



Australian Government

Australian Transport Safety Bureau

The Australian



Executive Director's Message

On 17 August, the Queensland State Coroner released his report on the 15-fatality Lockhart River accident. After so much work, it was pleasing that he found the ATSB's report 'of great assistance' and 'thorough and competently carried out'. He agreed that the accident was the result of controlled flight into terrain after Transair's pilot-in-command flew the approach dangerously after losing situational awareness in cloud. However, the Coroner did not accept that 'the crash started and ended in the cockpit' and other key ATSB findings relating to broader contributing safety factors were therefore supported.

While the Coroner was supportive of the ATSB's broad methodology, some issues were raised about the difference between the ATSB's tests for significance at each part of the accident chain and the legal methodology used by lawyers and Coroners based on overall causality. Because of the importance of clarity and mutual understanding of methodologies used and any reasons for legitimate differences in future safety investigations and inquests, I have commissioned a paper as a basis for discussion with coroners that is intended to be published on the ATSB website in due course.

The ATSB's Aviation Safety Research programme is underway for the 2007-08 financial year and aims to produce at least 10 research publications on matters of interest across the spectrum of the aviation community.

Controlled flight into terrain (CFIT) accidents persists as one of the great global challenges in aviation. Although not as common as some types of accident, CFIT tend to result in fatal injury to the crew and occupants. The ATSB safety research team has been examining CFIT accidents in Australia over the last decade, and will soon release a report that provides some useful insights about these kinds of accidents, as well as taking a look at the way new technologies are reducing the risk of CFIT.

The Robinson R22 is the world's most popular make of piston engine helicopter. In Australia they are a favoured tool by the aerial stock mustering industry, although this type of operation was not considered as part of the helicopter's original certification process. The ATSB study will be released soon, examining the stresses applied to an R22 engaged in aerial mustering.

Spatial disorientation continues to challenge pilots of all experience levels. Spatial disorientation can occur for a variety of reasons, and recognising the symptoms quickly is one of the best ways of combating its insidious effects. A report on disorientation, authored by aviation medicine specialist Dr David Newman, will also be published during this financial year.

I encourage you to take the time to visit the ATSB website and acquaint yourself with the latest studies and investigation reports. Future safety depends on how well we learn and are mindful of the lessons of the past.

Kym Bills, Executive Director

Amateur-built (Experimental) Aircraft Survey

Over the years, the general aviation sector has changed in response to external forces. In the late 1970s the production of single engine piston aircraft was at its peak, led by US manufactures including Cessna, Piper, Mooney and Beech. But by the early 1980s, production had slowed dramatically. The market was adjusting to an oversupply of new airframes in the years before, and also to the increasingly hefty costs caused by litigation in the US. As a major consumer of American aircraft, Australia was not spared the consequences. Prices rose as output fell. Today the piston engine fleet has an average age of about 30 years, and some popular models ceased production two decades ago.

General aviation continues to change. One area that has experienced an extraordinary takeoff in growth over the last few years is the Amateur-built aircraft market.



Photo courtesy of Martin Hone

An Amateur-built (ABE) aircraft is one for which the major portion (at least 51%) of the aircraft is assembled and fabricated by the person undertaking the project. In 1998, changes to the Civil Aviation Safety Regulations, added the new Special Certificate of Airworthiness (C of A), Experimental Category to the Amateur Built Aircraft Acceptance C of A. The last decade

has seen a growing number of people use the Experimental Category to build their aircraft. More new aircraft entering the Australian register are this category, rather than the traditional certified types.

This growth in ABE aircraft popularity and a number of recent Australian accidents have prompted the Australian Transport Safety Bureau (ATSB) to take a closer look at the operations of ABE aircraft. Very little research has been performed in this area, and two small studies conducted in the United States are now several years old. A preliminary study by the ATSB found ABE aircraft accident rates have been higher than for certified aircraft, but with encouraging signs that safety has improved in recent years.

