



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: May 12, 2005 [CORRECTED COPY]

In reply refer to: A-05-011 through A-05-013

Honorable Marion C. Blakey
Administrator
Federal Aviation Administration
Washington, D.C. 20591

The National Transportation Safety Board and others rely on the FAA *General Aviation and Air Taxi Activity (GAATA) Survey* activity estimates to calculate accident rates and statistics that form the basis for assessing general aviation safety in the United States. Congress, government agencies, the aviation industry, and other researchers frequently cite accident rates when evaluating the need for safety initiatives. Valid activity data are necessary to compare the accident rates for different aircraft types and types of operations, to establish baseline measures that can be used to identify and track accident trends, and to assess the effectiveness of safety improvement efforts. Because of a critical need for accurate activity measures, and the perception of possible problems with current general aviation activity estimates, the Safety Board analyzed the methods currently used to produce those estimates. Based on the results of that analysis, the Safety Board recommends changes to the FAA's procedures for collecting and reporting general aviation activity.

Background

The stated purpose of the *GAATA Survey* is to “monitor the general aviation fleet” so that the FAA can “anticipate and meet demand for National Airspace System (NAS) facilities and services, assess the impact of regulatory changes on the fleet, and implement measures to assure the safe operation of aircraft.”¹ However, previous Safety Board reports have cited problems with the *GAATA Survey* and the resulting activity estimates that may limit FAA's ability to carry out these monitoring tasks.

In one of these reports, *Public Aircraft Safety*,² the Safety Board identified several *GAATA Survey* data tracking problems and issued eight recommendations to the FAA and the General Services Administration to improve data collection methods and to record additional details about the purpose of flight. Several of those recommendations were specific to public aircraft operations, while others targeted survey reporting categories. However, two of those

¹ U.S. Department of Transportation, Federal Aviation Administration, *General Aviation and Air Taxi Activity Survey, Calendar Year 2002* (Washington, DC: FAA, 2004).

² National Transportation Safety Board, *Public Aircraft Safety*, Safety Study NTSB/SS-01/01 (Washington, DC: NTSB, 2001).

recommendations would improve the accuracy of all general aviation activity data if implemented.

One of these recommendations to the FAA was to improve the accuracy of flight activity data through independent verification:

Identify and implement methods independent of the General Aviation and Air Taxi Activity Survey that can be used to check the accuracy of nonairline flight hour estimates. (A-01-074)

In its response, the FAA stated that it “agrees that improvements should be made to the General Aviation, Air Taxi and Avionics Survey” and noted that as of January 2002, it had already spent a year working to identify and prioritize specific improvements as part of the *Safer Skies* initiative. A published implementation plan was promised pending resource commitments for the implementation process from the FAA, other government, and industry representatives. The current status of this recommendation is “Open—Acceptable Response.”

The other recommendation to the FAA was to improve the accuracy of the aircraft registry used to determine the size and makeup of the general aviation fleet:

Implement a program that will (a) measure and track the currency of aircraft owner contact information in the Civil Aircraft Registry and (b) systematically improve the currency of this information in a measurable way. (A-01-075)

The FAA responded that it was aware of problems with the accuracy of registry information. In January 2002, the FAA stated that it was establishing a team of legal examiners charged with improving the currency of its Civil Aircraft Registry by reviewing records of aircraft noting a sale, pending registration, or undeliverable address. The current status of this recommendation is “Open—Acceptable Response.”

Aircraft Registration

The FAA currently derives its annual estimate of general aviation activity from the number of records in the aircraft registry. However, several factors limit the potential accuracy of the registry and consequently limit the utility of the registry as a basis for estimating flight activity, including the FAA’s current triennial aircraft registration requirements, the failure of many owners to report changes of address, and corporate and shared aircraft ownership.

