

Bird Strike Committee Proceedings
1999 Bird Strike Committee-USA/Canada,
First Joint Annual Meeting, Vancouver, BC

University of Nebraska - Lincoln

Year 1999

Letter to the FAA regarding modified
standards for bird strike impacts

Paul F. Eschenfelder
Air Line Pilots Association, Wildlife Hazards Project Team Leader

March 11, 1999

Federal Aviation Administration
Office of the Chief Counsel
Attention: Rules Docket (AGC-200)
Docket No. FAA-1998-4815
Room 915G
800 Independence Avenue, SW.
Washington, DC 20591

IN QUALIFIED SUPPORT

Dear Sir or Madam:

The Air Line Pilots Association (ALPA), representing the safety interests of 53,000 professional airline pilots flying for 51 airlines in the United States and Canada, has reviewed the notice of proposed rulemaking (NPRM) in the referenced docket. The NPRM proposes modified standards to which engines are certified with respect to their ability to withstand impacts from birds or similar wildlife hazards. We feel the proposed standard is a step in the right direction, but cannot under any circumstances be considered attainment of a goal. As outlined below, the data used in developing the NPRM has been superseded by more accurate values for bird weight, flock size and risk of encounter. These more accurate data, and the reality of ever increasing bird populations, must be part of a program to continuously reevaluate and adjust airworthiness standards. Airport programs are decreasing and formal pilot training in wildlife hazards is nonexistent. Such deficiencies must be corrected and cannot be considered mitigating factors.

FAA Administrator Garvey recently announced that bird strikes cost the U.S. aviation industry \$327 million in damage and more than 500,000 hours of downtime each year. Dr. Todd Curtis, limiting his analysis to large jet transports only, in a study for the Bird Strike Committee-USA (enclosed), concludes that there is a 26% chance of a fatal air carrier accident caused by bird strikes by the year 2008. Given this level of damage, risk, and loss, no one can suggest that the current standards are acceptable to the industry and should be retained. ALPA concurs with the effort to improve the standards, but we feel this is only the beginning of what must become a continuous improvement process to ensure an acceptable level of safety for the traveling public as the wildlife hazard increases.

The NPRM states in part an "... assumption that current standards for airport certification will be maintained, that the historical environment will not worsen, and that airport operators and pilots will maintain at least their current awareness of the bird ingestion threat." We feel that none of these assumptions can be considered completely valid.

Many U.S. airport operators with a FAR mandate to have a wildlife mitigation plan do not have the staff or budget to implement an effective plan. FAA certification inspectors have no training

in wildlife mitigation plans nor are they required to have any. In addition, airport operators face numerous and diverse challenges to successful implementation of bird mitigation programs from non-aviation interests. In 1997 the U.S. Humane Society obtained a federal restraining order forbidding removal of Canada geese from around the Minneapolis airport area. At Kennedy airport in New York, the USDA shooting program met with large public protest, including assaults against airport personnel. The conditions on which the new standards are based have changed dramatically in the 6-15 year period since most of the data on which the proposals are based was collected. ALPA agrees with the FAA when it writes in the NPRM that "Unless the proposal addresses the actual in-service bird ingestion threat, there can be no assurance that future designs would continue to exhibit acceptable capability." Unfortunately the data detailing that actual threat is not presented in this NPRM. Current reporting standards in the U.S. are so lax that FAA Administrator Garvey, in November 1998, called on the industry to "help collect information for a national data base to help control the problem." No mandatory reporting by airport operators or aircraft operators is required and there is no incentive for reporting. The only data available through mandatory collection (from the U.S. Department of Defense and some western European governments) was not used in this NPRM. The NPRM cites two studies which ended in 1984 and 1987 and cannot account for such dramatic increases as the 230% increase in goose strikes to aircraft from 1990-1998. In a 1998 paper presented to International Bird Strike Committee (enclosed), Dr. Julian Reed of Rolls Royce argued that increasing bird populations will lead to increasing engine failures, although not in direct proportions. The NPRM does not address, nor does it make provision for, bird population growth or an increase in aviation operations. The certification standard should include a formula for increasing engine strength as bird populations and aircraft operations (and therefore risk of ingestion) increase.

The exploding wildlife populations and growth in aviation interests have lead Assistant Secretary of Agriculture Mike Dunn, who is responsible for animal damage control, to say that there has never been "...a greater chance for catastrophe than now in the conflict between wildlife and aviation interests." We find it particularly troubling that updated information on wildlife population growth is readily available from credible government studies but has not been incorporated in the development of these new standards. According to the U.S. Department of Agriculture (USDA), "No one has requested data from us (USDA) for the FAA-sponsored ARAC on engine certification." USDA also tells us there has been significant growth in bird populations in the last 10-20 years, and cites the following examples:

- The resident Canada goose population has tripled in the last decade. There are now more than 5 million of these large animals in the U.S.
- The numbers of the Great Lakes cormorant, a 4-lb. bird, increased by a factor of 900 between 1970-1997 due to improvements in the environment.
- The white pelican, a 25-lb. bird, has reached a population level of almost one million and is increasing by 3.1% every year.
- The snow goose population is so large that it is destroying its Canadian habitat.
- Gulls in the Great Lakes region are now so numerous that they have run out of nesting areas and are forced to take over building rooftops as nesting sites.

The certification standard should use the best and most current data available - not only for the number and weight of birds ingested but for the size of flocks. Recent birdstrike incidents (e.g. an American MD-80 that left 430 dead starlings on the runway and a USAirways B-737 that left more than 200 dead gulls on the runway) suggest the presumed flock sizes used to develop the NPRM may be unrealistically low. Current science supports that conclusion. Tables in the NPRM which delineate bird weights and numbers are at odds with work done by Dr. John Allan and Richard Budgery of the United Kingdom's Central Science Lab (enclosed). Their 1998 radar analysis of flocks clearly shows that, for a 100 inch engine, expected bird ingestion numbers are: for starlings - 9; for rock doves - 11; for gulls - 4; for Canada geese - 3.