The ATSB is inviting owners of flying ABE aircraft to participate in a survey in the last quarter of 2007. This survey will give owners of these aircraft the opportunity to tell the ATSB about their experiences and generate a better informed and more useful study than would be the case using dry statistics alone. ABE aircraft owners will be sent a letter, inviting them to complete a confidential survey online through the ATSB website, or in hard-copy. The survey will take only about 10 minutes to complete. Contributions from owners and operators of these aircraft are vital to developing an accurate picture of safety trends affecting ABE aircraft. For more information, please phone the ATSB on 1800 621 372, or visit the ATSB website. ■

Aviation Safety Investigator



New training for Safer Australian Skies

Safety in Australian skies will be enhanced through a new aviation ‘threat and error management’ (TEM) training course for passenger and general aviation operations, which is being delivered around Australia from 24 August 2007. A couple of years ago the Australian Government, through the Australian Transport Safety Bureau (ATSB), contributed \$250,000 to enable the Australian Regional Office of the Guild of Air Pilots and Navigators (GAPAN) to develop a course for improving safety threat and error management skills in the Australian aviation sector.

The course is now being offered to Check and Training pilots and flight instructors at key locations around Australia through travelling workshops to ‘train the trainers’. This will give the greatest opportunity to spread the knowledge throughout key aviation sectors. The Executive Director of the ATSB, Kym Bills, and the Chairman of the Australian region of GAPAN, John Whittington launched the course on 20 August 2007 after a media announcement by Deputy Prime Minister and Minister for Transport and Regional Services the Hon Mark Vaile and it has been delivered by GAPAN around Australia from 24 August 2007.

The course methodology has been developed from a threat and error management model based on the findings of a long-running research project on airline crew performance by the University of Texas. This TEM course will help pilots with early identification and effective management of the threats and errors encountered during flight.

The University of Texas’s research assessed the results from Line Operations

Safety Audits (LOSA), which use trained observers in aircraft cockpits during normal operations in order to evaluate in-flight crew performance. The audit observers monitored the threats and errors encountered by aircrew, and how they managed such situations to maintain safety.



Mr Kym Bills, Executive Director, Australian Transport Safety Bureau with Mr Patrick Murray, Group General Manager, Air Transport Operations Group, Civil Aviation Safety Authority at the launch of the Threat and Error Management training course.

“The International Civil Aviation Organization (ICAO) defines Threat and Error Management as ‘The development of countermeasures to human performance vulnerabilities in flight deck or cockpit operations.’” explained Bill McIntyre, GAPAN’s Education and Training Chairman and Project Manager for the TEM Programme. “TEM therefore is an approach to flying that seeks to equip

the pilot with the skills to recognise and counter everyday problems which, if ignored, will result in accidents or incidents.”

GAPAN Regional Chairman John Whittington stated “The intent of this programme is to introduce Australian pilots to TEM and to provide a platform that will assist pilots to understand the first principles and practices of TEM before his or her first solo, and then continue to build on these skills all the way through to the ATPL level. GAPAN recognises that pilots who could develop a proactive strategy to manage threats would improve their chances of avoiding the errors that commonly result from mismanaged threats.”

Glenn Elms, GAPAN’s Technical and Air Safety Director said that “After many years research into human factors, and from the many documented histories of threats, errors and undesired aircraft states in both the LOSA database and ATSB archives, the University of Texas defined a framework for airmanship – now known as the threat and error management model. With this work, they’ve enabled us to bring Airmanship training into the 21st century. “It is now an International aviation requirement by ICAO for all pilots to be trained in Threat and Error Management (TEM). GAPAN also understands that CASA will shortly legislate TEM as a requirement for Australian pilots with the introduction of Civil Aviation Safety Regulation Part 61.”

Details are available on the GAPAN website, <www.gapan.org.au> or via email tem@gapan.org.au ■

Safety briefs

Icing event

Occurrence 200500860

On 10 February 2005, a de-Havilland Canada Dash 8-315 aircraft, registered VH-SBI, was enroute from Gladstone to Brisbane Airport, Qld, on a regular public transport service. The aircraft was operating in instrument meteorological conditions and had accumulated ice on the airframe, wings, and propellers.

During the climb out of Gladstone, the anti-ice and de-icing equipment were selected ON in response to the inclement weather. While in the cruise at flight level 210, air traffic control (ATC) instructed the crew to set course Maleny time 24. The flight crew acknowledged ATC and reduced power, in order to comply with the instruction.

When the flight crew reduced speed, they noticed a number of indications that they suspected were as a result of ice accretion. After initially increasing power, the crew again reduced power in response to an engine temperature warning. That power reduction was accompanied by the activation of the aircrafts stick shaker warning. The crew recovered the aircraft and landed at Brisbane without further incident.

Following a company investigation, the operator provided additional training for the flight crew and amended the company operations manual to specifically address the minimum speeds for operations in and out of icing conditions.

