AGING GA AIRCRAFT

By Mike Busch

The average GA airplane is now more than 35 years old. The FAA believes this represents a significant threat to safety, but most owner associations and type clubs disagree.

The FAA held its second public "summit meeting" about aging GA airplanes on March 22-23, 2006. More than 170 representatives of government, industry, owner groups and type clubs packed the meeting room in Kansas City to listen to what the FAA had to say on the subject, and to present their views and ideas to the regulators. I was one of them.

The meeting started off on a divisive note when Marv Nuss -- the aerospace engineer who heads up aging aircraft issues for the **FAA's Small Airplane Directorate** -- declared the purpose of the meeting was to address the FAA's concern that "the aging GA fleet poses an increasing threat to aviation safety," and then proceeded to repeat the word "threat" more than a dozen times in his overview.

Nuss also expressed his view that "there are some GA aircraft out there that shouldn't operate much longer." That remark didn't exactly endear him to the owner association and type club representatives whose major goal is to "keep 'em flying."

Nuss did offer some interesting statistics about the GA fleet. Of the 205,000 fixed-wing GA aircraft currently flying, less than 10,000 are certified under the FAA's Part 23 rules that require a manufacturer to perform a fatigue-life analysis. More than 80% of the fleet was certified under the old CAR 3 rules that did not take metal fatigue into account. Nuss estimated that 140,000 of them are more than 30 years old, and 25,000 are more than 50 years old.

It's also interesting to note that while turbine-powered aircraft seem to get most of the press these days, fully 90% of the GA fleet is still piston-powered. 71% are certified singles, 9% are certified twins, and 10% are experimental aircraft. Turboprops and jets account for only 3% and 4%, of the fixed-wing GA fleet, respectively.

The two big concerns about aging aircraft are fatigue cracking and corrosion. According to Nuss, nearly half of the FAA's Airworthiness Directives are related to these two factors. There has been a spate of high-profile GA accidents related to fatigue cracking and corrosion, and they involved a variety of makes and models: Air Tractor, Beech T-34, Cessna 402, Consolidated Vultee P4Y2, Grumman Mallard, North American SNJ/T-6, Piper Malibu Mirage, and Thrush.

In the past, the FAA has dealt with these problems in a reactive fashion, issuing ADs in response to accidents. Apparently, the FAA intends to change that by taking a more proactive posture, attempting to head off these problems before they occur. It seemed like every FAA employee at the meeting worked the word "proactive" into almost every sentence.

Being proactive about safety sounds like a noble goal, but the real question is how the FAA plans to go about it. Everyone seemed to agree that proactive steps to educate owners and mechanics about aging aircraft issues would be a good thing, as would initiatives to make critical maintenance-related data (SDRs, 337s, etc.) easier to obtain and search. On the other hand, most attendees felt that FAA proactivity in the form of additional regulation or special inspections or structural life-limits imposed on older aircraft could easily be the death knell for piston GA

as we know iit. After two hours of hearing perspectives from FAA and NTSB officials, it was time for various industry groups to weigh in.

AOPA: What Threat?

Luis Gutierrez, **AOPA's** Director of Regulatory and Certification Policy, offered a striking counterpoint to the FAA's perspective on aging aircraft. Gutierrez made a persuasive case that the so-called "aging aircraft threat" is actually so miniscule as to be almost negligible, and that government and industry safety efforts would be far better spent addressing other things that are far more significant threats to safety than older aircraft.

Gutierrez pointed out that the GA fleet is dominated by aircraft manufactured in the 1970s and 1980s, so the average age of the fleet has been increasing by nearly a year per year. He argued that if aging aircraft were a significant safety problem, we would expect to see the accident rates ballooning as the fleet ages. But we've actually seen the opposite: Both the total GA accident rate and the rate of maintenance- and mechanical-related accidents have been decreasing steadily over the past 20 years.

Only about 15% of GA accidents involve maintenance or mechanical causes; the remaining 85% are pilot-caused. Of the 15% involving maintenance or mechanicals, nearly half the accidents (and three-quarters of the fatal ones) are caused by engine/propeller failures that are unrelated to the age of the aircraft. In fact, the newest aircraft (five years old or less) have a high share of fatal accidents related to powerplant failure.

