Safety Information Bulletin

Airworthiness – Operations

SIB No.: 2021-07

Issued: 19 April 2021

Subject: **Bird Strike Risk Mitigation in Rotorcraft Operations**

Ref. Publications:

1. Aircraft Owners and Pilots Association (AOPA) Safety Letter Bird Strike (in German) No.2 dated 02 June 2012.
2. European General Aviation Safety Team (EGAST) Leaflet GA 6 Bird Strike dated 01 May 2013.
3. Federal Aviation Administration Rotorcraft Bird Strike Working Group Recommendations to Aviation Rulemaking Advisory Committee (ARAC) dated 02 July 2019.
4. EASA Rotorcraft Together4Safety article dated 19 April 2021.

Applicability:

National Aviation Authorities (NAAs), rotorcraft manufacturers and operators.

Description:

EASA has observed an increase of bird strikes involving civil rotorcraft, elevating the risk of serious or fatal injuries to occupants and substantial damage to rotorcraft. Unlike military helicopter designs, civil helicopters have very little ballistic protection and only 10% of the EU civilian helicopter fleet have been certified with the bird strike requirement CS29.631.
Most of the EU civilian helicopter fleet is not designed to be resistant to bird strike.

Based on this observation, in 2016, EASA participated in the Rotorcraft Bird Strike Working Group which provided recommendations to the ARAC regarding the following points:

- Bird strike protection rulemaking, policy, and guidance for normal category rotorcraft.
- Evaluation of the existing bird strike protection standards for transport category rotorcraft.
- Recommendations for enhancement of rotorcraft not certified with a bird strike requirement.

As part of the recommendations, it was requested that existing non-traditional bird strike protection technology should be implemented and include safety procedures in operation.

The recommendations of this SIB for bird strike safety procedures in rotorcraft operation are the result of the ARAC Bird Strike Working Group and European civil rotorcraft operators' recommendations and best practices. The bird strike safety procedures emphasis should be on decreasing the risk of a bird strike or mitigating the results of a collision with a bird.

At this time, the safety concern described in this SIB is not considered to be an unsafe condition that would warrant Airworthiness Directive (AD) action under Regulation (EU) 748/2012, Part

21.A.3B, nor Safety Directive (SD) action under Regulation (EU) 965/2012, Annex II, ARO.GEN.135(c).

Recommendation(s):

EASA recommends the following to mitigate bird strike risk:

Safety Management System

- National Bird Societies, local ornithological clubs, NAAs experts and bird control experts from any nearby major airfields should be consulted to identify and quantify the bird threat in the operating area. This information will include the location and probability of bird concentrations, and migratory, nesting, feeding and roosting habits. Many of the bigger birds, which constitute the largest threat to aircraft and crew because of a strike, prefer certain land types for their activities. More details are given in Annex A of this SIB. NAAs and airfields should issue alert bulletins and flight service Notices to Airmen (NOTAM), and advertise those during periods of high bird activity and concentrations.
- Operators should identify and report known locations and probability of bird concentrations to their local authority, who should publish that information. The location of bird concentrations during seasonal migrations and the local bird nesting and roosting habitats should be made known to rotorcraft operators and pilots for pre-flight planning, to minimise the potential for bird strikes. Local recognition of these hazardous areas along with increased familiarity and examination of the accident/incident occurrence database to which bird strikes are reported, can provide a valuable resource for flight crews. This information should be incorporated into alert bulletins, flight service NOTAM and other systems presently used to inform flight crews about the hazards of bird concentrations.
- Infrastructure changes can have a significant impact on rotorcraft operations and local operators should be kept informed of such developments. For instance, change of land use and particularly around the introduction/removal of wetland habitats can fundamentally change the species attracted and the associated bird strike risk. Even well-intentioned changes in land use may have unintended consequences that increase the bird strike risk in other land areas.
- Training on bird strike prevention should remind flight crews that more than 3 out of 4 bird strikes occur when airspeed is greater than 80 knots. Any speed reduction will reduce the kinetic energy involved in most strikes and provide the bird with more time to avoid the aircraft.

Rotorcraft Flight Manual (RFM) Revision:

Rotorcraft manufacturers should incorporate in the RFM Normal Procedures a paragraph dedicated to “Operations in areas with high bird concentration” with the following information and caution:

> “Operating in areas with high bird concentration increases the likelihood of a bird strike when airspeed increases and height above ground level (AGL) decreases.
> CAUTION:
> Operating below 2 500 feet AGL increases the likelihood and severity of a damaging bird strike. Whenever practical, operations in this range of heights should be conducted with reduced airspeeds.”

