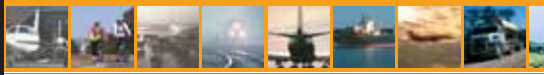
Australian Government
Australian Transport Safety Bureau

The Australian



Executive Director's Message

Reflecting on the ATSB's aviation outputs for 2005–06

The latest ATSB Annual Review covering 2005–06 was released on 29 September and is available at the ATSB website or in hard copy on request. This is a document we have produced each year since the ATSB's creation in 1999 to enhance our accountability to stakeholders.

In 2005–06 the ATSB instigated 84 investigations and released 93 final aviation occurrence and technical investigation reports. The Bureau received 7471 notifications of events classified as accidents and incidents and finished the financial year with 81 ongoing investigations.

High-profile aviation investigation reports released in 2005–06 included: the fatal Robinson R22 helicopter accident near Camden, NSW; the Piper Cheyenne accident near Benalla, Victoria; and the Piper Chieftain accident near Mount Hotham, Victoria. I noted in the last edition some of our aviation safety research and grant reports.

The ATSB also issued 22 safety recommendations including 18 formal aviation safety recommendations and four safety advisory notices. Significant aviation safety recommendations included those from the Lockhart River investigation and on Terrain Awareness Warning Systems for turbine-powered aircraft and helicopters.

Aviation safety messages continued to be well accepted, with operators, manufacturers and regulators undertaking 129 separately identified safety actions based on 45 different ATSB investigations. The ATSB itself also undertook 13 separate safety actions. Significant safety action included Airservices Australia enhanced training for controllers, upgraded software for The Australian Advanced Air Traffic System (TAAATS) and improved instructions for controllers relating to responses to route adherence monitoring alerts following the Benalla fatal accident.

The ATSB has made significant progress with the Safety Investigation Information Management System (SIIMS) aviation database replacement project which will facilitate more rigorous investigation analysis, evidence handling and project and risk management as it is rolled out within the Bureau in 2007.

Kym Bills, Executive Director

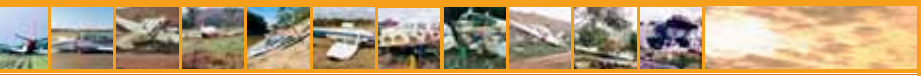
A comparison of Australian civil fatal aircraft accidents : Far North Queensland in context

This research paper examined the number and rate of fatal accidents in Australia, Queensland and Far North Queensland involving aircraft with a maximum take-off weight of 11,000 kg or less between 1990 and 2005. The latest year available for exposure data (number of landings, flying hours) was 2004. The purpose of this paper was to examine fatal accidents in Queensland, and specifically Far North Queensland, and provide a context in which to view the results.

However, the examination of fatal aircraft accidents from a regional or state perspective raised issues that limited the conclusions that could be drawn from the results. These issues included the generally independent relationship between a fatal accident's contributory factors and the accident location, the availability of suitable activity data and the low number of fatal accidents and fatalities in Australia. Hence, the results described below indicate what happened in a particular area of Australia as opposed to the level of aviation safety.

The inter-state analyses showed that between 1990 and 2005, the majority of the 318 fatal accidents involving aircraft with a MTOW of 11,000 kg or less occurred in Queensland (n = 102), NSW/ACT (n = 102) and Victoria (n = 37). In terms of fatalities, the highest number occurred in Queensland, where 225 of the 647 fatalities in Australia occurred. There were 0.9 fatal accidents and 1.9 fatalities per 100,000 landings in Queensland between 1990 and 2004, compared with the national rates of 0.7 and 1.3 respectively. Tasmania recorded the highest fatal accident and fatality rates of 1.8 and 4.1 respectively. However, the significance of these rates should be interpreted with caution due to the low number of fatal accidents and activity in Tasmania. Across Queensland, almost half the 102 fatal accidents occurred in the South region of the state with the remaining fatal accidents almost evenly distributed across the Central (n= 19), North (n = 19) and Far North Regions (n = 17). The South region of Queensland recorded the lowest fatal accident rate of all the regions, with 0.7 fatal accidents per 100,000 landings between 1990 and 2004. The Central and North regions both recorded 1.2 fatal accidents per 100,000 landings and Far North Queensland recorded a rate of 1.0.

