BY RICK DARBY

Australian Air Charter Safety Looking Up

Accident rate still exceeded that of regular public transport, but the trend is encouraging.

Australia's celebrated aviation safety record took a "headline hit" in 2010 when an Airbus A380 en route from Singapore to Sydney suffered an uncontained engine failure on Nov. 4, with a fractured turbine disk causing structural and systems damage. While the investigation continues, the Australian Transport Safety Bureau's (ATSB's) latest analysis indicates no overall adverse trend and an improvement in the charter operations accident rate in the most recent year for which it could be calculated.[1]

In Australian air transport during 2010, accidents and serious incidents involved loss of aircraft separation, loss of control in flight, powerplant and propulsion, terrain collisions, and runway and ground operations. Among incidents in general, the most common concerned wildlife strikes, pilot failure to comply with air traffic control instructions or clearances, mechanical systems, and airframes. The data are included in a review of 10 years of occurrence statistics by the ATSB.

Among commercial air transport occurrences in the 2001–2010 study period, most occurrences were incidents.[2] "About 1 percent of all air transport occurrences were serious incidents or accidents," the report says. "On average, there were about two fatal accidents every year involving these aircraft, and they belonged mainly to the category of charter operations."

Fatal accidents per million departures in all types of commercial air transport ranged from a high of 4.0 in 2002 to 0.0 in 2004 and 2009, with departure information — and therefore rates — not yet calculated for 2010 (Table 1, p. 48). The 2009 accident rate of 9.8 per million departures was 45.6 percent of the average rate for the preceding eight years and 39.2 percent of the 2008 rate.

The period's accident rates showed a dip-rise-dip pattern, reaching their lowest point in 2009 (Figure 1, p. 48). Fatal accident rates showed no discernible trend. The accident rates for charter aircraft were about five times that for high- and low-capacity regular public transport (RPT) operations, the report says.[3]

Despite an increase in the number of incidents — some 18.5 percent more in 2010 compared with 2009 — involving high-capacity VH- (Australian)-registered RPT aircraft, the rise in departures has meant that "the rate of incidents reported has been steadily decreasing from 2006," the report says. In 2009, accidents per million departures were the lowest in the study period at 2.1 (Table 2, p. 49). That was 66 percent lower than the 6.2 per million departures in 2008, and less than half the 2001–2008 average of 4.46.

There were no fatal aviation accidents involving Australian RPT during the study period. The last was in 1975, a ground accident that occurred during pushback.

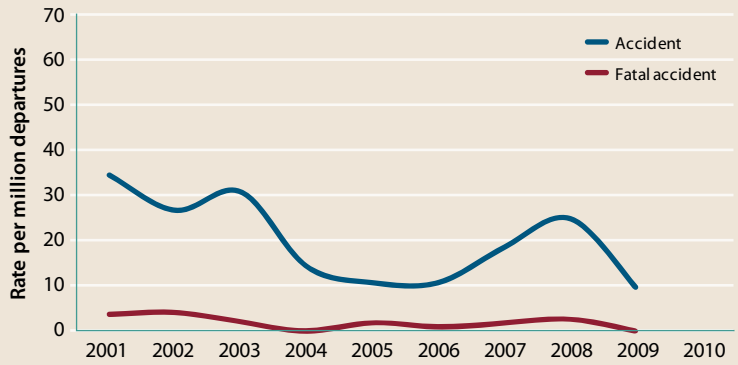
Australian Commercial Air Transport Operations, 2001–2010

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of aircraft involved										
Incidents	3,141	3,011	2,695	3,464	4,120	3,709	3,919	4,055	3,871	4,494
Serious incidents	9	10	15	30	31	16	45	47	24	33
Serious injury accidents	1	3	1	0	2	0	1	3	2	2
Fatal accidents	4	4	2	0	2	1	2	3	0	1
Total accidents	38	27	31	16	12	12	22	29	11	22
Number of people involved										
Serious injuries	4	8	4	0	2	0	1	15	3	2
Fatalities	10	12	8	0	18	2	2	6	0	2
Accident rates										
Accidents per million departures	34.6	26.8	30.9	14.4	10.8	10.8	18.6	25.0	9.8	—
Fatal accidents per million departures	3.6	4.0	2.0	0.0	1.8	0.9	1.7	2.6	0.0	—

Source: Australian Transport Safety Bureau

Table 1

Australian Commercial Air Transport Accidents, 2001–2010



Source: Australian Transport Safety Bureau

Figure 1

"The number of serious incidents increased from 2004 onwards," the report says. "This, in part, was due to a review of the ATSB's classification of immediately reportable matters, which took effect in July 2003. The number of serious incidents declined in 2009, but has risen again in 2010."

The accident rate of VH-registered aircraft operated in low-capacity RPT, which had reached zero in 2004, 2006 and 2008, rebounded to 8.1 per million departures in 2009 (Table 3). The rate had reached a high of 18.2 per million departures in 2002. The period's only fatal accidents in Australian low-capacity RPT occurred in 2005 and 2010. On March 22, 2010, an Embraer EMB-120ER crashed on a training flight, killing both pilots.

