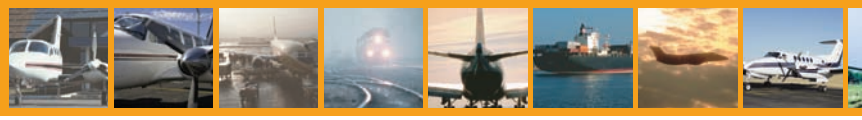
Australian Government
Australian Transport Safety Bureau

The Australian



Talking with industry to improve safety

As the national transport safety investigator, the ATSB is committed to sharing important safety messages with industry.

Recently, we presented at a newly created industry working group comprising human factors and non-technical safety specialists from Alliance Airlines, Virgin Group, Tiger Airways, Qantas Group, Strategic Airlines, Air North, Aero-care and Regional Express.

The meeting gave us a great opportunity to share and discuss emerging safety issues, particularly in the human factors area, with key people in the aviation industry.

Our contribution to this group demonstrates our commitment to talk more openly with industry.

Promoting safety messages is a big part of the ATSB's business. The lessons we uncover from individual investigations often has wider, systemic safety benefits for transport safety as a whole.

By talking directly and openly with industry we better target our safety advice. Importantly, these discussions allow us to share and discuss ideas to improve transport safety.

You will see more of us over the coming months.

We will focus our efforts on directly reaching a wide range of people and organisations, including representative bodies, industry forums, flying schools and flying clubs. This will involve the full spectrum of operators from private pilots to high capacity airlines.

I very much look forward to continuing the conversation to improve transport safety.

Martin Dolan
Chief Commissioner

Check Robinson R44 helicopter hydraulic-boost systems: ATSB urges operators

ATSB investigation report AO-2011-016

Left and right hydraulic boost servos

A fatal accident involving a Robinson R44 helicopter has prompted the ATSB to issue a Safety Advisory Notice advising operators to inspect the security of the hydraulic-boost servos in their R44 helicopters.

On 4 February 2011, a Robinson R44 Astro helicopter crashed at Cessnock Aerodrome after part of the aircraft's flight controls separated from the hydraulic-boost system.

The pilot was conducting circuit operations as part of a biennial helicopter flight review with a flight instructor and passenger on board.

Following the completion of a landing as part of a simulated failure of the helicopter's flight control hydraulic-boost system, the instructor assessed that the hydraulic system had actually failed. He elected to reposition the helicopter on the aerodrome and, on becoming airborne, the aircraft became increasingly difficult to control. Subsequently, the helicopter collided with the runway in a steep left bank and caught fire.

The pilot survived but the instructor and passenger died in the accident.

The ATSB's investigation found that a bolt securing part of the flight control system had detached, causing loss of control of the helicopter. The helicopter manufacturer has advised the ATSB that a break in the connection of any of the push-pull tubes, whether above or below the hydraulic-boost servos, will lead to immediate loss of control of the helicopter.

A hydraulic-boost servo makes it easier for the pilot to handle the flight controls—similar to power steering in a car.

The preliminary results of the investigation have prompted the ATSB to urge operators of R44 hydraulic system-equipped helicopters to inspect and test the security of the flight control attachments on their R44 helicopters, paying particular attention to the connections at the top and bottom of the servos.

Operators who find anything unusual on inspection of R44 flight controls are asked to contact the ATSB on 1800 020 616.

The ATSB's preliminary factual report is available at www.atsb.gov.au

The investigation is continuing and the ATSB will release a final investigation report within 12 months. ■

Aviation Safety Investigator

Poor procedures top aviation safety issues

Poor or insufficient procedures are the most common type of safety risk identified by the ATSB's aviation safety investigations.

In a newly released ATSB research report, 46 safety issues are identified from ATSB investigations during 2009–10 financial year. (A safety issue is something found during an investigation that has the potential to adversely affect the safety of future operations.)

Most of these issues were associated with flight operations.