Of the 225 fatalities in Queensland, South Queensland (83) recorded the highest number of fatalities followed by the Far North (64), North (42) and Central (36) regions between 1990 and 2005. However, South Queensland recorded the lowest fatality rate with 1.3 fatalities per 100,000 landings between 1990 and 2004. The Central, North and Far North regions recorded 2.3, 2.6 and 3.0 fatalities per 100,000 landings respectively. The Far North Queensland rate doesn't include the 15 fatalities that occurred in the Lockhart River accident in 2005, which would further increase the North Queensland fatality rate. A fluctuation in fatality numbers, such as that arising from the Lockhart River accident, highlights the influence a single aircraft accident can have when fatal accident and fatality numbers are relatively low. ■



Lockhart River Accident

Overview of Interim Factual Report

The Lockhart River fatal crash on 7 May 2005 involving Fairchild Aircraft SA227-DC Metro 23 aircraft, registered VH-TFU in which two pilots and 13 passengers died, was Australia's worst civil aviation accident since 1968. The ATSB is methodically investigating the accident, but has been hampered by the extent of destruction of the aircraft and the lack of useable cockpit voice data and of any witnesses. To date, the ATSB has issued three factual reports on the Lockhart River accident, the most recent on 31 August 2006.

The 31 August factual report provides the status of the investigation since the last report and covers additional information such as new details about the aircraft, its engines and systems including the Global Positioning System and the aircraft's airworthiness and maintenance. Additional factual information relating to wreckage and the aircraft, the flight data recorder, and a summary of survey and other research dealing with RNAV (GNSS) approaches is included.

The aircraft was being operated on an instrument flight rules (IFR) scheduled passenger service from Bamaga to Cairns with an intermediate stop at Lockhart River, Qld. At 1143:39 Eastern Standard Time, the aircraft impacted terrain about 11 km north-west of the Lockhart River Aerodrome. At the time of the accident, the crew was conducting an area navigation global navigation satellite system (RNAV (GNSS)) non-precision instrument approach to runway 12. The aircraft was destroyed by the impact forces and an intense, fuel-fed, post-impact fire. There were no survivors.

The ATSB has found that the aircraft was operating normally at the time of the accident, with no defects or malfunctions evident. Due to low cloud in the area, the crew reported conducting a runway 12 RNAV (GNSS) instrument approach. During the approach, the aircraft entered the rainforest canopy on the north-western slope of 'South Pap', a heavily timbered ridge, approximately 11 km north-west of Lockhart River Aerodrome. The aircraft was in an approximately wings-level attitude, at a flight path descent angle of about 4 degrees, with the landing gear and wing flaps extended. The aircraft began to break up immediately after entering the rainforest and destruction of the aircraft was consistent with successive impacts with trees and large boulders during the impact sequence. The flight recorder revealed that the aircraft was on the correct track, but was more than 800 ft below the prescribed lowest safe altitude for that segment of the instrument approach.

The 31 August factual report also featured the findings from a linked ATSB report on the experience and perceptions of RNAV (GNSS) approaches in Australia from pilots who are currently using these approaches. The survey found that pilot workload was perceived as being higher for the RNAV (GNSS) approach than all other approaches except the non-directional beacon (NDB) approach, which involved similar workload levels. Respondents also indicated that they perceived the RNAV (GNSS) approach as safer than an NDB approach, equivalent to a visual approach at night, but perceived it as less safe than all other approaches included in the survey. Thirty percent of respondents reported that the runway alignment of RNAV (GNSS) approaches increased safety.

As the Lockhart River investigation is ongoing, in accordance with international convention, the report does not contain any analysis or findings relating to the factual information. The analysis and findings of the investigation will be provided in the final report. The continuing investigation will include further work in the following aspects of the accident: the operator's management processes, standard operating procedures, flight crew training and checking, and document control; regulatory oversight of the operator's activities, including approvals and surveillance undertaken; and the design and chart presentation of RNAV (GNSS) approaches. Further safety action may also arise from this ongoing investigation and associated research. ■