In June 2004, the FAA began notifying owners with out-of-date or inaccurate registrations by posting on its Web site details about aircraft registrations in danger of being canceled. The FAA also started requiring owners to include typed or printed contact information on their registrations in addition to any handwritten information, which could be illegible. The Safety Board applauds these efforts to improve the accuracy of the registry.

Activity Survey Sample

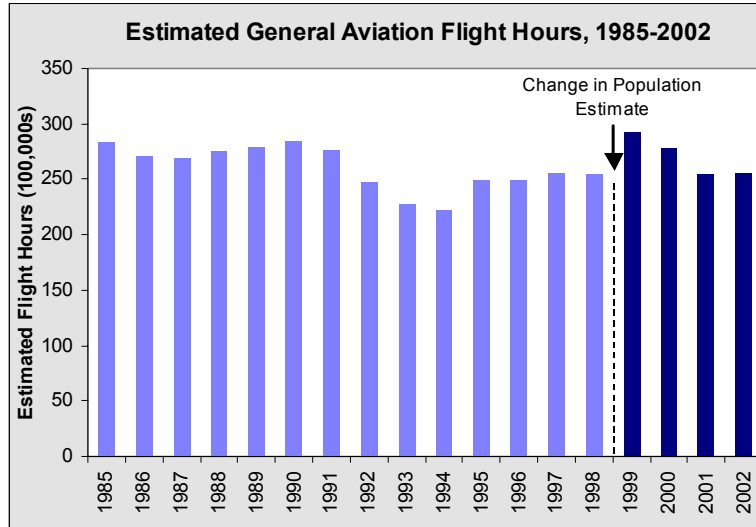
Historically, the *GAATA Survey* has excluded all aircraft reported as destroyed, registered to dealers with sale reported or registration pending, with known inaccurate owner address information, or with missing make or model information. However, in 1999, the FAA expanded the assumed population of active aircraft to include all aircraft registrations that had become invalid within the last 10 years due to inaccurate address information, a reported sale, or a pending registration. According to the methodology described in an appendix to the survey report, this change was based on the assumption that many aircraft owners continue to operate aircraft with invalid registrations. Because of this change, the *GAATA Survey* now extrapolates data from a sample of aircraft known to be active to represent an assumed population that cannot be verified. As a result of this change, the total number of aircraft used to estimate flight activity increased considerably. In 1999, the aircraft fleet increased by 20,233 records—or 8 percent—as a result of this change.³

The Safety Board concludes that the accuracy of civil aircraft flight-hour estimates currently depends on the accuracy and currency of the FAA Civil Aviation Registry. However, a triennial registration schedule and certain owner registration practices have resulted in a substantial percentage of registry records that are likely to be inaccurate. The Board therefore reiterates recommendation A-01-075 that the FAA implement a program that will (a) measure and track the currency of aircraft owner contact information in the Civil Aircraft Registry and (b) systematically improve the currency of this information in a measurable way.

General Aviation Activity Trends

Any large change in the estimated number of active aircraft has a noticeable effect on the annual general aviation activity totals, as shown in the following table. For example, the jump in total estimated hours between 1998 and 1999 was due in large part to the change in survey methodology, described above, rather than a known surge in activity.

³ U.S. Department of Transportation, Federal Aviation Administration, *General Aviation and Air Taxi Activity Survey, Calendar Year 1999*, Appendix A (Washington, DC: FAA, 2001).



Although changes in survey methodology may occasionally be required to maintain or improve data integrity or to correct specific errors, each significant change limits the survey's usefulness for accurately tracking accident rates over time. Meaningful comparisons of accident risk across multiple years require yearly accident totals to be converted to an accident rate by dividing the number of accidents by a measure of the total exposure to accident risk (in this case, total flight hours). When the FAA expanded the aircraft population, the estimated number of hours increased, and the accident rate for 1999 was the lowest on record. However, the rate decrease is questionable given that the definition of the active aircraft population was substantially different than during previous years.

