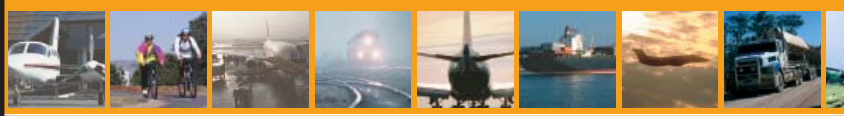
Australian Government
Australian Transport Safety Bureau

# The Australian



## Executive Director's Message

### Reflecting on the ATSB's aviation outputs for 2006–07

*The latest Australian Transport Safety Bureau Annual Review covering 2006–07 was released on 31 October and is available on the ATSB website. The Review reports that in 2006-07 the ATSB instigated 89 aviation investigations and released 80 final aviation occurrence and technical investigation reports. The Bureau received 7,832 notifications of events of which 112 were classified as aviation accidents and 7,720 as incidents and finished the financial year with 87 ongoing aviation investigations. Ten aviation safety research reports were released.*

*During 2006–07, the ATSB finalised its complex investigation into Australian civil aviation's worst accident since 1968, the 15-fatality aircraft accident near Lockhart River, Queensland on 7 May 2005. The 500-page final report released on 4 April 2007 identifies important safety issues to enhance future aviation safety relating to the crew, the operator, regulatory oversight and instrument approach chart design. Three ATSB factual reports, a research report and ten safety recommendations were released during the course of the almost two-year investigation. A further ten safety recommendations were issued with the final report, which also utilised an enhanced ATSB investigation and analysis methodology.*

*Aviation safety messages continued to be well accepted, with operators, manufacturers and regulators undertaking 205 separately identified safety actions based on 41 different ATSB investigations leading to strong gains in safety culture and practice. The ATSB also issued a total of 19 safety recommendations.*

*Amongst other coronial inquests, the ATSB assisted with the coronial inquest into the Lockhart River accident by the Queensland State Coroner which included a month of hearings on Thursday Island and in Brisbane. The Coroner reported on 17 August 2007.*

*The ATSB also cooperated with the Indonesian National Transportation Safety Committee (NTSC) in the investigation of the Garuda Airlines Boeing 737-400 accident at Yogyakarta Airport on 7 March 2007 in which 21 people died, including five Australians, and 12 were seriously injured. ATSB assistance included an onsite team comprising: a Deputy Director and two senior investigators, analysis of flight recorders by several specialists, and the drafting of preliminary and final reports.*

*The ATSB introduced the aviation module of 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. Supplementary modules for rail and marine investigations are in progress.*

*For 2007–08 the ATSB is resourced to undertake around 80 new aviation investigations from the expected 8,000 accidents and incidents to be notified to the Bureau. Tough judgements will again need to be made to maximise safety benefit.*

***Kym Bills, Executive Director***

## Robinson R22 helicopter aerial mustering usage investigation

The number of helicopters registered in Australia has grown steadily over the last decade. By the end of 2006, there were 1,322 helicopters on the Australian civil aircraft register including 818 piston helicopters. The most common make of piston-engine helicopter in Australia is the Robinson R22, manufactured by Robinson Helicopter Company (RHC) in the United States. Around half of all the single-engine piston helicopters operating here are R22 helicopters.

It is not surprising then, that many R22 helicopters feature in the accident statistics. But the R22 has a relatively good safety record compared with other light piston-engine helicopters in Australia, and that record has improved since the early 1990s. It has been a popular choice for private operations, flying training and various types of aerial work activity and is also the favoured type for aerial stock mustering operations – a uniquely Australian application that supports the local beef cattle industry. Despite its popularity in this type of work, little was known about the helicopter's suitability for the task. Like other helicopters on the Australian register, the R22 received its initial airworthiness certification in its country of manufacture (United States). The spectrum of manoeuvres conducted in aerial stock mustering did not form part of the flight profile used when the helicopter type received its certification.

In 2004 the ATSB commissioned AeroStructures, an Australian engineering company, to undertake a study of forces acting on an R22 engaged in aerial mustering operations. Their study provided some useful data on R22 flight profiles in aerial mustering operations, which were compared with the flight profiles used by Robinson Helicopter Company when the helicopter was initially certified. This study also assessed the stresses placed on the helicopter and tail rotor drive shaft during aerial mustering operations.