Safety briefs

Drugs and alcohol use by pilots

Drug and alcohol use in pilots can have a detrimental impact on aviation safety. Important cognitive and psychomotor functions necessary for safe operation of an aircraft can be significantly impaired by drugs and alcohol. The purpose of this study was to determine the prevalence and nature of drug and alcohol-related accidents and incidents in Australian civil aviation. A search of the Australian Transport Safety Bureau's accident and incident database was conducted for all occurrences in which drugs or alcohol were recorded between 1 January 1975 and 31 March 2006. There were 36 drug and alcohol-related events (31 accidents and five incidents). The majority of these occurrences were related to alcohol (22 occurrences). The drugs identified included prescription drugs, over-the-counter medications and illegal drugs (including heroin and cannabis). Drug and alcohol events accounted for only 0.02 per cent of all the occurrences listed on the Australian Transport Safety Bureau's database. Drug and alcohol-related accidents accounted for 0.4 per cent of all accidents. Furthermore, 89 per cent of drug and alcohol occurrences resulted in an accident, with the proportion of these 32 occurrences that resulted in an accident quite high, at 86.5 per cent. Fatal accidents accounted for 67 per cent of all drug and alcohol occurrences. The results of this study show that the prevalence of drug and alcohol-related accidents and incidents in Australian civil aviation is very low, but that the related accident and fatality rates are high. The planned introduction of a mandatory drug and alcohol testing program into the Australian civil aviation industry will provide a more prescriptive approach to the issue of drug and alcohol use in pilots. Education and training remain important elements of an overall approach to reducing the significant impact of drug and alcohol use on flight safety. ■

Mid-air collision

Occurrence 200506443

On 10 December 2005, at about 0953, two Piper Aircraft Corp PA-28, Warrior, aircraft collided 2 km north-east of Coldstream Aerodrome.

The instructor and student on board one of the aircraft were conducting circuit training at Coldstream Aerodrome. The instructor reported that the aircraft had climbed above the nominated circuit height of 1,500 ft above mean sea level (AMSL), but was not certain of the maximum altitude their aircraft ultimately reached.

After the collision the instructor had initially considered an off airport landing; however, after some degree of control was regained he felt confident enough to return to Coldstream Aerodrome. The right wing leading edge and the vertical stabiliser of the aircraft sustained substantial damage in the collision.

The instructor and student onboard the other aircraft were returning to Lilydale Aerodrome after a period in the local training area. While transiting from the training area to Lilydale the aircraft overflew the Coldstream Aerodrome circuit area. After the collision, the instructor on board the aircraft took control of the aircraft and continued on to Lilydale Aerodrome located a short distance to the north-west. The aircraft sustained minor damage to the left wing tip, left aileron, and engine cowl and nose gear.

The local instructions for aircraft operated at Coldstream Aerodrome indicated a circuit altitude of 1,500 ft AMSL and an overfly altitude of 2,000 ft AMSL. The instructor reported that they overflew the Coldstream Aerodrome circuit area above 2,000 ft AMSL, which was consistent with the unverified radar data.

Following the collision, the instructor pilots landed their aircraft safely and none of the pilots were injured. ■

Tail strike on takeoff

Occurrence 200500382

On 1 February 2005, a Boeing Company 737-838 (737) was being operated on a scheduled passenger service from Sydney, NSW, to Darwin, NT with two pilots, five cabin crew and 151 passengers. The pilot in command (PIC) was the pilot flying for the take-off. At 1931 Eastern Daylight-saving Time, during lift-off from runway 34 Left (34L), in gusty crosswind conditions, the PIC and copilot felt the aircraft's tail strike the runway. They queried the rear cabin crew, who confirmed that there was an unusual noise during the aircraft's rotation. The pilots performed the 737 *Quick Reference Handbook* (QRH) Non-Normal Checklist for tail strike on takeoff. Following completion of the checklist, the PIC elected to return to Sydney for an overweight landing. An engineering inspection confirmed that the aircraft had sustained a tail strike during the takeoff. A crushable cartridge, fitted to minimise damage to the aircraft during a tail strike, was damaged and required replacement.

The investigation found that while the PIC needed to react quickly and precisely to manage roll in the gusty crosswind conditions, a more measured input of pitch control was required during the aircraft's rotation to maintain the allowable tail clearance margin. This occurrence highlights that during a take-off manoeuvre, tail clearance margins can reduce to the point where a tail strike will probably occur if the recommended rotation rate is exceeded.

On the 25 January 2006, the operator advised the Australian Transport Safety Bureau they had developed a New Technologies training segment effective 18 January 2006. That training includes the use of the Heading Guidance System (HGS) on the Boeing 737 which will enhance situational awareness during takeoff and landing. ■

Engine failure

Occurrence 200507077

On 25 June 2004, the Australian Transport Safety Bureau (ATSB) released its final investigation report into an accident which occurred on 27 November 2001 at Toowoomba aerodrome, Qld, involving a Beech Aircraft Corporation King Air C90 aircraft, registered VH-LQH, which experienced an engine failure shortly after takeoff. The aircraft was destroyed and all four occupants sustained fatal injuries.

