



## Making safe transport even safer



Australia's aviation industry is among the safest in the world. Our strong reporting culture and rigorous investigations mean that when an accident or incident does happen, we're in a good position to prevent it from happening again.

In fact, the information we receive from occurrence reports and our investigation findings allows the ATSB to monitor overall trends in aviation safety. From these trends, we can determine the main risk areas or priorities currently facing Australian aviation.

To better inform the transport community of these priority areas, the ATSB recently released its Safety Watch initiative. Featured on the ATSB website, Safety Watch highlights the main safety concerns across the aviation, maritime and rail industries. It also offers suggestions on how to manage these concerns along with links to safety resources.

Ultimately, Safety Watch aims to make Australia's safe transport systems even safer.

For aviation, we see opportunities for improvement from general aviation through to high capacity airlines. Some of the high risk areas involve wirestrikes, low-level flying, fuel management, handling of approach to land, and data input errors.

We'll be constantly monitoring Safety Watch over the year and will remove or add safety priorities as trends change or improvements are made.

I encourage you to check Safety Watch out and welcome your thoughts and experiences on these safety issues. If you have anything you would like to add, please contribute to the conversation by posting your comment on the Chief Commissioner's blog [www.atsb.gov.au/infocus](http://www.atsb.gov.au/infocus).

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## Safety Watch

The ATSB's website now includes a new resource, Safety Watch, which contains information about safety issues that the commission has identified as 'priority concerns'. The ATSB believes the aviation community needs to pay extra attention to these matters.

The issues currently covered in Safety Watch include:

- **Avoidable aviation accidents**—GA pilots continue to die in accidents that are mostly avoidable.
- **Handling of approach to land**—There is a worrying number of cases where stability is not adequately assessed or uncommon manoeuvres are mishandled.
- **Performance calculations & data input errors**—Human error involving incorrect data entry continues to cause concern. In some cases, aircraft systems and operators' flight management procedures are not catching these errors.
- **Safety in the vicinity of non-towered aerodromes**—Non-towered aerodromes can pose a risk due to poor communication between pilots, ineffective use of 'see-and-avoid' and failure to follow common traffic advisory frequency and other procedures.
- **Robinson R44 fuel tanks**—A significant number of R44 helicopters are not fitted with bladder-type fuel tanks and other modifications detailed in the manufacturer's documentation that provide improved resistance to post-impact fuel leaks and enhanced survivability prospects in the event of an accident.
- **Reporting of accidents, incidents and transport safety concerns**—ATSB research has revealed under-reporting of incidents.

Each page provides links to other resources that provide useful information. These resources include educational booklets, research articles, and accident investigation reports that illustrate the dangers that can arise from these safety issues. You can explore Safety Watch on the ATSB website. ■

# Aviation Safety Bulletin

**The ATSB has released its latest bulletin of short investigation reports. This edition of the Bulletin highlights valuable safety lessons for pilots, operators and safety managers. Several investigations from the Bulletin are featured below.**

## Fuel imbalance

Investigation AO-2012-053

Virgin Australia Airlines is reviewing their program to replace engine fuel feed crossfeed valves after a fuel imbalance on a flight from Gold Coast to Melbourne led to a declaration of a PAN and a diversion to Brisbane.

During climb, the crew observed that both engines were being supplied only from the right fuel tank, resulting in a fuel quantity difference between the left and right fuel tanks. The crew conducted the fuel leak engine checklist. With centre tank fuel available, the crew selected the centre tank pumps on, which resulted in the fuel imbalance stabilising.

Since the crew could not confirm fuel from the left tank could be used once the centre tank pumps were selected off, or that no fuel tank fuel leak existed, they diverted to Brisbane. The aircraft landed safely.

An overhaul organisation inspected the engine fuel feed crossfeed valve and identified wear to the sealing materials and Teflon within the valve body as consistent with the existence of a leak within the valve. However, the overhaul organisation was unable to confirm that the sealing material degradation would explain a high volume internal fuel leakage rate.