As a result of this incident, the operator has undertaken two main safety actions. The crew received specific simulator exercises to explore minimum airspeeds in response to ATC or other holding requirements, both in and out of icing conditions. The operator's Dash 8 operations manual was amended to specifically address minimum speeds associated with operations in and out of icing conditions. ■

Below minima landing

Occurrence 200605473

On 16 September 2006 at 0038 WST, an Airbus Industrie A330 landed on runway 21 at Perth Airport in weather conditions below the applicable landing minima. The aircraft, registered VH-QPJ, was being operated in accordance with the instrument flight rules (IFR) on a scheduled passenger flight from Singapore to Perth, WA.

Before departure from Singapore, the aerodrome forecast (TAF) for Perth Airport predicted a 30% probability of fog after 0200. The aircraft was due at Perth at 0020 so in accordance with the operator's fuel policy; fuel was not specifically carried for a diversion to an alternate aerodrome. While the aircraft was in cruise, the TAF was revised to forecast fog from 2400, but the trend type forecasts (TTF) which superseded the TAF trended fog from 0030.

At about 2350, when the flight crew commenced descent, the aircraft passed the point where it had the fuel to divert to Learmonth, WA. About 10 minutes later, the TTF was amended to forecast fog to occur before the aircraft's arrival time. The fog occurred at about 0015. The crew attempted two Instrument Landing System (ILS) approaches before they used autoland to land on runway 21 in weather conditions that were below the prescribed landing minima for the ILS.

The ILS at Perth (and other Australian airports) was approved to the Category I standard that did not allow landings where the visibility was less than 800 m. The Perth runway 21 ILS glide path critical area was not fully protected from multipath effects during low visibility operations.

Perth and Learmonth were the only aerodromes in Western Australia that could be classified as suitable for the A330, and Learmonth was 599 NM (1,110 km) from Perth. As a result of this occurrence, the operator implemented an interim flight planning fuel policy specifically for Perth. ■

Runway incursion

Occurrence 200602099

On 21 April 2006, a Brisbane Airport surface movement controller (SMC) issued a clearance for the driver of an aircraft tow vehicle to cross an active runway in front of a Boeing Company 737 aircraft which had been lined-up on the runway ready for departure. The crew of the 737 aircraft had been issued with a take-off clearance by the aerodrome controller (ADC) and subsequently commenced takeoff. The SMC and ADC services were being provided on separate radio frequencies.

The crew of the tow vehicle later reported that they were still within the runway strip when the 737 aircraft passed behind them airborne. The flight crew of the 737 had observed the tow vehicle crossing the runway during the take-off roll, but had assessed that the vehicle would be clear of the runway prior to them reaching its observed position and decided to continue the take-off. The SMC later reported that he had wrongly believed that he had coordinated and received a clearance for the tug to cross the runway from the ADC.

As a result of this occurrence Airservices Australia has made changes to the coordination of runway crossing clearances, including the content, form and readback requirements and has mandated the use of movement strips for the SMC position at Brisbane. It reported that it has continued with efforts to reduce the number or required runway crossings, in consultation with the airport owner and is also in the early stages of a project to procure an Advanced Surface Movement Guidance System (A-SMGCS). Airservices Australia is also actively considering and pursuing the concept of having all runway crossings occurring on the ADC frequency as recommended by the International Civil Aviation Organization. ■

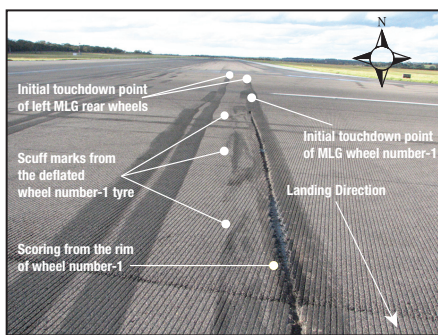
Crosswind landing event

Occurrence 200505311

At 1200 Eastern Standard Time on 26 October 2005, the outboard bead heel of the number-1 wheel tyre on the left main landing gear (MLG) of an Airbus A340-642 (A340) aircraft, registered HS-TNA, separated from the outboard rim of the wheel assembly during a landing on runway 16 at Melbourne Airport, Vic. The landing was conducted during gusting crosswind conditions.

The number-1 wheel tyre deflated immediately after the bead heel separated from the wheel rim. The tyre then partially disintegrated during the remainder of the landing roll, and the tyre tread detached from the tyre casing. Following the number-1 wheel tyre deflation, the crew maintained control of the aircraft and, apart from some minor deviations to the left and right of the runway centreline, tracked along the centreline.

