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| Procedure | Brunei DCA | |
| | Aerodromes Standards Section | |
| ADR 003 | Wildlife Hazard Management at Aerodromes | |
| | Issue No: 02 | Date: 01 October 2019 |
| | Procedure Owner: Head of Aerodromes Standards Section | |

Wildlife Hazard Management at Aerodromes

| RELATED MATERIAL | ASSOCIATED MATERIAL |
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| Brunei Civil Aviation Order 2006 | ADR 016 Bird Strike Wildlife Reporting Form |
| BAR 14 and BAR 19 | |

1 Introduction

- 1.1 This document provides information and guidance material for Aerodrome Inspectors to enable them to assess how an aerodrome operator is showing compliance with BAR 14, and, in particular, paragraph 9.4 on wildlife strike hazard reduction.
- 1.2 This document also provides information and guidance material for the aerodrome operator on how to develop and establish wildlife hazard management at aerodrome that compliance with BAR 14, in particular paragraph 9.4 on wildlife strike hazard reduction.
- 1.3 There are various sources of guidance material for the aerodrome operators to support this activity such as that provided by the International Birdstrike Committee, ACI and the ICAO Airport Services Manuals (in particular Doc 9137 Part 3 Wildlife Control and Reduction).
- 1.4 The term '*in the vicinity*' (or surroundings) is interpreted to mean land or water within 13 kms of the aerodrome reference point and to landfill and waste disposal sites as defined by local legislation. An 'appropriate authority' is deemed to be an authority that has the power to take action in a particular situation.
- 1.5 Although ICAO and EASA now refer to the subject matter as '*wildlife*' (defined as animals/mammals and birds), for simplicity, consistency and to avoid confusion, throughout the majority of this document the term '*birdstrike*' is used. Where direct quotes from ICAO or EASA references are quoted, '*wildlife*' may be used.
- 1.6 This document therefore focuses on risks posed to aircraft by birds as they are the probably the greatest risk from wildlife. If it is evident that there are wildlife hazards other than birds, then specialist advice should be sought from the relevant authorities and agencies.
- 1.7 Certification standards for airframes and aircraft engines provide modern commercial aircraft with a measure of resistance to birdstrike damage. This is, however, proportionate to the size and type of aircraft, with light, or GA aircraft and helicopters having no birdstrike certification standards for windshields or airframes.
- 1.8 Aviation safety agencies and regulators worldwide have produced guidance, standards and policy documents to help aerodrome and aircraft operators in managing and mitigating birdstrike and wildlife strike risks.

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2 Policy or Policy Reference

BAR 14 provisions paragraph 9.4 for Wildlife strike hazard reduction are as follows:

9.4.1. *The wildlife strike hazard on, or in the vicinity of, an aerodrome shall be assessed through:*

- (a) *the establishment of a national procedure for recording and reporting wildlife strikes to aircraft;*
- (b) *the collection of information from aircraft operators, aerodrome personnel and other sources on the presence of wildlife on or around the aerodrome constituting a potential hazard to aircraft operations; and*
- (c) *an ongoing evaluation of the wildlife hazard by competent personnel.*

9.4.2. *Wildlife strike reports shall be collected by the aerodrome operator. These reports shall include but not limited to the following information:*

- (a) *date and local time of occurrence,*
- (b) *aircraft type,*
- (c) *runway,*
- (d) *phase of flight,*
- (e) *wildlife species,*
- (f) *effect on flight, and*
- (g) *whether pilots warned of wildlife activity.*

Note.1 - Hardcopies/ softcopies of these reports shall be submitted monthly to the DCA Brunei Regulation Division for inclusion in ICAO Bird Strike Information System (IBIS) database and to be forwarded to ICAO. A sample of the wildlife strike reporting form is shown in Appendix IV attached in this document.

Note.2 – The IBIS is designed to collect and disseminate information on wildlife strikes to aircraft. Information on the system is included in the Manual on the ICAO Bird Strike Information System (IBIS).

9.4.3. *Action shall be taken to decrease the risk to aircraft operations by adopting measures to minimize the likelihood of collisions between wildlife and aircraft.*

9.4.4. *The appropriate authority in Brunei shall take action to eliminate or to prevent the establishment of garbage disposal dumps or any other source which may attract wildlife to the aerodrome, or its vicinity, unless an appropriate wildlife assessment indicates that they are unlikely to create conditions conducive to a wildlife hazard problem. Where the elimination of existing sites is not possible, the appropriate authority shall ensure that any risk to aircraft posed by these sites is assessed and reduced to as low as reasonably practicable.*

9.4.5. *Recommendation - States should give due consideration to aviation safety concerns related to land developments in the vicinity of the aerodrome that may attract wildlife.*

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3 Purpose and Scope

3.1 The primary purpose of this document is to facilitate the reduction of bird and wildlife strikes and the process to be employed can be split into three areas:

- identify hazards
- evaluate management options
- develop strategies to manage risk.