"Of all [Australian] air transport operations, charter had the highest … rate of accidents and fatal accidents per million hours and departures," the report says.[4] "The accident rate declined after 2001 until 2005, but then increased from 2006 to 2008 to levels similar to those found in 2003" (Table 4, p. 50).

In a notable reversal, the 2009 rate of charter accidents, 17.2 per million departures, was a far cry from the previous year's rate of 52.5, let alone 2001's rate of 71.3. That 2009 rate also was 41 percent of the average for 2001–2008. There were no fatal charter accidents in 2009 and 2010, compared with a 2001–2008 average of 2.1.

Non-VH-registered aircraft operating in Australian airspace had no accidents during the study period, and one serious incident in 2010, in which an Airbus A330 in instrument meteorological conditions was descended below the "radar lowest safe altitude."

In all general aviation — including Australian- and non-Australian-registered aircraft — the 2009 accident rate was 48.6 per million

departures, exactly the same as in 2008. "The accident rate was twice as large in general aviation as in commercial air transport, and the fatal accident rate was three times as large," the report says.

Emergency medical operations were a bright spot. "Of all aerial work categories with comparable rate data, accident rates per million hours for emergency medical operations were the lowest of any category," the report says. "This is in

Australian High-Capacity Regular Public Transport, 2001–2010

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of aircraft involved										
Incidents	1,732	1,776	1,478	1,976	2,392	2,184	2,244	2,457	2,408	2,854
Serious incidents	5	6	6	10	11	4	16	20	9	13
Serious injury accidents	1	1	1	0	1	0	1	1	1	2
Fatal accidents	0	0	0	0	0	0	0	0	0	0
Total accidents	3	1	1	1	1	1	3	3	1	2
Number of people involved										
Serious injuries	1	1	4	0	1	0	1	12	1	2
Fatalities	0	0	0	0	0	0	0	0	0	0
Accident Rates										
Accidents per million departures	8.8	3.2	3.1	2.6	2.5	2.4	6.9	6.2	2.1	—
Fatal accidents per million departures	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	—
Accidents per million hours	3.8	1.4	1.3	1.1	1.1	1.0	3.0	2.7	0.9	—
Fatal accidents per million hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	—

Source: Australian Transport Safety Bureau

Table 2

Australian Low-Capacity Regular Public Transport, 2001–2010

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of aircraft involved										
Incidents	750	561	579	636	691	540	606	493	470	525
Serious incidents	1	1	0	10	7	5	8	11	4	6
Serious injury accidents	0	0	0	0	0	0	0	0	0	0
Fatal accidents	0	0	0	0	1	0	0	0	0	1
Total accidents	3	4	3	0	2	0	1	0	1	1
Number of people involved										
Serious injuries	0	0	0	0	0	0	0	0	0	0
Fatalities	0	0	0	0	15	0	0	0	0	2
Accident rates										
Accidents per million departures	10.9	18.2	14.7	0.0	10.2	0.0	6.1	0.0	8.1	—
Fatal accidents per million departures	0.0	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0	—
Accidents per million hours	12.0	19.2	15.2	0.0	10.1	0.0	6.3	0.0	9.6	—
Fatal accidents per million hours	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	—

Source: Australian Transport Safety Bureau

Table 3

Australian Charter Operations, 2001–2010

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of aircraft involved										
Incidents	357	411	374	445	522	578	690	713	600	499
Serious incidents	0	1	3	9	6	6	16	13	10	14
Serious injury accidents	0	2	0	0	1	0	0	2	1	0
Fatal accidents	4	4	2	0	1	1	2	3	0	0
Total accidents	32	20	26	15	9	10	18	26	8	20
Number of people involved										
Serious injuries	3	7	0	0	1	0	0	3	2	0
Fatalities	10	12	8	0	3	2	2	6	0	0
Accident rates										
Accidents per million departures	71.3	45.2	60.2	30.4	18.8	21.1	33.2	52.5	17.2	—
Fatal accidents per million departures	8.9	9.0	4.6	0.0	2.1	2.1	3.7	6.1	0.0	—
Accidents per million hours	68.2	44.6	60.2	31.0	18.6	20.8	32.9	49.9	17.0	—
Fatal accidents per million hours	8.5	8.9	4.6	0.0	2.1	2.1	3.7	5.8	0.0	—

Source: Australian Transport Safety Bureau

Table 4

spite of the sometimes higher risks and difficulty associated with approaching and landing at unusual places." There were no fatal accidents in emergency medical operations in 2010 and none since 2003.

"The accident rate in helicopters performing any type of operation (about 97 accidents per million hours) is about 2.3 times the accident rate in airplanes performing any type of operation (about 42 accidents per million hours)," the report says. There were no RPT helicopter operations in Australia during the study period, but some helicopter charter flights. In charter flights from 2001 to 2010, helicopters had 36 accidents per million flight hours versus 39 per million flight hours for airplanes. But helicopters had the greater rate of fatal accidents: 5.6 per million flight hours for helicopters versus 3.6 per million flight hours for airplanes.