Virgin Australia Airlines had previously established an inspection program for

the crossfeed valves in accordance with Boeing recommendations. The operator also has a program in place to replace existing crossfeed valves with a modified version at scheduled maintenance servicing. This program is currently under review for acceleration.

## Are you fit to fly?

Investigation AO-2012-100

The partial incapacitation of a pilot has shown how important it is for pilots to assess their own wellbeing and ability to fly, just as they check their aircraft. In this case, the pilot and a flight nurse were flying from Sydney to Port Macquarie in a Raytheon B200 aircraft to pick up a patient.

After departing Sydney, the pilot began to feel unwell, experiencing abdominal pain and nausea. After donning his crew oxygen mask, the pilot's health improved and he commenced a return to Sydney. During the descent, the pilot removed his oxygen mask and he began to feel unwell again.

The aircraft landed at Sydney and after shutdown the pilot became physically ill. The pilot recovered from the illness about one week later. It was found that he most likely suffered viral gastroenteritis.

## The ongoing danger of carburettor icing

Investigation AO-2012-091

Carburettor icing is a known problem that can have serious safety implications for aircraft. This has been demonstrated most recently in an accident near Miranda Downs in Queensland. On 6 July 2012, a Robinson R22 Beta was conducting mustering operations when

the right skid struck a tree and collided with terrain.

The operator's investigation into the accident—which examined GPS and Bureau of Meteorology data—found that the combination of temperature and dew point indicated a moderate carburettor icing risk at cruise power and a serious icing risk at descent power.

Pilots are reminded to maintain awareness of the weather conditions that are conducive to carburettor ice formation and closely monitor their aircraft performance during times when the risk exists.

## The dangers of using a phone while driving airside

Investigation AO-2012-090

An incident at Mackay Airport has highlighted the potential distraction presented by portable communication devices, especially in the dynamic airside environment.

On 29 June 2012, a Piper PA-31 Navajo aircraft, took off from runway 05 at Mackay Airport. At that time, an Airport Safety Officer (ASO) was conducting an airfield runway and lighting inspection in an airfield safety vehicle and moving in a north-westerly direction along runway 32. Despite an earlier air traffic control instruction to hold short of runway 05, the ASO was distracted by a telephone call and continued along runway 32, crossing runway 05. The Piper PA-31 passed over the airfield safety vehicle by an estimated vertical distance of 30 feet. ■

These reports along with other investigations are available on the ATSB website.

# Deadline for R44 helicopter fuel tanks

**The deadline is fast approaching for R44 helicopter operators to replace their all-aluminium fuel tanks with the bladder-type tank.**

In response to a number of R44 helicopter post accident fires, the Robinson Helicopter Company has produced a retrofit that replaces the R44 all-aluminium fuel tanks with bladder-type tanks. The bladder tanks provide improved resistance to post-accident fuel leaks due to their increased cut and tear resistance and the ability to sustain large deformation without rupture.

**Two fatal R44 helicopter accidents in Australia have demonstrated the potential danger of the all-aluminium fuel tank.**

The manufacturer has issued two important Service Bulletins aimed at reducing the risk of a potentially fatal post-impact fire.

The first, SB-78B, requires that R44 helicopters with all-aluminium fuel tanks be retrofitted with bladder-type tanks as soon as practical, but not later than 30 April 2013.

The second, SB-82, aims to reduce the chance of the rotor brake switch as a possible ignition source in the event of a fuel leak.

***The ATSB strongly encourages all operators and owners of R44 helicopters fitted with all-aluminium fuel tanks to consider replacing these tanks with bladder-type fuel tanks as detailed in the manufacturer's Service Bulletin 78B as soon as possible.***

More information on the R44 fuel tank safety concern, along with details of the two investigations, is available on the ATSB web page [www.atsb.gov.au/safetywatch](http://www.atsb.gov.au/safetywatch).