Overall, the study provided some encouraging data about the R22 in aerial mustering. The report found that the abrupt manoeuvring associated with aerial mustering produced relatively small stresses, whereas the peak stresses found during certification occurred during high speed flight, which is uncommon in mustering operations. The AeroStructures report also highlighted the importance of good handling technique, and especially good engine management. Large and sudden power changes apply very high loads on the aircraft's drive system, and exceed limits set during the certification process.

Light utility helicopters are likely to remain engaged in aerial mustering operations. The R22 has been the most popular model for these types of operations, but owners and operators need to fully appreciate the stresses placed on aircraft during mustering operations, and the characteristics of aerial mustering operations, which may be quite different to the type of flying for which the type originally received certification. ■



# REPCON Status – Australia's aviation voluntary confidential reporting scheme

On 29 January 2007, REPCON (Report Confidentially), a new voluntary confidential reporting scheme for aviation safety, was commenced. The scheme is administered by the Australian Transport Safety Bureau and is consistent with International Civil Aviation Organization (ICAO) Annex 13 recommendations. Information from the reports will be used to identify unsafe procedures, practices or conditions in order to prevent the likelihood or severity of future aviation accidents and incidents.

While Australia has the most comprehensive mandatory safety occurrence reporting legislation in the world, the Australian aviation industry has been keen to see a new confidential reporting scheme introduced with legislative coverage that will protect the identity of the reporter. This will be particularly valuable for reporters who fear reprisal or sanction if they report openly. It will also be valuable for reporters who simply feel more comfortable reporting through a confidential scheme.

## What are the possible outcomes from a REPCON report?

The desired outcomes are any actions taken to improve aviation safety in response to the identified concern. This can include variations to standards, orders, practices, procedures, and increased awareness of safety issues through education campaigns and publication of selected de-identified REPCON reports.

## Progress of the REPCON scheme to date

The REPCON team has received approximately 120 reports since 29 January 2007. This is a great start and we thank reporters for taking the time to submit their safety concerns to REPCON. In accordance with its procedures, the REPCON team has carefully considered each of these reports, made contact with the reporter where considered necessary to clarify aspects of the safety concern and to determine what action is most appropriate in the circumstances, having regard to maintaining the confidentiality of the reporter and any third party referred in the report. Where relevant, the REPCON team has also advised reporters of any action they have initiated in response to the report.

## How can I see the results of the REPCON scheme?

Commencing in the next issue of Flight Safety Australia, selected de-identified REPCON reports will be included in the ATSB supplement - the Australian Aviation Safety Investigator. These reports will be selected on the basis that they represent a safety issue that has resulted in positive safety outcomes or may relate to topical safety issues where general industry awareness of the issue appears beneficial.

## Who can make a REPCON report?

A REPCON report may be made by anyone who was involved in, observes or becomes aware of a reportable safety concern. However, a person who is required to report any matter under the Transport Safety Investigation Regulations 2003, cannot use REPCON as an alternative means of making that report.

REPCON is particularly keen to hear from reporters who may have been involved in a 'close call' and whose story may contain valuable lessons for others. We are all capable of making mistakes which can increase the risk of an accident or incident, for example, making a poor decision or inadequately carrying out a task. After all, we are only human. Sharing these stories can be extremely valuable as a means of improving our knowledge and skills – it may even save someone's life.

## How can I report to REPCON?

Reporters can submit a REPCON report online via the ATSB website. Reporters can also submit via a dedicated REPCON telephone number: 1800 020 505; by email: repcon@atsb.gov.au; by facsimile: 02 6274 6461 or by mail: Freepost 600, PO Box 600, Civic Square ACT 2608.

## How do I get further information on REPCON?

If you wish to obtain advice or further information on REPCON, please visit the ATSB website at www.atsb.gov.au or call REPCON on 1800 020 505. ■

# Safety briefs

## Erratic airspeed indications

Occurrence 200605307

On 7 September 2006, a Boeing 717-200 aircraft, registered VH-NXI, was on a scheduled service from Perth to Port Hedland, WA. About 10 minutes after takeoff, the crew became aware that both the pilot in command's and copilot's computed airspeed displays had become erratic. The pilot in command's computed airspeed rapidly dropped, while the copilot's airspeed gradually increased. During the event, the pilot in command's displayed airspeed dropped as low as 115 kts, while the copilot's computed airspeed reached a maximum of 348 kts. Both the stall warning and overspeed warning sounded. The crew assessed the accuracy of the Integrated Standby Instrument System (ISIS) and used it for air data information.