Structural failures due to fatigue cracking or corrosion are extremely rare. Over the past 10 years there has been an average of 3.7 such accidents per year. These represent less than 2% of mechanical-related accidents, and about 0.3% of all accidents. "You are at greater risk of dying from a heart attack than from a structural failure," said Gutierrez.

In short, structural failures in aging aircraft are among the least significant safety problems in general aviation -- perhaps *the* least significant problem. In this era of limited resources at the FAA, efforts directed at virtually any other safety problem area would have far greater impact.

"It's critically important to include owners, maintainers, and aircraft type-clubs in the process of identifying problems and solutions," said Gutierrez. "These people know the airplane the best and are frequently the most knowledgeable about cost-effective methods of preventing age-related problems."

EAA: Relax The Rules!

Earl Lawrence, **EAA's** Vice President of Government and Industry Relations, had a completely different view. He stated that EAA agrees with the FAA that metal fatigue and corrosion in older aircraft is a real issue that must be dealt with.

The primary thrust of Lawrence's presentation was that to keep older aircraft flying, we need continued availability of new replacement parts, the ability to replace obsolete parts and materials with modern equivalents, and approved data to make such installations legal. "If we cannot easily replace parts with new ones, we work to keep flying with old components that are increasingly falling victim to fatigue and corrosion," he said.

Lawrence said that the biggest impediments to keeping vintage aircraft safe are the unavailability of parts and approved data, together with the near impossibility of getting field approvals for substitution of modern parts and

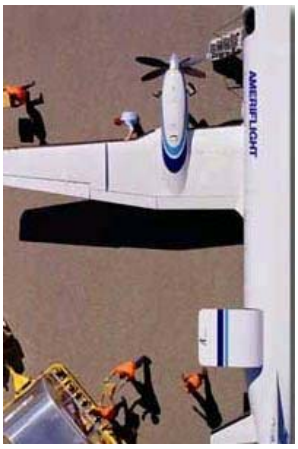
materials. These problems are most acute with "orphaned aircraft" whose type certificate holder has either disappeared or decided not to support the aircraft with parts and data.

EAA has come to the conclusion that the only way to improve the airworthiness of vintage aircraft is to change the fundamental process used to maintain those aircraft. The association is proposing that the FAA create a new "Vintage Category" with relaxed airworthiness rules.

Here's how the EAA proposal would work: The owner of a type-certificated GA aircraft could opt to transfer his type-certificated aircraft from Normal Category to the new Vintage Category. This would be a one-way transfer, and once done the aircraft could never be returned to Normal Category.

A Vintage Category aircraft would be prohibited from being used in commercial service, to carry persons or property for hire, or for aerobatics. The aircraft would still be maintained by certificated mechanics and repair stations in accordance with Part 43. But repairs and alterations could be made on the basis of "acceptable data" rather than "approved data." This could allow installation of approved aircraft parts (PMA, TSO, STC) even if those parts are not specifically approved for the particular model, and could allow substitution of materials and parts that have the same form, fit and function as the old parts.

Ameriflight: Truly High Time



John Hazlet is Director of Operations for **Ameriflight**, one of the world's largest regional air cargo carriers (a.k.a., "freight dogs"). Ameriflight operates some seriously high-time aircraft. They include a 20,000-hour Piper Lance, a 23,000-hour Cessna 402B, a 24,000-hour Piper Chieftain, a 27,000-hour Piper Navajo, a 30,000-hour Swearingen Merlin III, a 32,000-hour Beech 1900 and a 50,000-hour Beech 99. These aircraft have been worked hard for 20 to 30 years, sometimes more, and the only time they're hangared is while undergoing maintenance.

Ameriflight's experience has been that corrosion can be a problem, but that "ADs and Service Bulletins take care of most major structural problems before they become dangerous." In contrast, they've found that "fatigue is seldom a significant issue" because these older airplanes were "overbuilt" compared to recent designs.

Operations like Ameriflight demonstrate that older aircraft can be operated safely for a long, long time. Most owner-flown GA aircraft are spring chickens by comparison.

Avemco: Insuring Classics

AVEMCO INSURANCE COMPANY

Jim Lauerman, Chief Underwriting Officer of the **Avemco Insurance Company**, offered an interesting perspective on aging aircraft from the insurance industry viewpoint. Avemco insures many older GA airplanes, and has found that these aircraft (particularly high-performance models) are presenting some problems.

