock on track and keep the birds together.

- f) Repellents are substances that animals may find unpleasant due to their taste, smell or touch.
- g) Green laser beam guns seem to be effective to chase water birds away from the water surfaces at the airport.

#### 4.4. LETHAL METHODS

- 4.4.1. If there is no other satisfactory course of action for preserving air safety, lethal methods can be employed subject to strict adherence to the wildlife and security regulations in vogue and required permissions thereto.

### 5. WILDLIFE STRIKE REPORTING AND RECORD KEEPING

- 5.1. Most wildlife occurrences can be defined in the following categories:

- a) Confirmed strikes:
  - i. any reported collision between bird or other wildlife and an aircraft for which evidence in the form of a carcass (or other remains) are found on the ground, or damage and/or other evidence is found on the aircraft.
  - ii. found cadavers for which no wildlife strike was reported, but where the cause of death is indisputably a strike.
- b) Unconfirmed strikes:
  - i. reported collisions between a bird or other wildlife and an aircraft for which no physical evidence is found (no damage to the aircraft, no remains, no blood smears.
  - ii. Other significant bird or other wildlife incidents where the presence of wildlife in the air or on the ground resulted in an effect on a flight but where no strike occurred:
  - iii. near miss occurrences;
  - iv. rejected take-off;
  - v. go-around;
  - vi. Wildlife found dead on the aerodrome where there is no obvious link with a collision with an aircraft.

- 5.2. Wildlife strikes will be reported using the Wildlife Strike Reporting Form as promulgated vide DGCA Air Safety Circulars in vogue on the subject.

- 5.3. In the reporting and investigation of wildlife occurrences, special attention should be given to confirmed multiple bird strikes and turbine bird ingestions.

- 5.4. The aerodrome operator ensures that the species of wildlife carcasses can be identified as correct as possible after a wildlife strike by an in-house specialist or external ornithologist.

- 5.5. Reports of wildlife incidents should be made available both internally (to the wildlife control coordinator, the wildlife controllers, the duty airside operations officers and the safety management unit) and externally (to the DGCA)
- 5.6. Aerodrome operators should establish a mechanism that allows them to get informed about the wildlife strikes reported on or near their aerodrome.
- 5.7. Wildlife controllers should record the wildlife presence on the aerodrome, their control activities and the results of these actions. The intervals for recording depend on the scale of the aerodrome (proportionate to the size, traffic and complexity of the aerodrome). The logging of this information is important for two main reasons:
  - a) After a wildlife strike, the aerodrome will be able to demonstrate what actions have been taken to prevent the incident.
  - b) If this information is well processed and analysed, it can be a very valuable input for the yearly risk assessment and possible update of the wildlife management program.

## **6. EVALUATING THE WILDLIFE CONTROL PROGRAMME**

6.1 Wildlife hazard prevention should be an integral part of the aerodrome safety management system. The following questions are directed at airport management. These questions assist in determining if there is an effective bird/wildlife control programme in place at an airport.

### 6.1.1 Local risk assessment

- a. Has a bird/wildlife strike reporting procedure been implemented at the airport?
- b. What is the bird/wildlife strike rate at the airport over the last five years (with or without damage to the aircraft)?
- c. Is there a procedure to collect regularly information about birds/wildlife, both dead (carcasses) and living?
- d. Has a means for positively identifying carcass remains been established?
- e. How many reports from pilots are related to intrusions of wildlife, other than birds, over the last five years?
- f. Has a list of bird/wildlife attractants at and surrounding the airport been completed?

### 6.1.2. Wildlife control programme

- a. Is there a wildlife control officer responsible for the management of wildlife on the airport?
- b. Has a land-use plan been established with regard to effective land use on and off the airport as it pertains to the wildlife control programme?
- c. What ecological measures are implemented to reduce wildlife attractiveness at the airport and in the vicinity?
- d. Is there a habitat management programme on the airport?

- e. Are garbage dumps forbidden around the airport? If yes, within what distance are they forbidden?
  - f. Is the airport fence suitable to prevent hazardous animal incursions?
  - g. Which scaring methods are implemented at the airport?
  - h. Have staff been employed and trained specifically to scare off birds/wildlife at the airport?
- 6.2 The aerodrome operator has to provide working procedures to assist the personnel of the wildlife control unit in their daily work. These procedures can be published as part of the wildlife management program or as a separate document.
- 6.3 Particulars of the procedure to deal with danger to aircraft operations caused by the presence of wildlife in the aerodrome flight pattern or movement area, including arrangement for assessing any wildlife hazard, arrangement for implementing wildlife control programmes, arrangement with local civil authorities for resolving conflicting issues between land use and aircraft safety along with names and roles of the persons responsible for dealing with wildlife hazards, and their telephone numbers during and after working hour shall be included in Aerodrome manual.

Sd/-  
(J S Rawat)  
Jt. Director General