54th CONFERENCE OF DIRECTORS GENERAL OF CIVIL AVIATION ASIA AND PACIFIC REGIONS

Ulaanbaatar, Mongolia
07 — 11 August 2017

AGENDA ITEM 5: AVIATION & ENVIRONMENT

ENVIRONMENTAL FRIENDLY AIRSIDE VEGETATION MANAGEMENT

(Presented by India)

INFORMATION PAPER

SUMMARY

Wild life (Bird/Animal) strike to aircraft is one of the state safety priority. Many of the Indian airports have been considered critical in respect of wild life strikes. One of the control measures adopted is to control vegetation around airport environs which requires both active & passive measures to diminish the vegetation, thereby reduce the number of Birds/Mammals/Reptiles.

Some Indian Airports have tried out environment friendly vegetation management. A promising approach to reduce wildlife attraction towards an airside of an airport is the use of environmental friendly herbicides which is specially manufactured to be comfortable to the relevant issue of environmental protection to airports.

Best practices developed for vegetation management by using herbicides to mitigate the vegetation growth for eradicating bird menace is shared with the

ENVIRONMENTAL FRIENDLY AIRSIDE VEGETATION MANAGEMENT

1. INTRODUCTION

1.1 Wildlife - Aircraft collisions pose a serious safety risk to the aircraft. Aircraft collisions with birds could be fatal and accounted for 97% of reported strikes, whereas strikes with mammals & reptiles were 3% & < 1% respectively. The damage increases with the size and weight of the bird involved and the speed of the aircraft & impact location. Development of larger, faster and quieter aircraft jet engines and increase of air traffic caused an increase in the number of incidents.

1.2 The presence of large birds like kites, vultures are considered to be greatest threat to an aircraft. Presence of mammals wandering on to runway can create serious problems for an aircraft. Aircraft collision with wildlife annually cost the civil aviation industry a huge amount in direct damage and in associated cost and huge hours of aircraft down time. Economic cost of wildlife strikes are extreme and may involve occasional loss of human life.

1.3 India has recorded a constant 9 to 10 wild life strikes/10,000 departures for the period from 2012-2016 across all Indian airports with 14% inflicting damages. Data shows that 38% of strikes happen in the landing roll, 22% in the takeoff, 18% in the approach phase. 15% are observed during post flight inspections.

1.4 It is generally accepted that an airport must adopt an effective Environmental Management Action Plan with an aim to meet the twin objectives (a) Vegetation Management (b) Bird Hazard Control Management, which are fundamentally related to safe aircraft operations. A high power National Bird Control Committee has been set up by Government of India. Several seminars have been conducted by DGCA and airport operators to educate stakeholders on management of wildlife hazards.

1.5 Measures adopted by Wildlife Control Management Units at various airports are systematic process of identifying bird movements in the critical locations and on airside on daily basis, process of monitoring and mapping of wildlife movement pattern, regular grass cutting in basic strip area, effective disposal of organic material outside the airside areas to avoid insect attraction.

1.6 There is an intrinsic correlation between vegetation growth at airport and bird activities. Long grass management is a widely used as an effective method and generally considered as a right approach. Grass upto 15cms height strongly diminishes the attraction to foraging of resting birds. The availability of food is less. The higher grass is found to be more suitable place to breed and provide food, shelter and nesting opportunity.

1.7 The mismatch between rate of growth of vegetation at the airports and pace of clearing it by using conventional method of vegetation management is a serious challenge. The problem is particularly acute during the monsoon during which bird activity and bird strike at the airport record an alarming increase.

1.8 The scale of bird activity accelerated by growth of vegetation necessitated urgent mitigation measures such as eco-friendly measures which are beyond the known technique of vegetation management for effective and lasting solutions for controlling the vegetation and reduced bird activities.

2. USE OF HERBICIDES

2.1 As part of the remedial measures, a pilot project was taken up at Coimbatore International Airport in coordination with Tamil Nadu Agricultural University to spray herbicides mixed in defined quantity in the operational area to mitigate vegetation growth. Spraying of herbicides, mixed in defined quantity, was carried out in a phased manner in the operational area to mitigate vegetation growth. Mechanized sprayers was used for applying herbicides in the airfield.

2.2 Before commencement of herbicide spraying, training was imparted to the concerned officials in Identification of different components of herbicides, Proper ratio for mixing of herbicides, weeding agents etc., Demonstration of mixing and filling the mixture into the Boom sprayer tank and Precautions to be taken while mixing and spraying of herbicides.