Overwhelmingly, the majority of safety issues related to poor or inadequate risk control procedures. This primarily relates to insufficient guidance provided by operators of high capacity and other passenger operations, covering a wide range and variation of procedures.

> "While poor or inadequate procedures rated as the most common type of aviation safety issue, they also accounted for the highest number of safety actions undertaken by operators, manufactures and CASA"

ATSB Chief Commissioner, Mr Martin Dolan, said the results reinforce the vital role procedures play in safe flying.

'The report tells us that poor or inadequate aviation procedures accounted for 44 per cent of all our identified safety issues and pose the most significant risk to flight safety,' Mr Dolan says.

'This is a timely reminder for all operators that appropriate and sufficient standard operating procedures remain one of the most important defences against accidents in aviation. With the complexity of modern aircraft, pilots are very reliant on adequate and accessible procedures to ensure they can adequately deal with the broad range of issues that may arise during operation.'

While poor or inadequate procedures rated as the most common type of aviation safety issue, they also accounted for the highest number of safety actions undertaken by operators, manufacturers and the Civil Aviation Safety Authority (CASA).

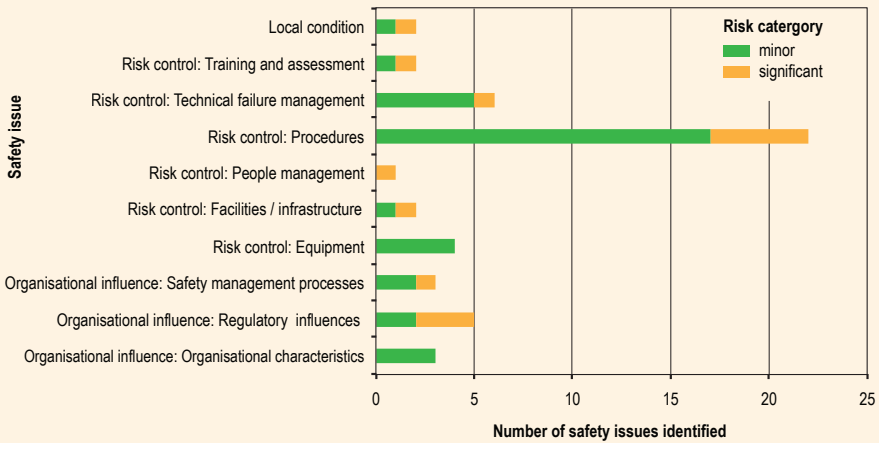
'I'm pleased to see that industry is proactively responding to these safety issues by improving procedures, documentation and education,' Mr Dolan said.

Overall, operators, manufacturers and the regulator undertook 60 safety actions to deal with the safety issues identified through ATSB investigations. The ATSB was generally satisfied with these actions, only making one recommendation for further safety action to address unacceptable risk.

CASA has also responded to identified safety issues by conducting greater safety surveillance and follow-up activity. This has included following up on an operator's checklist procedures and issuing a series of directions to an operator to address fuel quantity measurement procedures and flight crew training.

A full copy of *Safety issues and safety actions identified through ATSB transport safety investigations: 2009–2010 financial year* is available on the ATSB website at www.atsb.gov.au ■

Safety issues identified in aviation investigations

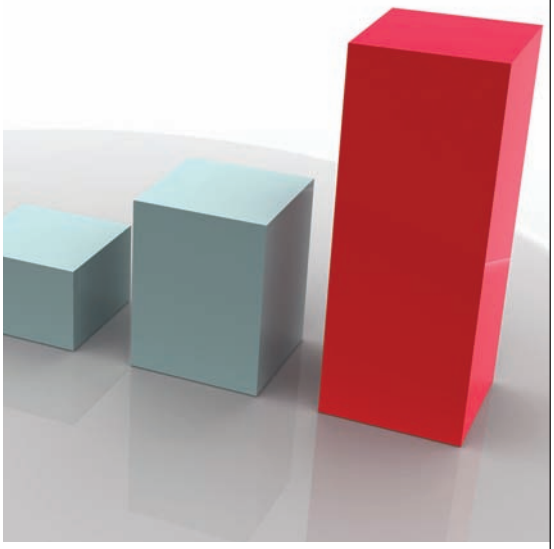


General aviation has most fatalities

The rate of fatal accidents in general aviation is 3½ times higher than for air transport activity, according to a newly released ATSB report.