Pre-Flight Planning

- Aircrew should plan missions at the highest level practicable and at a minimum of 2 500 feet AGL where possible, as data shows that operating rotorcraft above this height significantly reduces the likelihood of a bird strike. Research shall show any regional or seasonal migratory differences to this recommendation.
- Transits over areas of wetlands and inland water areas, such as lakes and ponds, should be avoided and, if this is not possible, the 2 500 feet AGL minimum should be aimed for.
- Coastlines should be crossed at 90 degrees to give minimum exposure to bird activity which is usually greatest on cliffs or at the waterline. Again, a minimum of 2 500 feet should be sought. Aircrew should be attentive to birds' cliff or ridge soaring.
- Night operations should be planned under consideration that bird activity is reduced at night, however the heights at which they fly tend to increase.
- Operators should collect information on the feeding and roosting habits of the indigenous and migratory birds. Many of the larger birds, for example Canada geese, like open spaces such as airfields to feed on at dawn and dusk. Therefore, routine activities like maintenance test flight, training and positioning flights should be planned outside of these time periods where possible.

In-Flight Procedures

If obliged to operate in areas of known bird concentration or near wooded areas, wetlands, water surfaces and coastlines, the following mitigations should be considered:

- If operating at low level, reduce airspeed when practical.
- Increase altitude as quickly as possible and practicable, and where other flight variables allow.
- Utilise personal protective equipment consisting of a helmet and visor, at least by the crew, when practicable.
- Use taxi and/or landing lights in a continuous mode during sunny conditions and at night, when practical. Use 2-Hz pulsed mode LED near-full-spectrum lighting during partly cloudy conditions. Pulsing lighting accentuates the speed and directional movement of the aircraft, thereby increasing aircraft recognition by the bird and decreasing the likelihood of a bird strike. Procedures and familiarisation training should be established to optimise the use of such fitted systems.
- If a bird appears to be on an exact collision course, the pilot should carry out an avoidance manoeuvre with an upward vector as most birds will break downwards once they recognise the conflict in their flight path. Care should be taken not to overstress the aircraft, and a verbal warning to other crew and passengers should be given, if possible.
- Should a bird strike be known to have occurred, or strongly suspected, it is highly recommended that the aircraft is landed as soon as practical, and full inspection carried out with the rotors stopped. Engineering advice should be sought prior to return to service.

Additional procedural recommendations that were issued by AOPA Germany and translated into English by the EGAST in Leaflet GA 6 Bird strike*: "A European risk with local specificities"* (2013), may be found on EASA website (see items 1 and 2 in Ref. Publications above).

Contact(s):

For further information contact the EASA Safety Information Section, Certification Directorate, E-mail: ADs@easa.europa.eu.

Annex A

Examples of likely large bird and land development types

All birds pose a threat to aircraft. The most common hazardous birds are the following (this list is not exhaustive):

- All wildfowl (ducks, geese and swans)
- All large waterfowl (herons, egrets, cormorants)
- Gamebirds (pheasants & partridges)
- Birds of prey
- Large waders (lapwing, curlew & golden plover)
- All gull species
- All pigeon species
- All corvid species (crow family)
- Starlings. Note these birds are not large but will be found in large flocks which increases the likelihood of a strike and the increased damage caused by multiple strikes.

The land development characteristics have an impact on the hazardous species, which it may attract, as per examples below:

Development Type	**Specific**	**Special Concerns**
Waste Management	Landfill Composting Recycling Treatment	Feeding opportunities for potentially large numbers of scavenging birds, e.g. gulls, corvids, starlings, pigeons, raptors.
Water	Nature reserves Reservoirs Ponds River diversions Sewage/Water Treatment	Diversity of feeding, loafing, breeding and roosting opportunities for waterfowl, waders & gulls, e.g. swans, geese, gulls, ducks, herons, egrets, lapwing, oystercatcher, etc.

Development Type	Specific	Special Concerns
Wetland	Nature reserves Marshland Reedbeds Swales Drainage schemes Flood alleviation Works Managed retreat	Feeding, roosting, breeding and loafing for waterfowl, passerines, and hirundinids, e.g. swans, geese, ducks, herons, egrets. Gulls, wading birds, potential for large starling or swallow roosts to form, e.g. reedbeds.
Sports Facilities	E.g. golf courses Open grasslands Watercourses Fishing lakes Sailing clubs	Landscape developments risking feeding, loafing, and breeding opportunities for different species such as Canada geese, gulls, pigeons, corvids, starlings, herons, egrets, etc.
Developments	Housing Factories Industrial Estates/Units Mineral extraction Green roofs	Diverse human factors and built environment providing food and shelter for urban species such as pigeons, gulls, corvids, starlings, etc.
Rural	Woodland Plantations Pig rearing facilities Poultry facilities	Potential feeding, nesting and cover for species such as pigeons, gulls, corvids, starlings, game birds, etc.
Energy	Solar farms Tidal barrage Energy plantations	Potential perching opportunities and feeding for raptors. Changes to waterfowl and passerines distribution.