A primary problem is the increased incidence of landing-gear failures in older retractables. Gear-related mishaps seldom result in injury or death, but they account for a huge percentage of hull-insurance claims. Some insurers simply will not insure such aircraft, while others (like Avemco) will insure them but have had to adjust their premiums to deal with the additional risk of loss.

Companies insuring these older aircraft are also affected by the increased cost and difficulty of finding repair parts, and the fact that fewer shops can (or want to) work on these older aircraft. Another problem is the owner who cannot afford a newer high-performance aircraft, and who therefore purchases an older, less-expensive one but cannot afford to maintain it properly.

So what is the solution? "I am biased against an FAR approach to solving the problem," said Lauerman. "In my 35 years in aviation I have seldom seen a regulatory 'solution' to a problem work very well. Instead I would encourage a cooperative approach between government and industry to develop voluntary guidelines for maintaining these older aircraft, especially as they relate to avoiding catastrophic failures."

Once the guidelines were developed, insurance companies could decide if they wanted to make the standards a requirement for insurability, a rating factor, or just ignore them entirely. The aircraft owner would not be legally "forced" to adopt the standards but doing so might make financial sense.

Lauerman offers three pieces of advice to owners of older aircraft: (1) Join a good type-club that is addressing the issue of maintaining these older aircraft; (2) Document your efforts to avoid the known problems related to aging; and (3) Support the development of voluntary guidelines for maintenance.

Cessna Pilots Association: Educate The A&P/IA

John Frank, Executive Director of **Cessna Pilots Association** (CPA), chastised the FAA for its characterization of the aging GA aircraft issue as "an increasing threat to safety." He did acknowledge that there was room for improvement, and offered a number of recommendations in that regard.

Frank pointed out that all of the high-profile aging aircraft accidents that concern the FAA and NTSB involved aircraft that were operated in severe-use operations, and that had extensive structural fatigue cracking found by investigators after the accident. The accidents could have been prevented if the cracks had been found during routine inspections, but the mechanics maintaining these aircraft obviously didn't know where or how to look for them.

"This is a maintenance issue," he said, "and we have to fight it at the IA and repair-station level." To accomplish this, mechanics need better access to information about what problems to look for and how to look for them.

Frank suggested that AC43-16A (General Aviation Alerts) be put online in searchable form by make and model and that IAs and repair stations be required to perform a search as part of each annual inspection. In a similar vein, he suggested creating a database of FAA Form 337s submitted for major repairs, again searchable by make and model, allowing IAs and repair stations to research what structural issues a particular model is experiencing as it ages. IAs and repair stations should also be required to have an email address registered with the FAA, so that critical information can be disseminated to them quickly.

Frank also suggested that the FAA overhaul its Aircraft Registry to gather better data on registered aircraft, particularly with respect to time-in-service and types of usage.

Finally, Frank indicated that CPA has developed detailed inspection guidelines for the Cessna 210 and will be developing similar guidelines for other Cessna models at the rate of approximately one new model every six months. These inspection guidelines will be "living documents" that are updated annually to reflect the latest service experience from the field. Frank suggested that IAs should be required to use a type-specific inspection

checklist from a type club or other FAA-recognized source, instead of the generic checklists that most IAs use presently.

Frank pointed out that Cessna owners are quite fortunate (compared to owners of other makes) that Cessna Aircraft Company still supports its older aircraft with parts and data. However, type clubs like CPA are often more knowledgeable about maintenance and aging issues than either the manufacturer or the FAA, so it's essential that the type clubs play a major part in dealing with the problems associated with aging aircraft.

Other Type Clubs Weigh In

Neil Pobanz of the **American Bonanza Society** (ABS) discussed several ABS initiatives relevant to aging Bonanzas and Barons. These include the ABS service clinics, type-specific training courses for mechanics and technical research efforts addressing known issues (e.g., fatigue cracks in the wing carry-through structure).

Charlie Nelson of the Swift Museum Foundation offered the unique perspective of a type club devoted to 60-year-old aircraft. "We're now where you will be in 2030," Nelson told the attendees. His type club has developed both a maintenance manual and a pilot checkout manual for the Swift. Nelson indicated that his members are seeing less corrosion problems now than they did 20 years ago, "because we've been finding and treating it, not neglecting it." He said that, despite its advanced age, the Swift has experienced virtually no significant structural fatigue cracking. "Most catastrophic losses originate with the loose nut in the left seat," Nelson quipped.