The NPRM states "...data analysis has identified specific flocking bird threats up to approximately 8 lb. size (Canada goose)." ALPA questions whether this standard is reflective of the actual threat. Again based on current USDA data, the average resident (non-migratory) Canada goose today typically weighs 12 lb., with the giant species routinely weighing 15 lbs. Since bird weight is critical in testing engine strength, the disparity between actual bird weights and presumed weights must be corrected. The NPRM goes on to say "The FAA recognizes that flocking birds larger than those specified in this proposed rule may be encountered..." We feel this is a significant

understatement. Larger birds are being encountered on a daily basis. The FAA document "Wildlife Strikes to Civil Aircraft 1991-1997" notes 495 goose strikes between 1991-1997. Since the document states that less than 20% of all strikes are reported we may assume the total goose strikes are actually closer to 2,500 during this period, approximately one per day. The data from this FAA document must be incorporated into the NPRM to reflect current conditions. The hope that "...improved airport bird control methods and awareness will further address this very large bird threat..." simply ignores reality. No evidence that any improvement is occurring exists. For the last two fiscal years the FAA Technical Center has completely eliminated wildlife studies from its budget. Only after industry protest have the funds been restored and then on a limited basis. During FY99 the FAA has elected to spend only one-quarter of the moneys Congress appropriated for wildlife hazard research on that research. Improved control methods do not exist and will not be developed at current funding levels.

Pilot awareness of this hazard cannot be assumed to be satisfactory. Awareness that wildlife strikes can damage aircraft is different from understanding levels of risk, seasonal and geographic variation of the risk, and consequences presumed by current engine and airframe standards. Some pilots have taken it upon themselves to study the issue, but no U.S. air carrier currently provides training on wildlife hazards. Reliance on such "awareness" to mitigate this public safety threat is unrealistic. The certification standard should abandon the hope that such programs will somehow act as mitigation for engine ingestion events. These vague arguments have no place in a rule ensuring public safety, which should only deal in facts and science.

ALPA supports the idea of aiming the test bird at the engine's most critical point, but we see no justification for the blanket allowance of 10% tolerance for all test parameters. Since engine speed can be closely controlled during the test, a more realistic tolerance for an easily controllable parameter is 1%.

To accommodate commuter and small business jets, "...the [medium bird] criteria was modified to reflect the fact that 250 KIAS was above the normal takeoff and climb speeds for this class of aircraft..." This is no longer true. The fastest growing segment of the airline industry is the regional jet. The CL-65, EMB-145/135, and AVR-146 all routinely operate at 240-250 KIAS below 10,000 feet. Those speeds are not performance based but are imposed either by ATC restriction or by windshield limitations for birdstrikes. Normal climb speeds for these aircraft are as high as 300 KIAS above 10,000 feet. The number of operations performed by commuter and business jets still is far less than that performed by large transport aircraft. To reduce a certification standard based on performance characteristics of aircraft 20 years ago ignores the realities of the expanding regional jet fleet and is not in consonance with the Secretary of Transportation's vow of "One Level of Safety" for all of U.S. air travel.

Birdstrikes are occurring in greater numbers at altitudes higher than 1500 feet AGL, and speeds at airports are already increasing. Given that, using "...the most critical velocity between V_1 and 250 KIAS in order to cover the full range of takeoff and climb conditions..." or the compromise value of "between V_1 and the velocity reached at 1500 feet AGL" for the medium bird test is outmoded and obsolete. The FAA Air Traffic Operations Office (ATO-1) has, for more than a year, had a test program in Houston that eliminates the 250 KIAS speed limit below 10,000' and encourages climb speeds between 320-340 KIAS. A Delta B-727 participating in this program encountered snow geese at 7,000' and 280 KIAS and sustained severe damage. In spite of such incidents, the program is slated to expand to Atlanta and Memphis and is being promoted as a capacity enhancement tool and an integral part of the free flight initiative. Clearly, we can expect to see high-speed flight at low altitudes as a routine operation in the near future. The fact that the NPRM is silent on this on-going high-speed flight at low altitude hazard is unacceptable and must be corrected. For aircraft to safely operate in the future air traffic environment, it is clear that engine robustness must be increased to cope with the threats we know will exist.

For the large bird test, the NPRM proposes a 200 knot speed based on the premise that conducting the test at 250 knots *would likely* result in a relatively low blade impact vector, resulting in less than maximum bird impact forces on the blades (emphasis added). ALPA questions whether this is a fact-based conclusion or an unproved assumption. If a mass strikes an object at a speed, there is a given force. If another collision occurs with the conditions held constant except for increased speed, the force increases. If there is an element of the dynamics of the collision that serves to reduce that force, it needs to be very clearly spelled out.

We note the absence of harmonized rulemaking in regard to retention of the 4-lb. bird test. The JAA assertion that this difference leaves a void in the testing regimen has merit. To ensure the battery of tests accurately captures the range of threats and to continue in the pursuit of fully harmonized airworthiness codes, FAA and JAA should resolve this difference.

ALPA appreciates the opportunity to comment on this proposal. Although we feel the proposed standard would be an improvement over current standards, the effort falls short of establishing engine criteria that reflect the current and future picture of wildlife hazards. We urge the FAA to continue to sponsor industry groups and research efforts to improve understanding of the threat and, with that understanding, ways to counter it.

Sincerely,

Paul F. Eschenfelder
Wildlife Hazards Project Team Leader

PE:ak
Enclosures