

# Improving Air Taxi Safety

BY MARK LACAGNINA

**Challenges confront efforts to better the charter aircraft accident record.**

The safety picture for the U.S. air taxi industry is muddled by the absence of activity-reporting requirements and the diversity of the on-demand operations that are conducted under Federal Aviation Regulations Part 135. There are about 2,800 air taxi operators in the United States with a fleet that

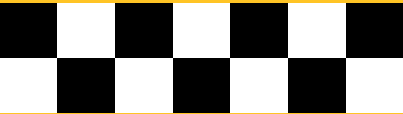
ranges from decades-old piston singles to modern large jets. Operations vary from vital bush-flying services in remote areas to long-range international flights. “Pop-up” flights requested by customers with only an hour or two of notice before their desired launch time are the bread and butter of most air taxi operators.

Among the most pressing challenges are growth and a worsening shortage of qualified personnel, especially for international operators. Air taxi operators typically have difficulty retaining experienced pilots and maintenance technicians. Some pilots fly part-time as an avocation; for full-time pilots,





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Very light jets such as the Eclipse 500 (above) are entering the air-taxi fleet, joining float-equipped airplanes such as the Turbine Otter and Beaver (left) that have been providing vital air service for years in remote areas.

air taxi typically is a steppingstone to corporate aviation or the airlines.

The most recent detailed data available from the U.S. National Transportation Safety Board (NTSB) on air carrier safety are from 2003.<sup>1</sup> That year, there were 74 air taxi accidents, including 18 fatal accidents and 42 fatalities. Nearly half of the fatalities occurred in four accidents: a Cessna 185 that struck snow-covered terrain in Alaska while transporting mountain climbers to a base camp; and three helicopters that crashed during air-tour flights — an Aero-spatale AS 350BA in Arizona’s Grand Canyon and a Bell 206B and a McDonnell Douglas 369D in Hawaii.

In 2003, two accidents occurred in scheduled Part 135, or commuter, operations. A pilot was seriously injured when his Cessna Caravan encountered turbulence in Alaska, and a Cessna 402C was ditched in the Bahamas after an engine failed, resulting in two fatalities.

For the sake of comparison, there were 54 accidents in Part 121 airline operations in 2003, including two fatal accidents with 22 fatalities.

The accident/fatal accident rates per million flight hours were 3.1/0.1 for the airlines, 6.3/3.1 for the commuters and 25.3/6.1 for the air taxis in 2003.

The airline accident rate from 1994 to 2006 remained relatively low and constant (Figure 1, p. 32). The commuter rate increased substantially in 1997 — the year in which the U.S. Federal Aviation Administration (FAA) required all scheduled operations in jet airplanes and other airplanes with 10 or more passenger seats to be conducted under Part 121 — and peaked in 1999 before beginning a general decrease.<sup>2</sup>

The air taxi accident rate decreased substantially from 1994 to 1998, then remained fairly constant, fluctuating between 20 and 25 accidents per million flight hours, before dropping to a record low of 15 accidents per million flight hours in 2006. “Throughout the period, the accident rate for on-demand Part 135 operations ... remained almost 10 times greater than the Part 121 rate, reflecting the variety of operating conditions and aircraft found in air taxi, air tour and air medical operations,” NTSB said.

### Apples-to-Kumquats

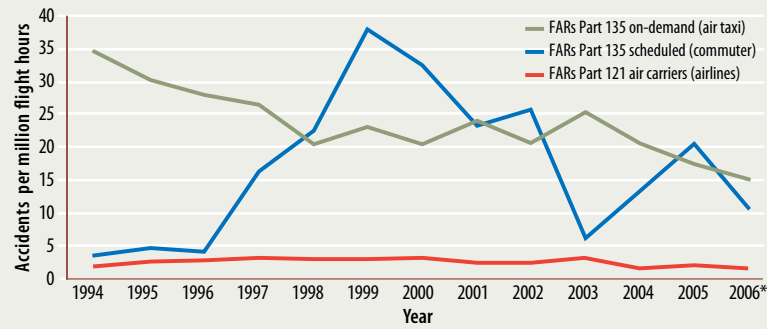
The diversity of air taxi operating conditions and aircraft is one reason a comparison of the air taxi and airline safety records is misleading. Part 121 requires airline operations to be conducted in controlled airspace and at controlled airports that have specific weather, navigational, operational and maintenance facilities. In Part 135, these requirements either do not exist or are less stringent.