Hans Neubert of the **International Comanche Society** said that 68% of the Comanches built by Piper in the 50s and 60s are still flying. Piper built these aircraft with internal zinc chromate corrosion proofing, so corrosion has not been as much of an issue as with other models. The biggest corrosion problem is with the steel stabilator torque tube, but major corrosion problems have been found in less than 2% of the Comanche fleet. There has been minor fatigue cracking in wing skins and firewalls, but most can simply be stop-drilled and they remain stable after that. According to Neubert, the biggest problems faced by Comanche owners are unavailability of replacement parts and what he called "red herring ADs."

Action Items

Following these presentations, attendees were divided up into smaller breakout sessions to identify specific issues and set up volunteer groups to begin working on them. Three dozen separate issues were identified, of which six were finally selected for further work by an ad-hoc committee of industry volunteers and FAA personnel:

1. How should we define the term "aging" as it applies to aircraft?

2. How should we address issues of operation in more aggressive fatigue spectrums (operating near the limits)? How do we determine and track the history of a specific airplane? What do we do with the data when we get it? Do we treat airplanes differently according to their usage? If so, how?

3. How should we improve quality of education/training with respect to maintenance/inspection for technicians, operators and owners on aging aircraft issues? How do we ensure that the appropriate people (owners, maintainers, etc.) take full responsibility for compliance?

4. How should we address the availability of data? Allow type clubs to develop inspection documents? Simplify field approval (repair data) process/access including 337 library? Improve availability of type design data (including orphan aircraft)?

5. How should we address the availability-of-parts issues? Streamline PMA process and improve parts/material substitution?

6. How should we improve the Service Difficulty Reports (SDR) process?

The volunteer chairman and committee members were tasked to report their progress on these issues at a follow-up meeting at EAA AirVenture in July.

Dear Mr. Busch,

First of all, we thank you for attending the FAA's Small Airplane Directorate "GA Summit," held earlier this year in Kansas City. We appreciate your reporting of the event. The sharing of information, especially to those people who could not attend, is in the full spirit of what we wanted to do. We see a safety issue, we have a concern, and we feel that together, we can jointly find a solution.

At the same time, we wish to further clarify the facts of the event to your readership. We realize the purpose of a column is often to express opinion. However, we found some of the statements in your June 7 column (**The Savvy Aviator #32: 2006 Aging GA Aircraft Summit**) need correction. For the FAA and the aviation community to effectively work together in solving aging aircraft issues, it is important that the FAA's actions and intentions be accurately represented.

An examination of the meeting transcript shows the word "threat" was indeed uttered fifteen times during the meeting, as you state, but none of them by the FAA's Marv Nuss. The word "threat" was used by a variety of people, some FAA and by some in industry, in discussing the topic at hand. In several of the fifteen instances, speakers used the word "threat" in a joking context. As for Mr. Nuss, it was printed - not stated - on two of his presentation slides.

Your column also states, "Nuss also expressed his view 'that there are some GA aircraft out there that shouldn't operate much longer,'" a statement which you noted "didn't exactly endear him to the owner association and type club representatives whose major goal is to 'keep 'em flying.'"

According to the transcript of the event, Nuss actually said, "The big question is, how do we improve general aviation safety records with an increasingly aging fleet? I believe that most of the GA fleet can operate safely for quite a while. I also believe that there are airplanes out there that shouldn't operate much longer. The tough question is which ones and when. I think we can all agree that we need to be more proactive, and the sooner we start figuring out how to do that, the safer the aging GA fleet will be."

We held this meeting so we could bring the interested parties together and work together to find a solution. We welcomed those who were able to attend, but we also feel it is imperative that those who could not attend receive accurate information so they can fully participate in the process. This is the reason we hired court reporters to record all of the presentations and plenary discussion from this very important summit. The meeting slides and a transcript order form are available **online**.

We share a concern about aging aircraft. We need to work together to find a solution. If you like, I would be happy to discuss this issue in further detail.

Sincerely,

/signed/
Kim Smith
Manager, Small Airplane Directorate

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