The crew carried out the non-normal checklist from the Quick Reference Handbook. As part of the checklist, the crew cycled the air data heat switch. Fifteen minutes after the first signs of irregularities, both the pilot in command's and copilot's airspeed displays returned to normal and both airspeeds matched. The aircraft returned to Perth and conducted a normal approach and landing.

Analysis of the recorded data indicated that both the pilot in command's and copilot's pitot probes had iced up, which resulted in erratic airspeed indications and erroneous altitude and Mach numbers. The accuracy of the ISIS could not be determined from the recorded data.

The air data heat switch was removed from the aircraft and examined by the switch manufacturer. The switch manufacturer concluded that the latching mechanism in the switch was damaged, when the lamp capsule was forcibly opened while the switch was in the latched position.

It is possible that a piece of the broken latching mechanism jammed the switch in the OFF position, which resulted in no heat being supplied to the air data sensors, including the pitot probes. ■

## Collision with terrain

Occurrence 200600001

At about 1040 AEST on 2 January 2006, a Cessna Aircraft Company U206 aircraft, registered VH-UYB, took off from the parachuting centre at Willowbank, Qld on a tandem parachuting flight. On board were the pilot and six parachutists.

The surviving Tandem Master parachutist, who was also a private pilot, reported that, at about 100 ft, the aircraft performed as if the power had been 'pulled back'. The aircraft was observed to bank right, before it impacted a tree and became submerged in a dam. The aircraft was destroyed and five persons on board received fatal injuries or were drowned. The two survivors received serious injuries.

Technical examination and test of the aircraft's engine and its associated components did not reveal any anomalies with the potential to have individually contributed to the partial engine power loss. However, the partial engine power loss may have been due to a number of less significant anomalies or an anomaly that was present during the accident flight but not apparent during the subsequent disassembly, examination and testing of the engine and its components.

As a result of this investigation, the Australian Parachute Federation (APF) has addressed a number of safety concerns. The Civil Aviation Safety Authority (CASA) initiated safety action to clarify Airworthiness Directive AD/ENG/4 and the intent of Airworthiness Bulletin AWB 02-003 Issue 2. In addition, CASA is reviewing elements of the various training syllabi and supporting documentation affecting the management of engine and partial engine power loss after takeoff.

As a result of this investigation, the Australian Transport Safety Bureau has issued seven safety recommendations related to airworthiness bulletins, regulations, parachutists' safety and survivability, aircraft maintenance documentation and pilot training in emergency procedures. ■

## Fuel Exhaustion

Occurrence 200504768

At 1910 AEST on 23 September 2005, a Fairchild Industries Inc. Model SA227-AC (Metro III) aircraft, registered VH-SEF, departed Thangool on a scheduled flight to Brisbane, Qld. Two pilots and 16 passengers were on board. Approaching overhead Gayndah, the L XFER PUMP (left fuel transfer pump) amber caution light illuminated, indicating low fuel quantity. The fuel quantity indicator showed substantial fuel in the tanks. The crew completed the checklist actions but the light remained on so they diverted the flight to Bundaberg. About 18 km from Bundaberg, the left engine stopped. The crew then completed a single-engine landing at Bundaberg.

Four pounds (2 L) of fuel was subsequently drained from the left tank, indicating that the left engine stopped because of fuel exhaustion. There was 49 lbs (28 L) fuel in the right tank, sufficient for about 10 minutes flight.

Faults were found in a number of components of the fuel quantity indicating system. The maintenance manual procedures for calibration of the fuel quantity indicating system had not been followed correctly twice in the previous 10 days. The result was that the fuel quantity indicating system was over-reading.

The crew relied on the fuel quantity indicator to determine the quantity of fuel on the aircraft before the flight. That practice was common to most of the operator's crews. The fuel quantity management procedures and practices within the company did not ensure validation of the aircraft's fuel quantity indicator reading. There was also no system in place to track the aircraft's fuel status during and after maintenance.

Following the occurrence, the operator developed new procedures for fuel quantity management and the CASA made rule changes regarding fuel quantity measurement and verification for transport category aircraft. ■

## In-flight breakup

Occurrence 200506266

At 1122 Eastern Daylight-saving Time on 2 December 2005, a Piper Aircraft Corporation PA-31-350 Chieftain aircraft, registered VH-PYN, departed Archerfield, Qld, on a private flight to Griffith, NSW. On board were the pilot, an observer-pilot, and two passengers. The enroute weather was forecast to include occasional thunderstorms. At 1127, a SIGMET was issued advising of frequent observed thunderstorms south of Coonamble, NSW. Air traffic services did not pass the SIGMET information to the pilot of the aircraft, nor did their procedures require the information to be passed. There was no request from the pilot for weather information at any stage during the flight.