Another reason to suspect comparison of the accident-rate numbers is the absence of precise air taxi activity data. Unlike airline and commuter operators, air taxi operators are not required to report their flight hours to the FAA; air taxi activity is estimated from data provided by aircraft owners who participate voluntarily in the FAA’s annual *General Aviation and Air Taxi Activity Survey*.

“The small proportion of on-demand Part 135 aircraft surveyed, combined with a sample based on aircraft owners rather than operators and low survey response rates, produces an imprecise activity estimate,” said NTSB, which advocates reporting requirements for air taxi operators.



**U.S. Air Taxi and Air Carrier Accident Rates, 1994–2006**



FARs = U.S. Federal Aviation Regulations  
 \* Data for 2006 are preliminary.  
 Source: U.S. National Transportation Safety Board

**Figure 1**

Jacqueline Rosser, executive director of the newly formed Air Charter Safety Foundation (ACSF), says that recent changes to the FAA’s survey procedures have resulted in improved activity estimates. “There has been considerable effort at the FAA to identify where those surveys should go and to ensure that every Part 135 operator is being surveyed,” she said. “It has been only a year or so since we’ve had the new process, and we are getting far better data.”

The ACSF was formed as an independent entity a year ago by the National Air Transportation Association, which represents U.S. air taxi operators. Among the initial tasks assumed by the new foundation is to derive data on the various air taxi operations. “The denominator, flight hours, for accident rate data is a tricky thing to find when you want to break down the data for jets in passenger service, piston airplanes in cargo service, and so on,” Rosser said. “We are committed to improving the data, because it is difficult to target your safety efforts when you don’t know what is going on in the industry.”

**Encouraging Trend**

The air taxi safety picture is brought into better focus with data presented by Peter Devaris, manager of the FAA’s Safety Analysis Branch, at the ACSF’s first Air Charter Safety Symposium in February. Figure 2 shows a generally steady decrease in air taxi accidents over the

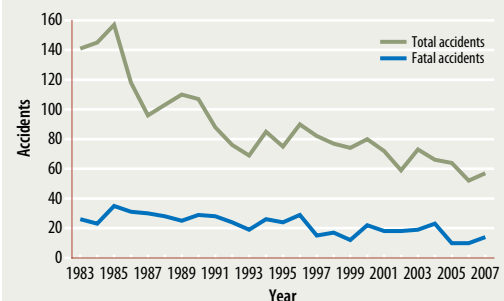
past 25 years — from a high of 157 accidents in 1985 to 52 in 2006; the total rose slightly last year.

Devaris noted that about 25 percent of the accidents occurred in Alaska, which is the largest and one of the most sparsely populated of the 50 states. With few intercity highways and railways, Alaska is extremely dependent on air transportation; yet, the state has relatively few improved airports, navigational aids and weather-reporting facilities. The terrain is rugged, weather can be extremely harsh, and most air taxi operations are conducted under visual flight rules (VFR) by single pilots in single-engine airplanes.<sup>3</sup> Efforts to improve air taxi safety in Alaska have included the Capstone Program, a joint industry/FAA effort that involved a series of technological initiatives from 1999 to 2006. Capstone has been consolidated with the FAA’s nationwide program to implement the ADS-B (automatic dependent surveillance-broadcast) system.