3.2 Any strategies should focus on deterring birds from flying in the same airspace as aircraft on and in the near vicinity of the aerodrome, and primary control options include:

- aerodrome habitat management
- active control procedures
- safeguarding

3.3 Each aerodrome location presents a unique habitat that influences the type and population of bird species present. It is therefore essential that the most appropriate and effective measures are identified and adapted to suit local conditions.

3.4 When addressing the hazard posed by birds and wildlife, stakeholders must ensure their actions are lawful. Licences or clearances maybe required for some activities to preserve air safety. It is important to make sure that all personnel involved are familiar with equivalent national or local regulations and any restrictions that apply to wildlife management activities.

3.5 An aerodrome accountable manager must be satisfied that any aerodrome wildlife control personnel (in house personnel or third party contracted out) act within the provisions of any relevant licences or clearances.

4 Procedure – Wildlife hazard management plans

4.1 An Aerodrome Operator shall have a Wildlife hazard management plan that:

- assesses the wildlife hazard on, and in the vicinity of, the aerodrome;
- establishes a means and procedures to minimise the risk of collisions between wildlife and aircraft;
- notify the appropriate authority if a wildlife assessment indicates conditions in the surroundings of the aerodrome are conducive to a wildlife hazard problem.

4.2 As a minimum, a management plan should include details of:

- persons who are accountable for developing and implementing the risk assessment programme, overseeing the control activities, analysing data and carrying out risk assessments;
- risk assessment methodologies that are to be conducted and the risk mitigation measures that are in place;
- policies and procedures for reducing wildlife strike risks on the aerodrome including:

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- processes for effective on-aerodrome habitat management;
- flexible use of a range of deterrent, dispersal and control measures to prevent habituation from occurring.
- details of any relevant permissions or licences for control measures;
- recording of control activities;
- reporting control issues to aerodrome management and airside or flight safety committees;
- recording and analysis of strike reports, (e.g using Mandatory Occurrence Reports etc);
- logging species, observations, intelligence and subsequent data analysis;
- policies for bird control during hours of darkness and low visibility operations.

4.3 The management plan should be referenced or included in the Aerodrome Manual and made available to the Brunei DCA for audit and compliance monitoring purposes.

4.4 Measures detailed in the plan should relate to the threat posed by each identified risk, but should also include details on how measures may change due to changes in bird and wildlife activities; for example, dealing with seasonal change or following collection of wildlife data. The measures should include the wildlife control techniques described in this or other authoritative documents, at the aerodrome operator's discretion.

4.5 Whichever techniques or tools are used, priority should be given to reducing the presence of large and flocking birds and, where practicable, to managing other congregations of birds that present a significant threat to aircraft safety whether on or off-aerodrome.

5 Procedure – Safeguarding Systems

5.1 Safeguarding systems need to be put in place to guard against new or increased wildlife hazards caused by developments both on and in the vicinity of an aerodrome.

5.2 They should include details of activities employed by the aerodrome operator to control or influence areas beyond the boundary of the airfield, in the vicinity of the aerodrome (up to 13 km and in some instances beyond, or less than 13km, as determined by risk and effectiveness of interventions), and where practicable, could include:

- establishment of a process with the local planning authorities for consultation on proposed developments that have the potential to be wildlife attractant within 13 km of the aerodrome;
- means to influence land use and development surrounding the aerodrome such that the strike risk does not increase and, where practicable, is reduced;
- means to help encourage landowners to adopt wildlife control measures and support landowners' efforts to reduce wildlife strike risks, via land use agreements and;
- procedures to conduct and record the results of off-aerodrome site monitoring visits.

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6 Procedure – Record Keeping

6.1 It is essential to record all bird and wildlife control activities undertaken both tactically and strategically and on a daily basis, and details of this should form part of the plan. This data can be used to:

- evaluate the success of risk management programmes;
- identify areas requiring attention;
- highlight key risk periods;
- provide a record of activities that were being undertaken in the event of an incident and follow-up investigation.

