



WORKING PAPER

ASSEMBLY — 41ST SESSION

TECHNICAL COMMISSION

Agenda Item 30: Aviation Safety and Air Navigation Policy

30.3 Relevant Outcomes of the High-level Conference on COVID-19, Safety Stream (HLCC 2021)

RISK BASED APPROACH TO WILDLIFE HAZARD MANAGEMENT

(Presented by India)

EXECUTIVE SUMMARY

This paper presents the various steps taken by India to contain the hazard emanating from the wildlife in and around airport premises. India has identified wildlife hazard as one of the Key Safety Priority as part of National Aviation Safety Plan (NASP). Due to the activities and actions under NASP, there has been reduction in percentage of wildlife strikes, which caused damage. The paper also presents the approach of aerodrome operator under its Safety Management System for containing the wildlife hazards.

Action: The Assembly is invited to:

- a) share the best practices on wildlife hazard management and
- b) urge all states for risk based approach for wildlife hazard management.

<i>Strategic Objectives:</i>	This working paper relates to Strategic Objectives on Safety.
<i>Financial implications:</i>	
<i>References:</i>	Annex 14 — <i>Aerodromes</i> Doc 9137, <i>Airport Services Manual, Part 3 — Bird Control and Reduction</i> Doc 9981, <i>Procedures for Air Navigation Services (PANS) - Aerodromes</i>

1. INTRODUCTION

1.1 The most common aviation safety occurrence reported across the globe is wildlife strikes.

1.2 ICAO Annex 14 — *Aerodromes, Volume I — Aerodrome Design and Operations* requires that the wildlife strike hazard on, or in the vicinity of an aerodrome shall be assessed through:

- a) the establishment of a national procedure;

- b) the collection of information from aircraft operators, aerodrome personnel and other sources, on the presence of wildlife strike on or around the aerodrome .constituting a potential hazard to aircraft operations; and
- c) an ongoing evaluation of the wildlife hazard by competent personnel.

1.3 The requirements for the wildlife hazard management are contained in CAR Section 4, Series B, Part I.

1.4 CAR Section 5, Series C, Part I prescribes the procedure for the reporting and collection of the information.

1.5 The wildlife strike database is forwarded to ICAO as per their requirements for inclusion in the ICAO Bird Strike Information System (IBIS) data base.

1.6 In last ten years of Indian aviation, there have been one accident in the year 2014 and two accidents in the year 2015 occurred due to wildlife strike.

1.7 To assess and control the hazard due to wildlife strike it has been identified as a Key Safety Priority in the National Aviation Safety Plan (NASP). Its performance is measured annually through a set a performance indicators, objective and targets through the analysis of the wildlife strike data collected. The following associated safety indicator are being monitored for achieving the desired objective:

- a) number of reported bird strikes at Indian airports per 10,000 movements;
- b) number of reported wildlife strikes at all Indian airports per day; and
- c) number of runway incursions by wildlife at all Indian airports per day.

1.8 To achieve the desired objective, India has developed a safety action plan in consultation with the stakeholders and ICAO guidance.

1.9 Aerodrome operators following the national requirements and national aviation safety plan are managing the hazard through their safety management system.

2. **DISCUSSION**

2.1 In order to monitor the effectiveness of the safety action plan, data is being collected through mandatory reporting system using a standard format conforming to IBIS requirements.

2.2 All wildlife strike reports are assessed and action plan are formulated based on the analysis of the aggregate data. The action plan may include review of wildlife hazard management by the critical airports, taking up issue with the local municipal authorities for the management of the area outside the airport.

2.3 As part of effective implementation of NASP in India, the percentage of wildlife strike causing damage to aircraft have reduced from 12 per cent to 8 per cent from the year 2018 to 2021 respectively and the wildlife strike rate (i.e. total confirmed wildlife strike per 10,000 movements)

reduced from 2.96 to 2.12 during period 2018 to 2019. During COVID-19 period i.e. 2020, the wildlife strike rate has increased to 5.06. After assessment of wildlife hazard management post pandemic, DGCA India stressed on integrated wildlife hazard management activities which resulted in reduction of confirmed wildlife strike rate to 3.99 for the year 2021. The total wildlife strike has also followed this pattern.

2.4 ***Wildlife hazard management by the Aerodrome Operator***

2.4.1 One of the airport in India, located in city known as the garden city due to its vast area of lush green garden and availability of many shallow lakes, where about 400 native species of wildlife/birds are present as resident population round the year has adopted risk based approach under its Safety Management System for the Wildlife Hazard Management Program (WHMP). This city is a well sought out destination for many migratory species and every year more than 13,000 migratory wildlife/birds are sighted around and this leads to high airspace occupancy of bird along with aircraft which can often lead to conflict. To have a safe flying environment in this ecosystem, aerodrome operator conducted wildlife hazard assessment survey to know about the topography, flora and fauna in and 13 kms around the airport to assess the threat level posed by wildlife to operations. Based on survey, aerodrome operator developed actions and procedure to reduce and deter away the wildlife from the critical area of the aerodrome.