The leading killers in U.S. air taxi operations recently have been accidents involving loss of control in flight, controlled flight into terrain (CFIT), and runway undershoots and overshoots (Figure 3).

Data for the various types of aircraft used in air-taxi operations in 2004 to 2007 (Figure 4) show that, among fixed-wing aircraft, jets had the lowest accident rates: 0.66 accidents and 0.14 fatal accidents per 100,000 flight hours. Piston-engine airplanes had the highest total-accident rates, but

**U.S. Air Taxi Accidents, 1983–2007**



Source: Air Charter Safety Foundation, U.S. Federal Aviation Administration

**Figure 2**

their fatal accident rates were lower than the fatal accident rate for twin turboprops.

### Rewriting the Regs

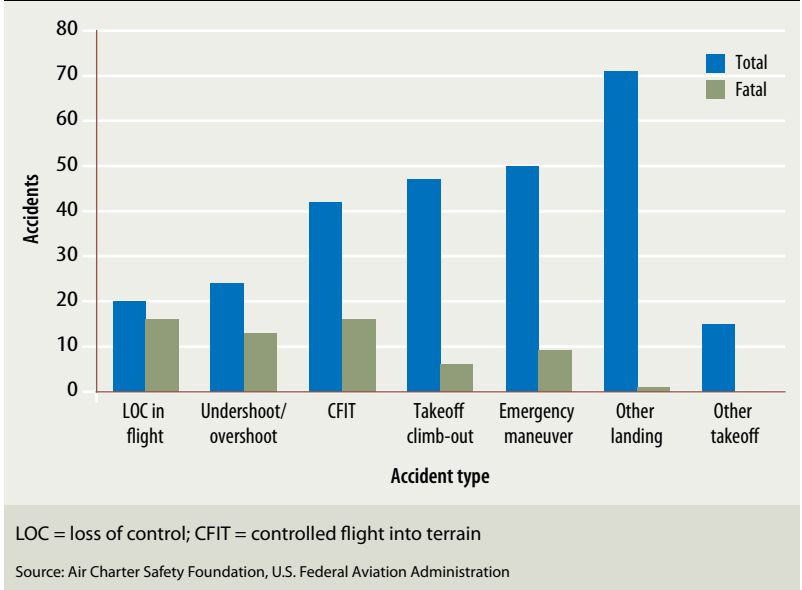
Part 135 was developed and published in the 1960s. The last substantive review of the regulations was performed in 1978; since then, there have been 40 amendments to Part 135. There is concern that the regulations have not kept pace with changes in the Part 135 fleet, which now includes large jets such as the Boeing BBJs as well as very light jets (VLJs) that are being certified for single-pilot operation under the normal category airplane standards of Part 23, rather than the transport category standards of Part 25.

In February 2003, the FAA launched a comprehensive review of both Part 135 and Part 125, which prescribes certification and operating standards for airplanes having 20 or more passenger seats or a payload capacity of 6,000 lb (2,722 kg) or more, and not engaged in “common carriage” — offering air transportation service to the public for compensation.

The Part 135/125 Aviation Rulemaking Committee (ARC) was formed to review the current rules, public comments on the rules, FAA interpretations of the rules and NTSB recommendations generated by accident/incident investigations.<sup>4</sup> More than 80 industry and FAA representatives participated on the ARC steering team and working groups that focused on aeromedical operations, airworthiness and maintenance, applicability, equipment and technology, operations, training, and the anticipated operation of airships under Part 135.