The statistical report examines aviation accidents and incidents between 2001 and 2010 across all aviation types in Australia.

During the past ten years, there were 236 people killed in 147 fatal accidents in general aviation. General aviation includes all VH-registered flying activities except scheduled and charter passenger and freight operations.



Within general aviation, private flying accounted for the highest number of fatalities at 135 people between 2001 and 2010.

ATSB Chief Commissioner, Mr Martin Dolan, said anyone involved in general aviation, and private pilots in particular, should take heed of these findings.

'This report is a startling reminder of the dangers facing private pilots and general aviation as a whole,' Mr Dolan said. 'What's more, many of these tragedies could have been avoided with simple risk management procedures.'

Mr Dolan says the ATSB is focussing more effort on targeting general aviation with safety messages due to the high number of accidents in this area.

'We've been preparing a series of publications for general aviation and private pilots,' said Mr Dolan. 'We have drawn graphic attention to the consequences of doing risky things such as low flying, which has led to a series of fatalities over time.

'We are also assisting private pilots to better assess the set of risks they are facing and how to deal with this risks.'

A copy of the statistical report, *Aviation Occurrence Statistics, 2001 to 2010* is available on the ATSB website.

You can also find a range of safety education material under the Publications tab on the ATSB's website. ■

Top five accidents and serious incidents (General Aviation)

1. Terrain collisions (e.g. ground strikes; wirestrikes)
2. Aircraft control (e.g. hard landing; loss of control; unstable approach; wheels-up landing)
3. Powerplant and propulsion (e.g. partial and total power loss; engine failure; propeller failure; transmission and gearbox issues)
4. Aircraft separation (e.g. breakdown of separation; mid-air collision)
5. Runway events (e.g. depart, approach, land wrong runway; runway excursion and incursion; runway undershoot).

Top five accidents and serious incidents (Air transport—fare-paying passenger aircraft)

1. Aircraft separation (e.g. breakdown of separation; mid-air collision)
2. Aircraft control (e.g. hard landing; loss of control; unstable approach; wheels-up landing)
3. Powerplant and propulsion systems (e.g. partial and total power loss; engine failure; propeller issues; transmission and gearbox issues)
4. Miscellaneous events (e.g. crew incapacitation; depressurisation; missing aircraft; security issues; stall warnings; laser-related issues; unauthorised low flying; warning device issues)
5. Terrain collisions (e.g. ground strikes; wirestrikes)

Reducing the incidence of stickshaker activations

ATSB investigation AO-2008-064

In response to a flight that experienced two stickshaker activations in rapid succession, the aircraft's operator has taken several proactive steps to reduce the incidence of stickshaker events across their Boeing 717 (717) fleet.

On 18 September 2008, a 717 passenger flight departed Cairns with 70 passengers, four cabin crew and two flight crew on board. During the manually-flown visual approach to Alice Springs Aerodrome, the stickshaker activated. While continuing the turn onto the final approach, the pilot lowered the nose and the stickshaker activated again. The flight crew stabilised the approach to within the operating criteria and landed the aircraft without further incident.

The ATSB's investigation revealed that a combination of bank angle, high nose-up pitch change rate and airspeed slightly below the approach speed activated the stickshaker. The aircraft was higher, faster and closer than it should have been for the direct-to-final approach.

The investigation found that the flight crew did not engage the aircraft's autothrottle after the automatic flight system was disconnected earlier in the approach, which contributed to the airspeed reduction. It also found that the pilot's response to the stickshaker activation did not conform to the aircraft manufacturer's procedures.