 Wreckage of the R44 helicopter after crashing at Cessnock Aerodrome

## Safety Management Systems

A new ATSB research report examines the effectiveness of safety management systems (SMS) and provides important insights for operators and organisations. SMS refer to organisations having a systematic approach to managing safety, including organisational structures, accountabilities, policies and procedures. They generally include common elements such as explicit management commitment to safety, appointment of key safety personnel, hazard identification and risk mitigation, safety investigations and audit, and safety performance monitoring.

This research is especially timely because aviation, marine and rail industries have all recently incorporated safety management systems into regulations and operations as a required way of managing safety. Although Australia's transport industries' SMS approach is following world's-best practice, there has been little empirical evidence presented as

support for how the SMS approach actually influences safety.

Dr Matthew Thomas undertook a comprehensive search of the literature that exists around SMS, examining existing studies and comparing their findings. The review found that safety management systems do appear to reduce accidents and improve safety in high-risk industries. At present, however, there have only been a small number of quality evaluations and it is unclear as to whether any individual elements of a SMS have a stronger influence on safety than other elements. At the same time, it is clear that management commitment and appropriate safety communications do affect attitudes to safety. Transport organisations that provide an appropriate investment and commitment to a safety management system should receive a positive return on safety.

The research report XR-2011-002 is available on the ATSB website. ■

## Single-pilot flight operations must manage pilot fatigue

Investigation AO-2011-033

**The investigation into the collision with water off Horn Island, Queensland highlights the importance of pilots having enough sleep before a flight and for operators to manage potential fatigue risks.**

On 24 February 2011, the pilot of an Aero Commander 500S commenced a freight charter flight from Cairns to Horn Island at 0445 under the instrument flight rules. The aircraft arrived at Horn Island at about 0720 and the pilot advised air traffic control that he intended holding east of the island due to low cloud and rain. At 0750 he advised that he was north of Horn Island and intending to commence a visual approach. When the aircraft did not arrive, a search was commenced but the aircraft was not found. It was eventually located on 10 October 2011 on the seabed about 26 km north west of the island.

The ATSB investigation found that the aircraft had not broken up in flight and that it had impacted the water at relatively low speed and a near wings-level attitude, consistent with it being under control at impact. There is insufficient evidence to determine why the aircraft impacted the water, however,



Underwater wreckage of the Aero Commander 500S off Horn Island, Qld

several aspects of the flight increased risk. The pilot had only four hours sleep the night before the flight and the operator did not have any procedures or guidance in place to minimise the fatigue risks of early starts. In addition, the pilot, who was also the operator's chief pilot, had either not met the recency requirements or did not have an endorsement to conduct the types of instrument approaches available at Horn Island and other locations.

The operator ceased operations following the accident and therefore did not have the opportunity to improve its processes. CASA has issued a notice of proposed rule-making relating to flight crew fatigue management. In the case of single pilot public transport operations, this included a proposal to limit the duration of a flight duty period and the number of late night flight duty periods in certain circumstances. ■

*Keeping an eye on safety*

# SafetyWatch

AVIATION | MARINE | RAIL

[www.atsb.gov.au/safetywatch](http://www.atsb.gov.au/safetywatch)

# Learning from others

## Strap up, helmet on: two ways to make helicopter flying safer

Investigation AO-2011-108

A recent fatal helicopter accident serves as a reminder of the importance of wearing a helmet and shoulder harness restraints while flying in a helicopter.

The accident occurred on 26 August 2011, when the helicopter was conducting sling load operations near a small village, 183 km from Port Vila in Vanuatu. The Civil Aviation Authority of Vanuatu requested that the ATSB conduct an investigation.

