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National Transportation Safety Board

Washington, D.C. 20594
Safety Recommendation

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In reply refer to: A-96-38 through -42

Honorable David R. Hinson
Administrator
Federal Aviation Administration
Washington, D.C. 20591

On September 22, 1995, a U.S. Air Force (USAF) E-3B Airborne Warning and Control Systems (AWACS) airplane crashed after takeoff from Elmendorf Air Force Base (AFB) in Alaska. The airplane was destroyed, and all 24 people on board were killed. The Air Force investigation determined that a flock of Canada geese had flown in front of the airplane as it became airborne and were ingested into two engines, causing both engines to lose power. Investigators found the remains of nearly three dozen birds on the runway after the accident and thousands of Canada geese residing on the airport grounds.

The National Transportation Safety Board has had a longstanding interest in the issue of bird strike hazards to aircraft and has issued wide-ranging recommendations to prevent accidents from bird strikes. For example, in 1973, the Board issued Safety Recommendation A-73-37 asking the Federal Aviation Administration (FAA) to disseminate its advisory circular entitled "Bird Hazards to Aircraft." In 1976, the Board recommended that the FAA mandate the retest of an engine model to demonstrate compliance with the bird ingestion certification criteria and improve the applicable engine certification regulations (Safety Recommendations A-76-60 and -61). Also in 1976, the Safety Board issued Safety Recommendation A-76-10 urging the FAA to establish a special program to review the operations manuals of airports certified under 14 CFR Part 139 to ensure that the provisions of the bird hazard reduction program were adequate. All of these recommendations were classified "Closed--Acceptable Action" as a result of FAA action.

While considerable government and industry attention has been focused on this issue over the last 20 years, birds continue to present a hazard to the operation of aircraft. On January 11, 1996, the Safety Board hosted a briefing on the hazards of bird ingestion into aircraft turbine engines. Participants in the briefing included representatives from the FAA, USAF, Pratt & Whitney, General Electric, Rolls-Royce, Boeing, United Airlines, Air Line Pilots Association, United States Department of Agriculture, Johns

Hopkins University, and the civil aviation regulatory authorities of Canada and the United Kingdom.

During the briefing, the FAA reported that U.S. air carriers continue to experience bird strike incidents at the rate of approximately 2,500 per year. In 1994 alone, it was estimated that bird strikes resulted in over \$100 million in damage to civilian aircraft.¹ Bird strikes continue to pose a safety risk as well. A review of the Safety Board's accident/incident data base revealed that, since 1983, there have been nine accidents and two incidents involving U.S. air carriers. (The Safety Board does not routinely investigate bird strike "incidents.") According to a Boeing data base, one-half of all high speed rejected takeoffs (RTOs) above 120 knots were performed because of bird strikes.

Discussions at the briefing also indicated that the bird population is increasing in size and weight. For example, the Canada geese population has doubled in the past 15 to 20 years. Approximately 50 percent of these birds no longer migrate, and many of them have started residing on and around many U.S. airports. Some of those birds can weigh up to 16 pounds.

Panel discussions at the briefing identified takeoff and initial climb as the phases of flight during which bird hazards pose the greatest threat. This is supported by research that concluded that over 50 percent of all bird strikes involving USAF aircraft over a 10-year period occurred on or near runways.² In addition, a 1994 Transport Canada study³ concluded that the typical bird strike occurs during takeoff or landing, and results in consequences ranging from engine fires to obscured vision, followed by RTOs or emergency landings.

The attendees at the Safety Board's briefing focused on steps that could be taken to reduce the risk of bird strikes during these flight phases. One area of discussion concerned the guidance provided to pilots regarding bird hazards in the Aeronautical Information Manual (AIM). Paragraph 7-4-2, section B, of the AIM, "Reducing Bird Strike Risks," states the following:

Engine ingestions may result in sudden loss of power or engine failure. Review engine out procedures, especially when operating from airports with known bird hazards or when operating near high bird concentrations.

¹"Bird and Other Wildlife Strikes to Civilian Aircraft in the United States, 1994." United States Department of Agriculture Report to the Federal Aviation Administration.

²"Bird Strikes - A Seasonal Danger," by Capt. Thomas Griffin, *The Mobility Forum*, January 1996, Vol 5 No. 1

³"Bird Strikes Canadian Aircraft: 1994 Summary Report," Transport Canada Environmental Services Office.

The briefing attendees suggested that this paragraph be modified to advise pilots not to take off in the presence of a known bird hazard in the runway environment, rather than to just review engine-out procedures. Based on the circumstances of the Elmendorf AFB accident, the Safety Board concurs with the suggestion and believes that the FAA should revise the wording of this paragraph to specifically address avoidance of bird hazards.