2.4.2 The survey revealed the presence of following species of wildlife:

- a) 147 species of wildlife in & around;
- b) 4 Species of mammals in critical areas (including 3 types of bats);
- c) 11 species of Snakes (4 venomous);
- d) 6 species of Lizards;
- e) 7 species of Toads;
- f) 42 type of Butterflies;
- g) 3 species of Moths; and
- h) 3 species of bees

Potential sources of attraction within airside – It was assessed and nil threat observed

Potential sources of attraction outside airside – Excavation impact (Rodents/reptiles) due to urbanization

2.4.3 ***Zones for wildlife hazard management***

2.4.3.1 For mapping the fauna around, 13 km radius area is divided into four zones for engaging wildlife hazard management measures effectively:

- a) Primary Hazard Zone - The airside area of the airport;
- b) Secondary Hazard Zone - Area within Airport premises;

- c) Tertiary Hazard zone - Approach funnel; and
- d) Low Hazard Zone - Other areas beyond the above zones within 13 Kms around airport

2.4.4 ***Wildlife/bird movement mapping over the critical area***

2.4.4.1 All the birds movements are recorded from dawn to dusk daily with standard sampling model which is being analyzed to derive the critical movement pattern over Primary Hazard zone. Airport area falls in the transit (cross over) location for many species (Scavengers/Raptors – Large sized wildlife/bird having body weight > 700gms) from their roosting site to feeding site at countryside on north side of the airport. There are about 400 wildlife/bird crossings sighted regularly over the critical area in the morning and they go back to their roosting sites in the evening following the same path. Potential hot spots over critical areas have been identified and a robust management plan has been prepared along with Operating Manual and procedures. Daily bird movement reports are generated and circulated among to all the stakeholders. Duty wildlife hazard controller conducts regular field inspection to identify any wildlife incursion or habitat which attracts wildlife/birds to airside. Controller also conducts bird warning period patrol to alert and guide the bird scarers to effectively clear the bird from the aircraft movement path.

2.4.5 ***Integrated wildlife hazard management plan***

2.4.5.1 Wildlife/birds are attracted to airport for the availability of large open area for gaming, training, apart from their usual instincts on feed, water and shelter. All the departments dealing with at airside impacting the habitat of airside are put together with wildlife team to form up a integrated wildlife hazard management program. This team conducts monthly inspection on airside to identify the potential source of attraction for wildlife/birds and initiate mitigation action. Also all the works planned at airport area is controlled by permit until the concerned projects team assures about the control measures in place for the project site.

2.4.6 ***Airside vegetation management plan***

2.4.6.1 The basic strip of runway/taxiway up to 30 meters are maintained with green cover while ensuring the basic strip up to 10 meter area is maintained within 10 cms grass height to provide coverage to ground mammals/reptiles from the birds sight. The area beyond 10 meters the grass height is maintained up to 20 cms to the rest of the area up to 150 meters and beyond this area the grass height can be grown up to 1.5 feet but the areas is to be maintained without any wildlife attraction. Fruit and flower bearing trees/plants are not allowed at airside for plantation. The following process and procedures are developed to maintain the airside habitat in a sterile state to keep away from wildlife:

- a) developed a vegetation management plan for the airside;
- b) conducted a grass and soil study for the airside of the airport;
- c) mapped the airside area for fauna;
- d) conducted hazard ranking of species;
- e) categorized hazardous and least hazardous species;

- f) engaged species specific treatment action;
- g) the entire airside area has been transformed to a non-conducive area for wildlife/birds and its attractants by changing the grass species on basic strip(10 meter area) 4 times during the 15 years of operation;
- h) passive control activities increased by attending 60 rodent burrows per week on critical area (during maintenance slot); and
- i) closed about 60 makeshift fish breeding ponds within the near vicinity of airport.

2.4.7 Measures taken up for effective management:

- a) 13 Km radius of the airport is divided into four quadrants from Airport Reference Point (ARP) and monthly Airfield Environment Management Committee (AEMC) survey around the airport is organized with the stakeholders along with the area village head to identify the potential hazardous site attracting birds.
- b) Quarterly AEMC sub-committee meeting to seek government support involving all stakeholders including law and enforcement agencies, for management of aerodrome surrounding area for clearance of bird attraction.

2.4.8 **Results**

2.4.8.1 Due to effective WHMP implementation over the aerodrome the bird strike involvement with potential hazardous species during day has reduced from 33 %(13 numbers of Pariah Kite in 2008) to 3%(1 number of Pariah kite in 2019), Similarly potential hazardous species of nocturnal wildlife has reduced from 19%(5 numbers of Owl in 2013) to 3 % (1 Number Owl in 2019).

— END —