While the investigation did not identify any organisational or systemic issues that might adversely affect aviation safety, the aircraft's operator proactively issued pilot notices covering flight mode annunciator and automation mode, buffet protection and the stall recovery procedure in the 717.

In addition, the operator amended a number of its simulator training requirements and worked with the aircraft manufacturer to better understand the 717's stall protection system to avoid future stickshaker events.

A copy of the investigation report is available on the ATSB website at www.atsb.gov.au ■

Going on site: the Bathurst Island investigation

The ATSB investigates around 100 accidents and incidents a year. The circumstances surrounding these accidents vary tremendously, with investigators working in every environment, from city streets to the remote reaches of the outback. Regardless, investigators are prepared to depart any time of the day or night. Every investigation brings its own unique challenges.

On 5 February, a Cessna 310 collided with terrain near Bathurst Island Aerodrome. The pilot suffered fatal injuries. The ATSB officer who would take the role of Investigator in Charge (IIC) first heard about the accident after midnight. She was at home, and was woken by the phone. 'I keep the phone ringer turned up all the way, and a pad and pen right by the bed, so that I can get the information down,' notes the IIC. 'They were looking for the missing aircraft, but nothing had been confirmed.' Then, at about 4:30 AM, a second call, advising that the wreckage had been found.

'It's pretty likely we'll investigate,' the manager said, 'so get your stuff together.'

An investigator's stuff is their kit. There are items common to every kit. Clothes for several days (selected according to the destination.) Sunscreen. Protective equipment for the site: gloves, masks, biohazard bags. But there is also variation. Some people bring a multi-tool. Licensed Aircraft Maintenance Engineers (LAMEs) take a tool kit. One investigator, upon hearing where they would be working, brought a machete.

An hour later, confirmation came. The team had to be at the airport in two and a half hours for a flight to Northern Territory. The team would consist of the IIC, a LAME, an operations specialist, and an IIC Mentor.

'They advised us that the accident site was in pretty dense scrub, and a bit of a walkout from the runway.' Given the lateness of the day, the team chartered a plane to Bathurst Island the next day.

'We got the charter to fly over the accident site,' remembers the IIC. 'You could see there had been a fire, a little area of brown amidst the green.' The site

was about a kilometre from the runway, beyond a mangrove swamp and a small river. They took a circuitous route to avoid the swamp, and to reach a place where a fallen log allowed them to cross. Accompanying them were two police officers with a shotgun, in case they met pigs or crocodiles. The machete made an appearance, blazing a trail.

'It was very hot and humid, and we had a lot of equipment, including a toolkit which weighed about 20 kilos' At the site, the team conducted a first walkthrough, checking for hazards as well as to get an overview of the wreckage. They also experienced a fair amount of rain. 'I've never been in rain that heavy,' remembers the IIC. 'The GPS was damaged, and there were camera difficulties from the rain and the humidity. Normally, investigators would look for groundscars from the wreckage, but the ground was so wet and boggy that there wasn't much to see.'

The team spent two days at the site. When they left, they took with them notes and pictures, some paperwork they'd retrieved, and some instruments and gauges. The preliminary report on the accident has been completed, but it will be many months before the final report is completed. ■

Bathurst Island accident

ATSB investigation AO-2011-017

The ATSB has released its preliminary investigation report into a 5 February 2011 fatal aircraft accident on Bathurst Island.

The accident occurred shortly after the pilot of a Cessna 310R aircraft, , registered VH-XGX, took off from Bathurst Island aerodrome.

Witnesses reported hearing a loud noise and seeing a light from the direction of departure. The aircraft wreckage was later found about 1 km from the end of the runway.

The pilot, the sole occupant of the aircraft, died in the accident and the aircraft was destroyed on impact and by post-impact fire.

The aircraft crashed into a heavily wooded area. Contact marks on a number of trees suggested that the aircraft probably had a shallow angle of descent into the ground, and that the wings were level.

The wreckage trail,approximately 120 m in length, was in line with, and on the same heading as the runway. All major aircraft components were accounted for at the accident site.