The report (200105618) including ATSB recommendations is available on the ATSB website (www.atsb.gov.au). The factors which contributed to this accident were primarily maintenance-related. Since the accident, CASA has made changes to the requirements of AD/ENG/5 and to the processes for assessing the suitability of maintenance controllers.

In September 2005, a coronial inquiry into the accident was commenced. During that inquiry, new information was brought to the attention of the ATSB. As a result of this new information, the ATSB formally reopened the investigation on 11 November 2005 in accordance with Paragraph 5.13 of Annex 13 to the Chicago Convention through Section 17 of the *Transport Safety Investigation Act 2003*, to assess the matters raised and their significance to the original ATSB investigationfindings.

As part of the reopened investigation, the ATSB's principal failure analyst was requested to review and comment on the evidence and analysis relating to the primary failure event for the left engine. The Transportation Safety Board of Canada (TSB) was also requested to review its original analysis. In light of a further review of the evidence, the ATSB has reconsidered its original finding that the initiating event of the engine failure of VH-LQH was a blade release in the compressor turbine and proposes that an alternative possibility could have been that the initiating event occurred in the power turbine. Notwithstanding this possibility, in either scenario, the remainder of the findings and safety recommendations contained in the original ATSB report are still relevant. ■

Runway excursion

Occurrence 200602199

On 27 April 2006 at about 1530 Eastern Standard Time, a Cessna Aircraft Company U206G (206) aircraft was being operated on a non-scheduled passenger flight from Warraber Island to Mabuiag Island, in Torres Strait. On board were a pilot, six passengers and luggage. Shortly after touchdown during the landing on runway 15 at Mabuiag Island, the aircraft commenced to veer to the left. The pilot was unable to maintain the aircraft on the runway and it continued to veer left, skidding sideways on the grass verge through a fence and into a lagoon. The pilot and passengers were able to safely vacate the aircraft.

The pilot reported that the aircraft was configured with full flap for the approach and that the aircraft touched down at about 65 kts near the runway threshold. He retracted the flaps on touchdown and as he applied maximum braking, the aircraft turned to the left and started to skid. He applied gentle right rudder in an attempt to straighten the aircraft, but it continued to slide to the left. The aircraft ran off the sealed runway surface and it continued to slide on the grass.

The operator reported that an inspection of the aircraft following its recovery from the lagoon did not reveal any mechanical or system anomalies that may have been a factor in the accident.

The pilot reported that he probably did not apply equal braking effort to both the left and right main landing gear brakes during the landing. While the braking technique may have been a factor, it is more likely that the pilot's limited experience in crosswind conditions and on the aircraft types were the main factors that led to the runway excursion. ■

Near collision on ground

Occurrence 200506646

At approximately 2200 Eastern Daylight-saving Time on 15 December 2005, the pilot of a Piper PA-31-350 Chieftain aircraft, registered VH-HJS, was approaching Bankstown Airport to land on Runway 11. Following touchdown, the pilot of the Chieftain noticed another aircraft on the right side of the runway and took avoiding action by manoeuvring to the left, off the runway sealed surface and on to the grass, to prevent a collision. The pilot of the Chieftain reported that the other aircraft appeared to have only a dim tail light on at the time.

Subsequently, the other aircraft was identified as a Piper PA-28-151 Cherokee aircraft, registered VH-LMY. The pilot of the Cherokee had completed a number of night circuits at Bankstown and reported that he was taxiing on runway 11 following a full stop landing.

At the time of the incident, Bankstown Airport was operating as a Common Traffic Advisory Frequency (R) (CTAF – radio required to be carried and used).

The Australian Transport Safety Bureau reviewed the recorded frequency channels for the Bankstown CTAF (R). The recordings indicated that the pilot of the Chieftain had broadcast his intentions on the Bankstown CTAF (R) during the approach. In addition, transmissions from other traffic and the Bankstown Aerodrome Frequency Response Unit (AFRU) were recorded.

However, there were no recorded transmissions from the pilot of the Cherokee on the Bankstown CTAF (R).

As a result of this occurrence, the Civil Aviation Safety Authority (CASA) has advised the Australian Transport Safety Bureau that they intend to take the following actions:

CASA will consider whether 'beep back' equipment should be mandated for all Common Air Traffic Advisory Frequency (CTAF) and CTAF (R) aerodromes and whether a full tower service when night circuit training is taking place should also be mandated, especially during ab-initio circuit training by solo students. ■