Sling loading involves the carrying of a cargo at the end of a long cable or rope. ATSB investigators found that as the helicopter approached to land, the wire rope attached to the helicopter's cargo hook contacted a tree. That contact resulted in the rope fouling on the main rotor blades, becoming entangled and leading to the detachment of segments of the rotor blades and the tail boom. This rendered the helicopter uncontrollable. The pilot died in the accident and two passengers were injured (one of them seriously).

The ATSB investigation also found that none of the helicopter's passengers were wearing the installed shoulder harness restraints or using flight helmets, leaving them much more vulnerable to injury.

The severity of contact injuries in helicopter accidents can be significantly reduced by the use of shoulder harnesses and protective flight helmets. A study of survivable helicopter accident involving US army aircraft concluded that by wearing a good protective helmet, 'helicopter crewmembers can reduce their chances of sustaining severe head injuries in a serious but potentially survivable crash by a factor of five.' The ATSB encourages pilots and operators to use this equipment to make their flying safer.

## Managing partial power loss after takeoff

Investigation AO-2012-017

A fatal accident involving a De Havilland Tiger Moth at Maryborough Airport on 27 January 2012 illustrates several of the points made in the ATSB's research report *Managing partial power loss after takeoff in single engine aircraft*.

In this instance, immediately after lift-off, the aircraft was observed to have a partial, intermittent power loss. The pilot continued the flight with the aircraft maintaining altitude or climbing slightly. At the upwind end of the runway, the aircraft made a climbing left turn before stalling and descending. The aircraft impacted the ground and was seriously damaged by the accident forces and post-impact fire. Both occupants died.

The ATSB investigation found that the power loss was probably caused by a partial blockage of the aircraft's fuel cock. Although sufficient runway remained ahead to allow a safe landing, the flight was continued under limited power without gaining sufficient height to clear trees beyond the runway. Approaching the trees, the aircraft climbed, lost airspeed, stalled and collided with terrain. There would have been a safer outcome had the pilot immediately landed the aircraft straight ahead.

Pilots are reminded that continued power in such circumstances is unpredictable and the risk can be reduced by conducting a controlled landing at the earliest opportunity.

*Managing partial power loss after takeoff in single engine aircraft* is available for free from the ATSB.

## Watch out for wires

Investigation AO-2012-079

The ATSB's investigation into a wirestrike accident highlights the importance of a proper reconnaissance when flying in a wire environment and remaining focused only on operational tasks.

On 12 June 2012, a Robinson R44 Raven 1 helicopter departed Moorabbin Airport with one person on board to conduct a private flight to a property at Moolort, Victoria. During the flight, the pilot decided to check on the progress of a bore under construction. He landed at the bore site and, after a short time on the ground, decided to depart in the same direction as his approach – parallel to a main powerline.

As the helicopter transitioned from the hover to forward flight, the pilot saw a single strand powerline directly ahead. There was no time to avoid the wire and the helicopter struck the wire on the middle of the main rotor mast. The helicopter swung upwards on the wire and the pilot remembered seeing the sky before the wire broke, releasing the helicopter.

The pilot had limited control and was able to change the attitude to remain relatively straight and level until the helicopter landed heavily. The pilot was not injured but the helicopter was seriously damaged.

The pilot reported that he had been focused on avoiding the main powerline and had not seen the second powerline during his scans of the area on arrival or before departure.

The accident highlights the importance of a proper reconnaissance when flying in a wire environment and remaining focused only on operational tasks. The pilot's reaction to the wirestrike, which was to continue to fly the aircraft to the ground, assisted him to land without injury.

Wirestrikes are the third most prevalent cause of fatal accidents in private flying operations. The ATSB's Avoidable Accident booklet *Wirestrikes involving known wires: A manageable aerial agriculture hazard* provides a number of strategies to help pilots manage the on-going risk of wirestrikes.

These reports are available on the ATSB website. ■



### Australia's voluntary confidential aviation reporting scheme

REPCON allows any person who has an aviation safety concern to report it to the ATSB confidentially. All personal information regarding any individual (either the reporter or any person referred to in the report) remains strictly confidential, unless permission is given by the subject of the information.

