FAA
Aviation Safety

SPECIAL AIRWORTHINESS INFORMATION BULLETIN

SAIB: AIR-21-17R1
Date: October 3, 2023

SUBJ: Rotorcraft Bird Strike Protection and Mitigation

This is information only. Recommendations aren't mandatory.

Introduction

This Special Airworthiness Information Bulletin (SAIB) provides information to help all rotorcraft owners, operators, aircrew, and passengers understand rotorcraft bird strike safety standards. This SAIB also introduces a voluntary Rotorcraft Safety Promotion Concept (RSPC) to encourage installation of safety enhancing designs, use of certain safety equipment, and adoption of operational procedures to mitigate the risk of bird strike for both Part 27 and Part 29 rotorcraft.

The FAA is revising this SAIB to update the Rotorcraft Safety Promotion Concept (RSPC) internet links that were previously listed and to update FAA contact information.

The subject matter of this SAIB does not warrant airworthiness directive (AD) action under 14 CFR Part 39. However, operating a rotorcraft with bird strike safety enhancements and following operational mitigations may reduce the probability of a bird strike occurring. Additionally, some of these recommendations may reduce the likelihood or severity of injuries and limit the damage to the rotorcraft if a bird strike occurs.

Background

Rotorcraft have a unique vulnerability to bird strike in comparison to other aircraft. Most rotorcraft flight profiles are in the low altitude environment below 3,500 feet AGL, an airspace that is the also the most densely populated with birds. In their 2017 report to the Aviation Rulemaking Advisory Committee, the Rotorcraft Bird Strike Working Group (RBSWG) cited that more than 90% of bird strikes occurred in this airspace. The outcome of a bird strike to a rotorcraft may vary from benign to catastrophic in nature, depending on variables such as the speed of the rotorcraft, the type of bird, size of bird, and the location on the rotorcraft where the bird impact occurs. A bird strike may lead to a loss of control in-flight, either through damage to a critical system component on the rotorcraft or by penetrating into the crew area and incapacitating the pilot. For a thorough explanation of the risk of bird strike to rotorcraft, the full report for the RBSWG is publicly available at: https://www.faa.gov/regulations_policies/rulemaking/committees/documents/index.cfm/search/searchResults.

On August 8, 1996, the FAA issued airworthiness standards to protect against bird strike through Amendment 29-40 of 14 CFR Part 29, section 29.631. While this safety enhancing regulation was limited in applicability to newly type certificated transport category rotorcraft, these protections can also be utilized on Part 27 and other Part 29 rotorcraft that fall outside the applicability of the regulation. This offers a particularly significant safety opportunity for Part 27 rotorcraft since they make up about 80-90% of the U.S. registered rotorcraft fleet.

A rotorcraft designed to 14 CFR 29.631 requirements increases the protection to occupants and thus reduces the likelihood of a fatal or incapacitating injury if a bird strike occurs. Some of the same safety enhancing design features that are required of newly type certificated Part 29 rotorcraft may be voluntarily pursued to increase the bird strike protection for Part 27 rotorcraft and also for the Part 29 rotorcraft that were not required to meet the regulation. There is also optional safety enhancing equipment available that offers bird strike deterrence capability that may prevent the bird strike from occurring in the first place.

Aside from design and equipment considerations, operational mitigations can reduce the likelihood of a bird strike by pilots knowing and understanding bird flight patterns and taking appropriate preemptive actions. Finally, personal protective equipment is another aspect of operational mitigation that is important in preventing occupant injury or pilot incapacitation for cases where the bird strike penetrates through the windshield.

Recommendations

The FAA recommends if you own, operate, or will occupy a seat in a rotorcraft as a pilot, aircrew, or passenger, you consider the following two options in order to minimize the potential for bird strike and maximize the protection to you if a bird strike occurs.