The aircraft touched down with 15-degrees of yaw as a result of its handling by the flight crew. That yaw angle was greater than recommended by the aircraft manufacturer, and increased the risk of damage to the MLG at touchdown. It also increased the risk that the resultant groundslip angle of the MLG tyres would exceed the saturation point at which they entered a fully-skidded state.

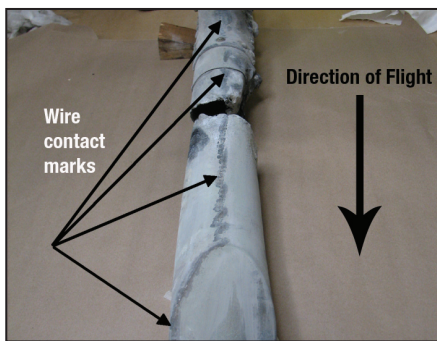


The pilot in command made dual side stick inputs during the latter stages of the approach intending to assist the copilot to maintain the attitude and trajectory of the aircraft. Those dual inputs compounded the handling difficulties being experienced by the copilot and increased the associated risks. Those risks could have been mitigated by the pilot in command taking control of the aircraft and pressing the side stick priority pushbutton at the point where he appeared to have become concerned about its attitude and trajectory, instead of making dual side stick inputs. ■

Wirestrike

Occurrence 200600523

On 2 February 2006, a Bell Helicopter Co 206B (III), registered VH-MFI arrived at Parkes Aerodrome from Dubbo, NSW in preparation for an aerial noxious weeds survey, including the requirement for a closer inspection of the eastern border area of the Parkes Shire Council. At an estimated 0923 Eastern Daylight-saving time, the pilot took off for the estimated 7 to 8 minutes flight to the survey area. Also onboard the helicopter were two council weeds control officers.



Witness reports indicated that, at about 0930, the helicopter struck a powerline that crossed the Parkes to Orange road.

The occupants of the helicopter were fatally injured and the helicopter was destroyed by impact forces and a post-impact, fuel-fed fire. There was no damage to the powerline or associated facilities and structures.

As a result of this investigation, the Civil Aviation Safety Authority (CASA) indicated that it was considering the development of a Civil Aviation Order (CAO) with the effect that anyone carrying out low-level operations would have to satisfy relevant low-level flying standards.

The Australian Transport Safety Bureau (ATSB) issued two recommendations as a result of this investigation, including: the possible enhancement of the content of CASAs *Approval to conduct Low-flying Instruments* and the possible development of a Civil Aviation Advisory Publication or Advisory Circular for application in the conduct of low-level operations. In addition, the ATSB has commenced initial discussions with a number of agencies and associations in order to examine the feasibility of the establishment of a national database of information on the location of known powerlines and tall structures for access by pilots, operators and managers of aerial campaigns. ■

APU event

Occurrence 200605999

On 11 October 2006, at approximately 1420 Central Standard Time, a Boeing Co 767-336 was departing from bay 3 at Darwin Airport, NT for Brisbane Airport, Qld. Just prior to taxi, an auxiliary power unit (APU) fire warning activated with associated indications. The crew carried out the APU FIRE checklist items and the APU fire warning message extinguished and the aural APU fire warning ceased.

Company engineering and Aviation Rescue and Fire Fighting (ARFF) personnel performed an external visual inspection of the APU area and advised the crew that there were no signs of a fire from the APU. The aircraft was returned to the departure gate.

The aircraft was returned to service under the provision of the B767 minimum equipment list item applicable for the operation of the aircraft with an inoperative APU.

During overnight maintenance in Sydney, company engineering staff found the remnants of a significantly-charred cloth rag located on top of the aircraft's APU.

A number of safety actions were carried out or proposed by the operator as a result of this incident, including amendments to the maintenance documentation for clearance closure inspections and action to reinforce the responsibility and importance of the clearance closure inspections and to remind maintenance staff of the company's 'Safety over Schedule' principles. The operator also proposed to review both the suitability of equipment to gain access to all areas of the APU compartment and relevant licensed aircraft maintenance engineer training.

In addition, as a result of this incident, the ARFF changed its procedures to include that, until an ARFF response was called to a 'STOP', either an aircraft engineer or ARFF member was required to inspect the relevant aircraft compartment or area where a fire had occurred, an aircraft's fire warning system had activated, or an onboard fire extinguisher had been activated. ■