6.2 There is no standard list of details that must be collected, but the following are a useful guide:

- Name of the Bird Control Unit (BCU) operative on duty;
- Start time;
- Finish time;
- Time for each activity or record;
- Location of activity;
- Species details of the bird or other wildlife observed and/or dispersed;
- Numbers of each species seen, including nil returns;
- Dispersal action taken;
- Reaction of wildlife to dispersal;
- Direction of dispersal;

6.3 For airports with an aircraft movement every 15 minutes or more, the International Birdstrike Committee recommends recording any action as it is undertaken, but also that a record is added to the log *at least* every 30 minutes, even when no active control took place or observation was made.

7 Procedures – Review and Evaluation

7.1 Procedures to monitor and evaluate the effectiveness of bird or wildlife control strategies might include:

- wildlife control performance monitoring, measurement and improvement systems;
- personnel training, competence assessment and appraisal.

7.2 An analysis of bird and wildlife strikes should be undertaken periodically (at least annually) and after any significant strike event has occurred as part of the risk assessment process. Recording information is essential to provide evidence that active bird control is in place in the event that an incident occurs, and equally provides an opportunity to assess and evaluate fluctuations in wildlife occurrences in different areas of the airfield.

8 Roles and Responsibilities

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- 8.1 The roles and responsibilities of all personnel are important elements of the aerodrome operator's safety management system (SMS) and contribute to the effectiveness of the wildlife/birdstrike management plan.
- 8.2 Where aerodrome bird control is outsourced and provided by third party management companies, there must be auditable mechanisms in place, such as a service level agreement, to ensure that only trained, assessed and competent personnel are employed.
- 8.3 The aerodrome operator shall ensure that when contracting or purchasing any part of its activity, the contracted or purchased service or equipment or system conforms to the applicable requirements. The aerodrome operator shall ensure that the competent authority is given access to the contracted organisation, to determine continued compliance with the applicable requirements.
- 8.4 Contracted organisations should have a thorough understanding of their roles and responsibilities as set out in the management plan, and be able to work effectively with other organisations as required, both on and off aerodrome, such as air traffic control and local landowners etc.
- 8.5 The roles and responsibilities may be adjusted to suit an aerodrome's specific hazard and control circumstances, but the following describes the type of roles and responsibilities that are typically included in wildlife hazard management plans.

9 Bird Control Manager / Co-ordinator

- 9.1 The aerodrome operator has overall accountability for wildlife hazard management at the aerodrome, but responsibility for wildlife control and the delivery and implementation of the management plan at the aerodrome is typically delegated to a coordinator, airside service delivery, or compliance manager. Their primary objectives should be to:
1. ensure that personnel understand how to assess and determine wildlife hazard and strike risks; understand the hazard management plan and have adequate resources to implement the plan;
 2. manage implementation of the plan via internal audit and periodic review;
 3. review statistical analysis of strike records;
 4. ensure the results of strike analysis are communicated to management and stakeholders as appropriate.
 5. monitor habitat changes on and in the vicinity of the aerodrome, and develop and implement appropriate management and control activities;
 6. ensure adherence to habitat management, airfield grass policies and associated maintenance programmes
 7. understand the implications of not managing wildlife strike hazards effectively and not following the plan and initiating any necessary changes;
 8. analyse and interpret records (shift logs) of control activities, strike reports and on and off-airfield observations and intelligence;

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9. understand the need for periodic surveys of bird and wildlife concentrations and movements in the local area (up to or beyond 13 kms as determined by aerodrome management policies);
10. work with, for example, local landowners, farmers, gamekeepers, local nature reserve managers and racing pigeon organisations in order to influence and raise awareness of bird hazard matters;
11. consult and engage with aerodrome planning development and engineering departments regarding safeguarding proposals, and engage with planning applicants where a proposed development has potential to change risk (e.g. restoration of mineral extraction sites);
12. monitor the effectiveness of any bird and habitat management measures via quality audit or similar process;
13. identify potential wildlife strike risks through collation of local ornithological reports and survey data;
14. seek advice and assistance from outside specialists on matters requiring expertise not available at the aerodrome;
15. produce reports on specific bird hazard issues, safety briefs and issue warnings to pilots via NOTAM, ATIS or AIP as necessary;
16. ensure wildlife control record-keeping (recording observation counts, strike recording and reporting, dispersal, culling and habitat management diaries, etc) are correctly recorded in a manner that can be easily interrogated and audited;
17. ensure that all necessary training, passes, permits and licences are current;
18. ensure the supply and safe keeping of equipment, including firearms and lasers.