After the aircraft passed Coonamble, the pilot reported diverting left of track due to weather. The aircraft then came within air traffic control radar coverage, which showed it flying parallel to track at 10,000 ft, at a groundspeed of 200 to 220 kts. At 1350, the aircraft disappeared from radar and no further radio transmission was received from the pilot. At about 1400, the wreckage of PYN was found approximately 28 km north of Condobolin.

The wreckage trail extended for more than 4 km. The wings, outboard of the engine nacelles, the right engine, and sections of the empennage, had separated from the aircraft in flight. The remaining structure impacted the ground inverted and was destroyed by a post-impact fire. No evidence was found that aerodynamic flutter, in-flight fire or explosion, or lightning strike damage contributed to the circumstances that led to the break-up. However, the extent and nature of the damage precluded a complete examination of the aircraft and its systems.

There was evidence that immediately before the accident, the aircraft was likely to have been surrounded to the east, west, and south by a large complex of storms. The aircraft was not fitted with weather radar. ■

## Engine in-flight shutdown

Occurrence 200605505

On 18 September 2006, at 1417 AEST, a Boeing Co 777-2H6 aircraft, registered 9M-MRM, departed Brisbane Airport, Qld for Kuala Lumpur, Malaysia. The flight crew reported that, at approximately 1422, when the aircraft was 74 kms west-north-west of Brisbane Airport and climbing through 10,300 ft, they felt a 'sudden jerk' followed by an Engine Indication and Crew Alerting System message 'ENG FAIL R'. The crew informed Brisbane Air Traffic Control of the right engine failure and performed the relevant checklist items to successfully restart the right engine.

After dumping fuel to reduce the landing weight, the crew returned the aircraft to Brisbane Airport. The company's ground handling agent's engineering personnel replaced the right engine Fuel Metering Unit (FMU) and the aircraft was returned to service.

The investigation found that there had been a loss of damping fluid in the turbine overspeed servo valve, adversely affecting the operation of the servo valve. As a result, the turbine overspeed servo valve became de-latched, and the engine shut down in flight.

A number of safety actions were carried out as a result of this incident, including by the:

- manufacturer of the turbine overspeed servo valve, who will check the servo valve when the units are returned for overhaul; and
- manufacturer of the FMU, who mandated a check of the torque setting of the turbine overspeed servo valve retaining bolts when the units are returned to their repair bases.

In addition, the engine manufacturer:

- is investigating the feasibility of the development of a test to confirm the serviceability of the turbine overspeed servo valve damping fluid in installed engines; and
- has published non-Mod Service Bulletin NMSB73-F408. That bulletin recommended the on-wing torque inspection of the turbine overspeed servo valve bolts in all installed engines or engines in overhaul shops where the life of the FMU is greater than 5,000 hours.

## Loss of control

Occurrence 200600256

At about 0712 ACST on 19 January 2006, a Beech Aircraft Corp 58 Baron aircraft, registered VH-MNI, departed Darwin Airport, NT, on a charter flight to McArthur River Mine Aerodrome, NT. The flight was conducted under the instrument flight rules. On board were the pilot and one passenger. During the flight, the pilot advised air traffic control that his expected arrival time at McArthur River Mine was 0915. At about 0915, the aircraft was observed to fly overhead the aerodrome at a normal circuit height (1,000 ft above ground level) and it appeared to be tracking to a mid to late downwind position for a landing on runway 24. The aircraft did not land at the aerodrome at the expected arrival time and a search was commenced.

The wreckage was located about 4 km east of the aerodrome. An examination of the wreckage indicated that the aircraft impacted the ground inverted in a steep nose-down attitude. The accident was not survivable. The wreckage was consistent with a loss of control situation, but the likely reason for the loss of control could not be determined.

Safety factors identified included that AusSAR had initially cancelled the uncertainty phase associated with the aircraft without sufficient information being obtained to determine that there no longer existed any doubt in relation to the safety of the aircraft. AusSAR also did not provide clear procedures or guidance to its officers for determining whether there was sufficient information to cancel an uncertainty phase.

The Australian Maritime Safety Authority within which AusSAR is located, has advised that it is planning to review some aspects of its search and rescue procedures. ■