Air carrier operations are generally conducted from airports certified under 14 CFR Part 139. Section 139.337 specifies that airport officials must formulate and implement plans to alleviate or eliminate wildlife hazards to air carrier operations. These plans must include physical inspections of aircraft movement areas and establishment of communication protocol between wildlife control and air traffic control tower personnel. The FAA has published an order and advisory circular that contain information regarding wildlife hazard management plans, and these plans are evaluated by the FAA during annual airport certification reviews.

To supplement these measures, briefing attendees suggested that a series of effective "scare tactics" be developed to minimize takeoff delays when birds are near a runway. These abatement tactics may include, but are not limited to, driving a motor vehicle on the runway, activating a sound-generating device, or taxiing an aircraft on the runway. These abatement tactics should be known to pilots, air traffic controllers, and airport personnel so that they may be requested by any of these parties and executed by the proper personnel whenever takeoffs must be delayed because of bird hazards. The Safety Board concurs and believes that the FAA should develop and publish in the appropriate manuals a set of effective "scare tactic" procedures to disperse birds promptly when their presence is a hazard that results in takeoff delays.

Another area of discussion was the dissemination of bird hazard information from air traffic controllers to pilots. Section 2-1-22 of FAA Order 7110.65, "Air Traffic Control," entitled "Bird Activity Information," states that terminal controllers are to provide the following information during radio communications with pilots:

Issue advisory information on pilot-reported, tower-observed, or radar-observed and pilot-verified bird activity. Include position, species or size of birds, if known, course of flight, and altitude. Do this for at least 15 minutes after receipt of such information from pilots or from adjacent facilities unless visual observation or subsequent reports reveal the activity is no longer a factor.

While this guidance provides for a thorough description of bird activity, briefing attendees indicated that, in reality, controllers do not issue this type of detailed information in all instances during which they are aware of a bird hazard. The Safety Board concludes that dissemination of accurate bird hazard information to pilots is an

important way to combat this hazard and believes that the FAA should reiterate to controllers during annual briefings the importance of observing the procedures stated in paragraph 2-1-22 of FAA Order 7110.65.

In addition, briefing attendees pointed out that the bird hazard information available to pilots on the automated terminal information system (ATIS) recording is limited. Specific guidance to controllers in FAA Order 7110.65 does not address bird hazard ATIS alerts. In many cases, only a generic "Caution Bird Activity" warning is recorded, and the generic warning is so routinely reported that it offers little incentive for pilots to take the warning seriously. The Safety Board agrees that such warnings are insufficient and believes that the FAA should develop and issue guidance to controllers that they include specific bird hazard information, similar to that described in paragraph 2-1-22 of FAA Order 7110.65, on ATIS recordings.

Finally, paragraph 7-4-3, section B, of the AIM, states that pilots are urged to report collisions with birds using FAA Form 5200-7, "Bird Strike Incident/Ingestion Report." However, briefing attendees agreed that occurrences of bird strikes are significantly under-reported by the aviation community. One FAA-funded study concluded that as many as 85 percent of bird strikes go unreported by pilots.⁴ Briefing attendees also pointed out that maintenance personnel often discover evidence of bird strikes when performing maintenance on transport-category aircraft, but seldom report it. Accurate reports from the aviation community are essential to identify airports where additional attention should be focused to prevent a repeat of a bird strike accident like the one at Elmendorf AFB. Thus, the Safety Board believes that the FAA should issue appropriate bulletins to remind all inspectors, pilots, and maintenance personnel of the importance of reporting all bird strike incidents to the FAA.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Revise the Aeronautical Information Manual, paragraph 7-4-2, section B, to advise pilots to delay takeoff whenever a bird hazard exists in the runway environment. (Class II, Priority Action) (A-96-38)

Develop a set of "scare tactic" procedures that can be requested by pilots, air traffic controllers, and/or airport personnel and executed by the proper personnel to disperse birds near runways. Disseminate these procedures to all parties in the appropriate manuals. (Class II, Priority Action) (A-96-39)

⁴"Bird and Other Wildlife Strikes to Civilian Aircraft in the United States, 1994." United States Department of Agriculture Report to the Federal Aviation Administration.

Annually brief air traffic controllers on the importance of adhering to the guidance in paragraph 2-1-22 of FAA Order 7110.65, "Air Traffic Control," regarding the dissemination of bird hazard information to pilots. (Class II, Priority Action) (A-96-40)

Develop and issue guidance to air traffic control terminal controllers to include specific information regarding the type, size, and location of bird hazards on automatic terminal information system (ATIS) recordings. (Class II, Priority Action) (A-96-41)

Issue appropriate bulletins to urge pilots and maintenance personnel to report all bird strike incidents to the Federal Aviation Administration via FAA Form 5200-7. (Class II, Priority Action) (A-96-42)

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in these recommendations.

By:


Jim Hall
Chairman