Operational area at the time of spraying

Operational area after Phase I of Herbicide spraying

Operational area after Phase 2 of spraying

Wall to Wall view of operational area

2.3 Spraying of herbicides had to be monitored daily. Results of spraying became visible in a week time. Uncovered / inaccessible areas were identified for application of herbicide using portable power sprayer. Areas of tall grass were cut using grass cutting machine even after application of herbicide.

2.4 Application of Herbicides is an effective method to restrict growth of vegetation over large area. Recurrence of vegetation growth is restricted when herbicides are applied in a phased manner. The growth of vegetation after one year of implementation of AVM indicated an exponential decrease over the corresponding period in the previous year.

2.5 The possibility of enhanced vegetation growth during rains although could not be ruled out, the Scientists were of the opinion that over the years this impact is also bound to be minimal.

3. ANALYSIS OF BIRD HIT DATA PRIOR TO IMPLEMENTATION OF AIRSIDE VEGETATION MANAGEMENT:

3.1 Coimbatore International Airport had witnessed high instances of Bird activity which resulted in large number of Bird hits. The airport in coordination with Tamil Nadu Agricultural University undertook environment friendly methods including usage of herbicides in vegetation management. The results have been encouraging.

3.2 **BIRD HIT DATA PRE VEGETATION MANAGEMENT (From 2010 to 2015)**

Time/Year	2010-11	2011-12	2012-13	2013-14	2014-15	Total
1-2	0	0	0	0	0	0
3-4	3	5	3	5	6	22
5-6	1	1	1	1	0	4
7-8	0	1	2	0	7	10
9-10	1	2	1	2	0	6
11-12	1	1	0	1	0	3
13-14	1	0	0	0	0	1
15-16	1	3	0	1	0	5
17-18	0	6	1	1	2	10
19-20	2	1	1	0	6	10
21-22	1	0	2	2	2	7
23-24	1	0	0	0	0	1
Total	12	20	11	13	23	
BIRD HIT AVERAGE DURING NIGHT PRE AVM						8.8
BIRD HIT AVERAGE DURING DAY PRE AVM						7
BIRD HIT AVERAGE PRE AVM						15.8

3.3 **ANALYSIS OF BIRD HIT DATA AFTER IMPLEMENTATION OF AIRSIDE VEGETATION MANAGEMENT:**

Time/Year	2015-16	2016-17	Total
1-2	0	0	0
3-4	2	2	4
5-6	0	2	2
7-8	1	0	1
9-10	0	0	0
11-12	0	1	1
13-14	2	1	3
15-16	0	3	3
17-18	4	0	4
19-20	0	3	3
21-22	2	2	4
23-24	0	2	2
Total	11	16	

BIRD HIT AVERAGE DURING NIGHT POST AVM	7.5
BIRD HIT AVERAGE DURING DAY POST AVM	6
BIRD HIT AVERAGE POST AVM	13.5

4 ANALYSIS OF COST FACTOR:

4.1 The expenditure incurred for herbicides since implementation of AVM Rs.3.5 lakhs for the entire phases. Considering an area of 250 acres of land in airside, the cost of herbicides as on date is Rs.1400 per acre per annum (approximately US $ 22).

5. BIRD ACTIVITIY PATTERN – INFERENCES PRE AND POST AVM FROM THE ABOVE DATA

5.1 Change in the pattern of bird/animal activities has been observed after the implementation of AVM. The activities of large birds such as kites and vultures have reduced significantly post AVM. Aircraft operations being effected by bird hits post AVM is NIL as compared to 04 in the corresponding period prior to AVM. The average number of bird hits post AVM is 13.5 as compared to 18 in the corresponding period prior to AVM. It is also less than the last five year average of 15.8.

5.2 Menace due to mammals and other animals have reduced to almost nil. The visibility of the operational area from wall to wall has significantly improved both the safety and security perspective.

6. CONCLUSIONS

6.1 Vegetation growth pattern has recorded a significant change during the period of Airside Vegetation Management. The rate of growth of vegetation has sharply reduced with every successive phase of herbicides spraying, giving the operational area a clean look and making it easier to maintain the operational area. Significant reduction in bird activity of larger birds observed post AVM. The average bird hit post AVM is significantly less than the corresponding period in the pre AVM. Flight disruption / delay due to bird hits post AVM has reduced to NIL.

7. ACTION BY THE CONFERENCE

7.1 The Conference is invited to:

a) note India's experience in using environment friendly herbicides for managing Airside vegetation management;

b) consider adoption of similar measures at airports with wild vegetation growth and wild life strikes;

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