10 Aerodrome bird/wildlife control personnel

10.1 Control personnel (or Bird Control Units BCU) are responsible for the direct delivery of control duties on the aerodrome and enacting the management plan to counter any wildlife presence on the airfield that presents a potential risk to aircraft flight safety. As such, the wildlife control personnel's duties should include:

1. maintaining surveillance of wildlife activity on the aerodrome and around the aerodrome boundary;
2. implementing wildlife control measures in accordance with the plan to counter any detected wildlife strike risk;
3. providing information to air traffic control with details of potential wildlife strike risks and management activities as they occur;
4. recording and reporting all confirmed, unconfirmed, near-miss or suspected wildlife strikes;
5. advising the aerodrome certificate/licence holder and/or the accountable manager of habitat control issues on the airfield and identifying improvements to the wildlife control process, and;
6. assisting with wildlife/bird surveys and gathering and recording intelligence.

11 Risk Identification

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11.1 Assessment of Bird/Wildlife Strike Risk

The aerodrome operator should develop and maintain a systematic method of obtaining information regarding hazardous wildlife species and their habitats to manage them effectively. This should include:

- assessing the hazards in the context of aircraft operations;
- analysis of strike records to identify how many of each species have been struck over specific periods of time;
- identification of species more likely to cause damage to aircraft, such as flocking birds and larger, heavier species, particularly waterfowl;
- development of a risk assessment methodology to inform the control programme in accordance with policies set out in the management plan.

11.2 Details of existing wildlife locations and wildlife movements both on and off the aerodrome should be recorded to provide a baseline and allow resources to be targeted effectively, and a risk assessment should then be carried out. The record and risk assessment should include:

- detailed information of wildlife, identifying species, size, numbers and habitats that influence wildlife population and behaviour, and likely aircraft damage in the event of a wildlife strike
- risk information that can be quantified in the short and long term, dependent upon wildlife population and seasonal changes, including an assessment of the frequency of serious multiple wildlife strikes
- the potential and continuing risks, so they can be assessed on a comparable basis
- control actions focused in a structured manner
- the determination of the acceptability of the level of risk by summing the probability and severity, based on a probability/severity matrix
- the development, implementation and monitoring of an action plan to eliminate, reduce or mitigate risks.

11.3 Probability and Severity of a Strike

Probability of strike risk for different species can be calculated using, ideally, data recorded from the last 5 year period to provide an annual average number of strikes for inclusion in a matrix. Accurate up to date records are invaluable. Using local wildlife strike data, severity can be calculated by species, based on the percentage of strikes that caused some form of damage to an aircraft.

12 Wildlife attractant habitats and Managing the Risks

12.1 Aerodrome and off-Aerodrome environments provide a wide variety of attractants for wildlife and these should be identified and assessed to determine the most appropriate prevention, controls, reduction and eradication actions. Typical areas for review are:

- Food sources
- Open terrain, grass management,

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- Landscaping can create new hazards
- Water, Reservoirs, Lakes, Ponds and the Coast
- Landfills, Sewage Treatment and Food Wastes
- Sand, gravel and clay pits
- Agricultural attractants.

12.2 Effective habitat management is the most important activity in reducing wildlife presence. Techniques should be used to remove or reduce potential habitats that attract wildlife. This then reduces reliance on reactive or 'active' control methods to prevent strikes. Where attractions are identified and modification, elimination or proofing is not possible, combinations of active control will be necessary; however, habitat control should be given priority. For detailed guidance on wildlife risk management, reference should be made to some of the documents listed in paragraph 12.

13 Performance Measure

13.1 Wildlife Management at an aerodrome should be overseen and assessed every 12 months.

14 Documentation and References

- International Birdstrike Committee, *Recommended Practices No.1 Standards for Aerodrome Bird/Wildlife Control*, Issue 1, October 2006;
- Airports Council International (ACI) *Aerodrome Bird Hazard Prevention and Wildlife Management Handbook*, 2nd Edition, 2013;
- ICAO Doc 9137, Part 3 *Wildlife Control and Reduction*, 4th Edition, 2012
- ICAO Doc 9981 *Procedures for Air Navigation Services – Aerodromes*, 1st Edition, 2015.
- UK CAA CAP 772 *Wildlife Hazard Management at Aerodromes*, December 2014

15 Records

All documents are to be filed by in the appropriate organisation file.

16 Responsibilities

Senior/Aerodrome Inspector – to ensure compliance with BAR 14, 9.4.1 – 9.4.5 and general satisfaction that the Wildlife Risk is being effectively managed by the Aerodrome Operator.

Accountability for wildlife management at an aerodrome should be made clear in the Aerodrome Manual.