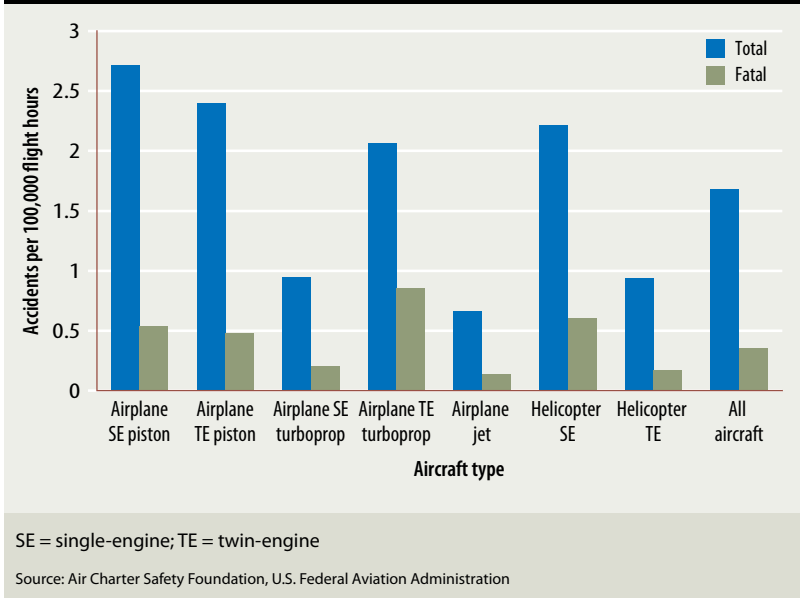
The ARC in late 2005 submitted 167 recommendations to the FAA. Several recommendations were not the result of a consensus of the working group members but were approved by a majority. An example is the ARC’s recommendations on flight time and duty time limits, a contentious issue that the FAA has been trying to solve for many years. After receiving more than 2,600 public comments to changes proposed in 1995, the FAA turned to its own Aviation Rulemaking Advisory Committee (ARAC) to sort through the comments; but the ARAC

**U.S. Air Taxi Accident Types, 2003–2007**



**Figure 3**

**U.S. Air Taxi Accident Rates by Aircraft Type, 2004–2007**



**Figure 4**

was unable to achieve consensus or gain industry support for the proposals that were generated. Industry groups also tackled the issue, with the same results.

“The difficulty over the years in revising the flight, duty and rest rules is that, in the past, the revision attempts either tried to capture all the

fractions of the Part 135 community under one rule, or the revisions attempted to apply scheduled-operation rules to an unscheduled business,” the ARC said. Neither approach was acceptable.

The majority proposal generated by the ARC is based on a scheduling scheme called the *crewmember availability method*, which would provide each pilot with a fixed eight-hour “protected period” each day and the operator with a 16-hour “availability” window in which to schedule the pilot’s 14-hour duty period. The pilot would have no obligation to the operator during the protected period, but the operator would be allowed to contact the pilot during the last hour of that period. A 10-hour rest period would be required after completion of a flight assignment. The proposal includes limits and associated compensatory rest times for flight assignments that penetrate the protected period.

A dissenting opinion said that the majority proposal would benefit operators more than pilots. “The operators are looking for more availability and ‘productivity’ from flight crews,” it said. “For flight crews, safety advocates and scientists, the question is often not whether to change the current rules but rather how much to reduce the current flight and duty limitations to enhance safety and reduce risk.” The dissenting opinion includes detailed recommendations for duty, flight and rest limitations based, in part, on time of day and type of operation.

**Helicopter EMS**

Several recommendations focused on improving the safety of helicopter emergency medical services (EMS), or aeromedical, operations. A study initiated by the FAA found that in the seven-year period ending in 2004,

there were 26 fatal EMS helicopter accidents, including 20 that occurred at night. All five of the fatal accidents that occurred in 2004 involved nighttime CFIT in helicopters that were not certified or equipped for instrument flight rules (IFR) operations and pilots who were not using night vision goggles (NVGs).

The ARC recommended regulatory changes that would allow greater use of NVGs and higher visibility and ceiling minimums for helicopter EMS operations. For example, the committee proposed that the ceiling minimum for local nighttime flights be raised from 500 to 800 ft and that the visibility minimum for helicopters or pilots not certified for IFR operations be raised from 2 to 3 mi (3 to 5 km). The National EMS Pilots Association filed a dissenting opinion, recommending that the minimums for non-IFR nighttime cross-country operations be increased to 1,500 ft and 3 mi and/or 1,000 ft and 5 mi (8 km).