For all aircraft categories during 2010, the most frequent accident and serious incident types involved aircraft separation, aircraft control, powerplant and propulsion, miscellaneous events, terrain collisions, and ground operations events (Table 5).

The largest category, aircraft separation, included airprox and breakdown of separation.[5] The report says, "In all breakdown of separation occurrences for air transport in 2010, the separation conflict was with another aircraft rather than a vehicle on the runway. A radar standard was being used in 50 percent of [the] events, a procedural standard in about 35 percent and a runway standard in 15 percent. Fifty percent of the aircraft were on reciprocal tracks, 35 percent were on the same track and 15 percent were on crossing tracks."

Aircraft control–related serious incidents and accidents in air transport mostly involved wheels-up landings and hard landings, the report says. All wheels-up landings in 2010 were in charter operations. Two of the year's three hard landings involved helicopters.

Notes

1. ATSB. *Aviation Occurrence Statistics: 2001 to 2010.* Report AR-2011-020. March 2011. Available via the Internet at <www.atsb.gov.au/media/3428685/ar2011020.pdf>.
2. Commercial air transport is defined as "scheduled and nonscheduled commercial operations used for the purposes of transporting passengers and/or cargo for hire or reward." An occurrence is an accident or incident. Categories include the following:

   Accident — an occurrence involving an aircraft where a person dies or suffers serious injury; or the aircraft is destroyed or seriously damaged; or any property is destroyed or seriously damaged.

   Incident — an occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

   Serious incident — an incident involving circumstances indicating that an accident nearly occurred.

Australian Air Transport Accidents and Serious Incidents, by Type, 2001–2010

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Aerodrome and airways facility											
Aerodrome related	0	0	0	0	1	0	0	0	0	0	**1**
Airspace											
Aircraft separation	1	4	16	14	9	5	21	11	10	18	**109**
FTC (operational noncompliance)	1	0	1	2	3	0	5	4	3	2	**21**
ATC procedural error	1	2	1	2	4	1	3	1	0	0	**15**
VCA (airspace incursion)	0	0	0	0	0	0	1	1	1	0	**3**
Breakdown of coordination	1	0	0	0	0	0	0	0	0	1	**2**
Other	0	0	0	0	0	0	1	0	0	0	**1**
Environment											
Weather	2	1	2	3	1	0	5	6	1	2	**23**
Wildlife	4	1	0	0	0	0	2	0	0	1	**8**
Mechanical											
Powerplant/propulsion	5	8	6	9	6	7	10	17	8	10	**86**
Airframe	7	12	9	8	7	2	9	7	8	3	**72**
Systems	8	3	1	4	6	3	5	8	5	1	**44**
Operational											
Aircraft control	26	14	13	8	6	6	17	20	13	11	**134**
Miscellaneous	3	2	2	9	6	5	10	26	10	8	**81**
Terrain collisions	7	3	3	4	5	4	5	8	2	5	**46**
Runway events	0	6	6	1	2	5	6	9	1	5	**41**
Ground operations	7	2	6	2	0	2	5	4	1	5	**34**
Fuel-related	3	3	4	5	2	0	4	5	2	0	**28**
Fumes, smoke, fire	1	1	2	4	4	1	1	7	3	1	**25**
Communications	0	2	3	3	1	2	2	6	1	4	**24**
Cabin safety	1	2	0	0	3	0	4	1	0	2	**13**
Flight preparation/navigation	1	1	0	1	4	0	4	0	0	1	**12**
Regulations and SOPs	3	2	1	0	1	1	0	1	0	0	**9**
GPWS/TAWS	0	1	0	1	1	0	2	0	1	0	**6**
Aircraft loading	1	1	1	1	0	0	0	0	0	1	**5**
Consequential events	18	14	13	12	17	12	18	29	16	17	**166**

ATC = air traffic control; FTC = failure to comply; GPWS = ground proximity warning system; SOPs = standard operating procedures; TAWS = terrain awareness and warning system; VCA = violations of controlled airspace

Source: Australian Transport Bureau

Table 5

Serious injury — an injury that requires, or would usually require, admission to a hospital within seven days after the day when the injury is suffered.

3. A high-capacity RPT aircraft has a maximum capacity of greater than 38 seats or a maximum payload exceeding 4,200 kg (9,259 lb). An RPT aircraft not meeting those parameters is low-capacity.
4. Charter operations involve carrying passengers and/or cargo on nonscheduled flights.
5. An airprox is "an occurrence in which two or more aircraft come into such close proximity that a threat to the safety of the aircraft exists or may exist" in uncontrolled airspace. A breakdown of separation is "an occurrence where there is a failure to maintain a recognized separation standard (vertical, lateral or longitudinal)" while under air traffic control.