1. **Rotorcraft Design and Equipment Safety Enhancement Options**

The FAA is introducing a new resource, the Rotorcraft Safety Promotion Concept (RSPC), to better inform and educate stakeholders about the continuum of voluntary design and equipment safety enhancement options related to bird strike. The RSPC documents are available at: **https://www.faa.gov/aircraft/air_cert/design_approvals/rotorcraft/RSPC#birdstrike.**

The different areas on the continuum each offer a different safety benefit in terms of bird strike deterrence or protection. Stakeholders are encouraged to voluntarily use this resource to determine the design and equipment features that best fit their operational needs, available resources, and personal risk tolerances.

For stakeholders interested in the Part 29 rotorcraft that meet the bird strike protection requirements of 14 CFR 29.631, the FAA maintains a list at the same RSPC website: **https://www.faa.gov/aircraft/air_cert/design_approvals/rotorcraft/RSPC#birdstrike.**

The RSPC is intended to assist you in making an informed risk-based decision. If you are not familiar with some of the terms used to describe different areas on the RSPC continuum in this SAIB, the FAA recommends the following actions to help you to determine the bird strike design and equipment capability of a specific rotorcraft.

- **For those considering owning or leasing a rotorcraft:**
  Refer to this SAIB and ask the rotorcraft manufacturer about the bird strike protection and mitigation of their product compared to the RSPC continuum. Rotorcraft manufacturers can provide you information on available FAA approved design modifications that will improve bird strike protection and mitigation.

- **For current owners and operators:**
  Refer to this SAIB and ask your local FAA Flight Standards District Office (FSDO) about the bird strike protection and mitigation of your rotorcraft compared to the RSPC continuum. The FSDO may also connect you to an FAA Aircraft Certification Service to assist in answering this question. Rotorcraft manufacturers can also provide you information on available FAA approved design modifications that will improve bird strike protection and mitigation.

- **For pilots and aircrew:**
  Refer to this SAIB and ask your operator about the bird strike protection and mitigation of their rotorcraft compared to the RSPC continuum.

- **For passengers:**
  Refer to this SAIB and ask the operator about the bird strike protection and mitigation of their rotorcraft compared to the RSPC continuum.

- **For rotorcraft manufacturers and modifiers:**
  Refer to this SAIB and contact an FAA Aircraft Certification Serviceif you want to pursue FAA approval of design modifications that will allow your product to meet a higher level of bird strike protection and mitigation on the RSPC continuum.

2. Operational Risk Mitigation Options

Reasonable flight planning and in-flight decisions can keep the rotorcraft away from bird rich environments and help prevent bird strikes. In the event a bird strike does occur,

personal equipment is an important consideration that offers protection. Among the RBSWG's operational recommendations were the following.

- ***Learn about the local bird population and use it to plan and fly your route.*** Among the key considerations are seasonal migratory times and concentration patterns within your typical operating area.
- ***Reduce airspeed when practical.*** Three out of four bird strikes (77%) occur during airspeeds greater than 80 knots. When operating rotorcraft in areas of high bird concentrations, the likelihood of a damaging bird strike goes up as airspeed increases. When operating in these areas, fly at 80 knots or less, particularly when at lower altitudes.
- ***Increase Altitude.*** Increase altitude as quickly as possible and practical, when allowed by other flight variables. There is a 32% decrease of bird strike likelihood for every 1,000 feet gained above 500 feet AGL. Also, birds fly higher at night, so you will have to increase your altitude even more than during the day to try to avoid them.
- ***Wear Personal Protective Equipment (PPE).*** A helmet and visor, at least for the crew, should be worn when practical. This is one of the simplest acts that can improve safety in rotorcraft operations.

Reminder on Reporting Incidents

Report all wildlife strikes at https://wildlife.faa.gov/home.

For Further Information, Contact

Information on Design and Equipment Safety Mitigations and this SAIB contact:
Jorge Castillo, Manager, Product Policy Management: GA, Airplanes, Rotorcraft & Emerging Airrcraft., Policy and Standards Division, 10101 Hillwood Parkway, Fort Worth, Texas, 76177; phone: (817) 222-5110; fax: (817) 222-5961; email: jorge.r.castillo@faa.gov.

Information on Operational Mitigations contact:
Federal Aviation Administration (FAA) General Aviation and Commercial Division's, Operations Group AFS-830 at 202-267-1100.