The ARC also considered standards for cabin crewmembers assigned to flights that do not require a flight attendant. The committee recommended separate definitions and standards for

*cabin safety crewmembers*, who would have safety responsibilities, and *passenger service specialists*, who would not be allowed to perform safety-related functions and would not be required to receive training. A related recommendation is that the preflight passenger briefing clarify the status and responsibilities of the cabin crewmember when a cabin safety crewmember or passenger service specialist is assigned to the flight.

Among other ARC recommendations are the following:

- Require air-taxi operators to report their flight hours annually.
- Allow commuter operations in jets with fewer than nine seats. No consensus was reached on whether single-pilot operations in VLJs should be allowed.
- Increase the maximum allowable cargo payload from 7,500 lb to 18,000 lb “to provide a means for current [Part] 125 operators who are willing to accept the additional regulatory requirements to transition to [Part] 135 operation.” The proposed increase also would make it more economically feasible for Part 135 cargo

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When U.S. air-taxi regulations were adopted in the 1960s, operation of large jets with executive accommodations, such as the Boeing BBJ, was not anticipated.

operators to use former regional airliners such as the ATR 42/72, Embraer Brasilia and de Havilland Dash 8.

- Establish *qualification performance standards* — specific training and checking standards — for pilots and cabin safety crewmembers similar to those in Part 121.
- Establish specific criteria for initial and recurrent training of maintenance technicians, as well as a “single flexible maintenance standard that could be tailored to each operator.” Current maintenance requirements are different for aircraft that have nine or fewer passenger seats and for aircraft that have 10 or more passenger seats.

### Cultural Shift

The ARC recommendations have been grouped into common topics and distributed to the applicable offices at the FAA for review, according to Dennis Pratte, manager of the 135 Air Carrier Operations Branch. Each group of recommendations will go through a separate rule-making process. Pratte’s office is reviewing the first group of recommendations — those related to helicopter EMS.

“There are a lot of steps in the rule-making process,” he said. “We are still in the very early stages, but we are moving forward.” Any final action on rewriting Part 135 likely will come several years from now.

Meanwhile, the greatest opportunity for improving air taxi safety involves a cultural shift, said the ACSF’s Rosser. “The reasons why we’re having accidents are the same as they always have been,” she said. “We really do have a phenomenal safety record in this country. What takes us to the next level? We believe it is the SMS [safety management system] philosophy in which the company views not just transportation but *safe* transportation as its product.”

Noting the International Civil Aviation Organization’s adoption of safety-management standards, Rosser said that development of an SMS is particularly important for air taxi operators that conduct international flights. “It is our goal to help them do that,” she said.

In June, the ACSF will introduce a Web-based program that will assist air taxi operators in establishing and maintaining a safety event reporting and management system, which is an integral part of an SMS. “A company’s safety culture hinges on employees feeling that they can report their concerns and raise issues in a nonpunitive way,” Rosser said. “They also must believe that the events they report will be acted upon.” ●

### Notes

1. NTSB. *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 2003*. NTSB/ARC-07/01, 2007.
2. Before March 1997, commuter operations were allowed in aircraft with 30 or fewer passenger seats and with a maximum payload capacity of 7,500 lb (3,402 kg) or less.
3. Mondor, Colleen. “Among U.S. States, Alaska Has Highest Incidence of Accidents in FARs Part 135 Operations.” *Flight Safety Digest* Volume 20 (November–December 2001).
4. The ARC was tasked with determining whether Part 125 should be rescinded. The committee’s recommendation was to retain Part 125 with several proposed changes.

Facilitating instrument operation of EMS helicopters may help reduce the high rate of nighttime CFIT accidents.