Air Taxis and Fractional Ownerships

Although the current *GAATA Survey* includes data pertaining to general aviation and nonscheduled Part 135 operations, the additional operating and record-keeping requirements already placed on Part 135 air carriers, issues affecting the accuracy of activity data for these operators, and methods for improving the accuracy of those data, differ from general aviation operations. One exception is the newly created 14 CFR Part 91, Subpart K, which establishes operational and record-keeping requirements⁴ for managed fractional ownerships. As Part 91 operations, the activity of managed fractional ownerships is included in general aviation accident statistics and flight hour estimates, but the additional regulatory requirements make these operations similar to nonscheduled Part 135 air carriers.

In August 2003, before 14 CFR Part 91, Subpart K, was enacted, the Safety Board issued three recommendations to the FAA pertaining to nonscheduled Part 135 flight activity reporting. In light of the similarities between the requirements for nonscheduled Part 135 and Part 91, Subpart K, operations, two of those recommendations could be expanded to include operations governed by Part 91, Subpart K, regulations. The first was a recommendation to the FAA to require annual activity reporting by all nonscheduled Part 135 operators:

⁴ Title 14 CFR 91.1027, effective as of November 17, 2003, extends similar manifest and record-keeping requirements of nonscheduled Part 135 operations to managed fractional ownerships.

Require nonscheduled Part 135 operators to report activity data on an annual basis to include total hours flown, revenue flight hours, revenue miles flown, and number of departures by category/class of aircraft; to identify for each aircraft the proportion of flight time operations that are involved in sightseeing, air medical transport, passenger transportation, and cargo-only transportation; to report for cargo operations freight ton-miles available and freight ton-miles flown; and to report for passenger service operations seat-miles available and passenger miles flown. (A-03-037)

The second was also a recommendation to the FAA:

Develop, validate, and document an unbiased method for generating and revising activity estimates based on nonscheduled Part 135 operator surveys or reporting. (A-03-038)

In response, the FAA stated that it was reviewing these recommendations internally, with BTS, and with its Aviation Rulemaking Advisory Committee (ARAC) to determine the cost and benefits to the industry, and to understand the options for collecting and processing the data. The current status of both recommendations is “Open—Acceptable Response.”

The Safety Board concludes that the additional operational and record-keeping requirements that already exist for nonscheduled 14 CFR Part 135 and Part 91, Subpart K, flight operations allow for more comprehensive activity reporting methods than those currently used to survey the activity of noncommercial, general aviation operations. The Board therefore believes that the FAA should develop, validate, and document an unbiased method for generating and revising activity estimates based on nonscheduled 14 CFR Part 135 *and* Part 91, Subpart K, operator surveys or reporting. The Board also believes that the FAA should require Part 91, Subpart K, fractional ownership operators to report activity on an annual basis to include total hours flown, revenue flight hours flown, revenue miles flown, and number of departures by category/class of aircraft.

Comparative Data Analyses

Given the limitations and known inaccuracies in the aircraft registry information, it follows that estimates of general aviation activity based solely on these records are likely to exhibit similar accuracy problems. For that reason, the Safety Board attempted to independently verify general aviation activity estimates by comparing FAA aircraft registry and annual flight-hour estimates with other indicators of flight activity. These comparisons included the number of general aviation accidents and fatal accidents, the active pilot population, and aviation fuel consumption for the years 1985 through 2002.

The results of that analysis indicate that active pilot population totals, aviation fuel consumption, and general aviation accidents have all followed similar patterns of change annually while decreasing overall between 1985 and 2002. General aviation flight hour estimates have also decreased overall, from 28.3 million hours in 1985 to 25.5 million hours in 2002, but the pattern of annual changes in flight hour estimates has been very different than the other three

measures. The differences between these patterns have been most apparent since the mid 1990s, when activity estimates began to increase while all other indicators continued to decline. In light of the declining pilot population, decreased fuel consumption, and decreasing annual accident totals, there is little evidence to suggest a large increase in general aviation activity during this period.