The goals of the scheme are to increase awareness of safety issues and to encourage safety action by those best placed to respond to safety concerns.

### Reported problems with PT-6A engines

The reporter expressed a safety concern regarding the chip detector circuit in the Pratt & Whitney PT6A-42 engine which is used in the Hawker Beechcraft B200. The reporter stated that if, following the illumination of the chip detector warning light, metal continues to build up on the chip detector, the magnetic poles may be earthed to the engine casing, tripping the chip detector circuit breaker, resulting in the chip detector warning light extinguishing.

The reporter is concerned that the non-normal procedure for a chip detector warning light is to monitor engine indications and if further abnormal engine indications are received to shut down the engine. If the chip detector light then extinguishes, there is no guidance in the Pilot Operating Handbook (POH) regarding what action is required.

The reporter suggests that the non-normal checklist should be amended to include a procedure to follow when the chip detector warning illuminates and subsequently extinguishes. He suggests the procedure should include checking the circuit breaker, and if the circuit breaker has popped, the pilot should be made aware that an engine failure may still be imminent.

The reporter is further concerned with a scenario where the chip detector warning light illuminates and then extinguishes prior to a normal landing. If the next pilot to fly the aircraft does not notice the circuit breaker position, they may depart without warning of a potential engine failure, possibly on takeoff.

### P&W response:

PWC has reviewed the subject REPCON and wishes to offer the following comments.

While P&WC provides the chip detector and the maintenance criteria to be followed in the event of chip detector indication, the airframe provides the circuitry and the operational instructions in the event of indication, or loss of indication. PWC would like to suggest that this issue could be directed to Hawker Beechcraft for comments and resolution, as appropriate.

### CASA response:

CASA has undertaken a review of its Service Difficulty Reports database to identify events of this nature over the last five years. The collated data identified 10 reports associated with metal contamination and magnetic plug service difficulties, with only two events identifying the scenario where the chip detector warning light illuminated, and then extinguished.

CASA has contacted the operator and maintenance organisation involved and suggested that they should engage the expertise of the Hawker Beechcraft Company to achieve an appropriate outcome for this issue. CASA has requested a compilation of the communication that has taken place between all organisations involved and will then analyse the information to establish if the parties are taking appropriate action to address the safety concern. If not satisfied with the response, CASA will initiate further action with the operator, manufacturer and governing authorities (FAA), as deemed necessary.

### Concern regarding the use of crew rest facilities

The reporter expressed a safety concern regarding the use of the crew rest area by international flight crews from a different airline.

The reporter stated that during an international flight, two off-duty pilots from a different airline were given the Flight Deck Emergency Code and unsupervised access to the flight crew rest compartment for the duration of the flight. These pilots were travelling as passengers on non-revenue tickets.

### Airline response

Our procedures require the Flight Crew Rest Area to be treated with the same level of security as the Flight Deck. This occurrence was also reported via the internal safety reporting system and the following immediate actions were initiated:

- all Crew have been reminded of their obligations in regards to access to Flight Crew/Cabin Crew rest areas and the Flight Deck
- change of access code to the respective doors communicated
- initiation of a review of procedures for change of access code at regular intervals. ■



### What may be reported with REPCON?

Any matter may be reported if it endangers, or could endanger the safety of an aircraft.

Submission of a report known by the reporter to be false or misleading is an offence under section 137.1 of the Criminal Code.

### How can I report to REPCON?

**Telephone:** 1800 020 505

**Email:** [repcon@atsb.gov.au](mailto:repcon@atsb.gov.au)

**Mail:** Freepost 600  
PO Box 600, Civic Square ACT 2608

**Online:**

[www.atsb.gov.au/voluntary.aspx](http://www.atsb.gov.au/voluntary.aspx)