Unlike the strong relationships observed between the number of active pilots, aviation fuel consumption, and accidents, no significant correlations were observed between the annual general aviation flight hour estimates reported in the *GAATA Survey* and the number of active pilots, barrels of aviation gasoline consumed, or general aviation accidents. In sum, the FAA's interdependent estimates of active aircraft and flight hours show similarity with each other, but little or no similarity to the independent measures of the active pilot population, fuel consumption, and accident totals that all display remarkably similar downward trends. These results strongly suggest that activity data derived from the *GAATA Survey* have not accurately portrayed the changes in general aviation activity during the studied period.

The easiest explanation for the lack of correlation between indirect measures of general aviation activity and the *GAATA Survey* data is that changes to survey methodology and calculation over time have resulted in data that lack the continuity necessary to make accurate year-to-year comparisons. Correlation statistics provide no indication of the accuracy of the results for a specific year, but the lack of consistency with more stable measures suggests that the periodic changes to the survey have limited its usefulness for identifying trends over time.

The decision to include noncurrent registrations in the active aircraft count beginning in 1999 is an example of how susceptible the current activity estimates are to change. Although *GAATA Survey* tables include footnotes stating that, due to changes in methodology and changes in the adjustments made to correct for response biases, estimates may not be comparable over multiple years, the same warnings are rarely extended to discussions of the apparent improvement in the general aviation accident rate calculated across those years.

An undeniable implication of these results is that because it appears likely that activity has decreased overall after 1985, the true accident risk for domestic general aviation operations has likely changed less during the studied years than *GAATA Survey* data suggest. A reduction in accidents that results from a decrease in general aviation activity cannot be counted as a safety improvement. The task of maintaining an accurate and consistent activity measure is fundamental to future attempts at identifying and reducing general aviation accident risk. The Safety Board concludes that an accurate and stable activity measure is needed to guide future attempts to portray the accident rate accurately, which is critical to formulating and evaluating general aviation safety initiatives. Therefore, the Safety Board believes that the FAA should develop, validate, and document an unbiased method for generating and revising activity estimates based on surveys or reporting of general aviation operations. The Safety Board also reiterates recommendation A-01-074 that the FAA identify measures independent of the General Aviation and Air Taxi Survey that can be used to check the accuracy of nonairline flight hour estimates.

Therefore, the National Transportation Safety Board supersedes Safety Recommendation A-03-038 to recommend that the Federal Aviation Administration:

Develop, validate, and document an unbiased method for generating and revising activity estimates based on nonscheduled 14 *Code of Federal Regulations* Part 135 and Part 91, Subpart K, operator surveys or reporting. (A-05-011)

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

Require Part 91, Subpart K, fractional ownership operators to report activity on an annual basis to include total hours flown, revenue flight hours flown, revenue miles flown, and number of departures by category/class of aircraft. (A-05-012)

Develop, validate, and document an unbiased method for generating and revising activity estimates based on surveys or reporting of general aviation operations. (A-05-013)

Finally, the National Transportation Safety Board reiterates the following recommendations to the Federal Aviation Administration:

Identify measures independent of the *General Aviation and Air Taxi Survey* that can be used to check the accuracy of nonairline flight hour estimates. (A-01-074)

Implement a program that will (a) measure and track the currency of aircraft owner contact information in the Civil Aircraft Registry and (b) systematically improve the currency of this information in a measurable way. (A-01-075)

Please refer to Safety Recommendations A-05-011 through A-05-013 and to Safety Recommendations A-01-074 and A-01-075 in your reply. If you need additional information, you may call (202) 314-6177.

Acting Chairman ROSENKER, and Members ENGLEMAN CONNERS, HEALING, and HERSMAN concurred in these recommendations.

[original signed]

By: Mark V. Rosenker
Acting Chairman