Both engines had detached from the aircraft during the accident. The extent of the rotational damage observed on both propellers suggested that both engines were producing significant power at the time of impact.

Heat-damaged wreckage and foliage in the local area indicated that a significant fire had engulfed the area during impact.

The investigation is continuing.

The ATSB anticipates releasing a final report into the accident within a year of the occurrence. ■

What is REPCON about?

REPCON is a voluntary confidential reporting scheme that complements the ATSB's mandatory reporting system. REPCON aims to capture safety issues that would not be captured by other systems. It is not an alternative to reporting the types of occurrences that must legally be reported to the ATSB. Instead, REPCON allows you to report safety concerns if other means are unsuccessful or you need to maintain confidentiality for fear of repercussions.

REPCON issues briefs that contain only a de-identified text—text that has been agreed upon by the reporter, and that protects the privacy of the reporter and anyone referred to in the report. Information from the brief can be used by industry or by CASA to address the problem.

The REPCON system is designed so that if your report is accepted under the scheme, the only way that anyone will ever know your name is if you tell them or you consent to it being disclosed.

What can be reported through REPCON?

If you are concerned about a matter that 'endangers, or could endanger, the safety of air navigation', you can report it to REPCON. Importantly, rather than reports of specific 'occurrences' (which are required to be reported under the mandatory scheme) REPCON should be used to address broad safety issues, systemic problems, or situations where the culture or the organisation has the potential to affect safety.

> "The more details you provide, the more credibility your report will have"

REPCON should be used to raise safety concerns that relate to broad safety issues such as:

- fatigue experienced by the crew due to duty rosters developed by the operator or those that are allowed by legislation
- systemic issues within an organisation such as a maintenance organisation where equipment or tooling or parts needed to perform a maintenance task are not available, resulting in individuals being placed in a difficult position
- organisational culture where published material has a safety message to do things one way, but management do not give the opportunity for this to occur or encourage/condone other actions that negate the safety message
- situations where an organisation suppresses reports by not reporting to the ATSB or CASA, or employees are told that they will incur disciplinary actions if they report to the ATSB or CASA
- situations where the culture within an organisation is to cut corners to achieve an outcome within a certain time frame, such as signing that maintenance was carried out when it wasn't, or resetting the defective equipment and signing the aircraft as serviceable to get it home to main base
- insufficient staff with qualifications or experience.

When submitting a REPCON report, you should provide examples to support your concerns. The more details you provide, the more credibility your report will have. Also, providing as much information as possible to support your concern will help ensure a more thorough investigation is carried out by the operator and CASA.

When should you report through REPCON?

REPCON should only be used if you are concerned about your confidentiality and there is no other reporting scheme offered by the operator, Airservices Australia or CASA that you feel confident in reporting to.

> "...the only information REPCON releases to the operator or regulator is the de-identified text"

If you wish direct action to be taken about a specific incident or individual, then you should report through avenues other than RECPON— the only information REPCON releases to the operator or regulator is the de-identified text.

What things are not accepted by REPCON?

Reporting through REPCON does not constitute a report under the ATSB mandatory reporting scheme required by the TSI Act. Reporting under the TSI Act is mandatory for people who are obliged to report. Non-reporting is a criminal offence, although concerns about the repercussions of use of the mandatory scheme to report an occurrence would be accepted by REPCON.

> "Industrial relations issues are also not within the scope of the REPCON scheme"

REPCON does not accept concerns involving a serious and imminent threat to a person's health or life, or about a serious crime. These should be reported directly to the responsible body, such as CASA or the police, or another organisation that can take immediate action.

Acts of unlawful interference including terrorist activities are also not within the scope of the REPCON scheme. These reports should be directed to the Office of Transport Security or the police.

Industrial relations issues are also not within the scope of the REPCON scheme. These reports should be directed to the relevant union body.

Note: It is a criminal offence to make REPCON reports that are known by the reporter to be false or misleading. ■

REPCON briefs

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.

REPCON would like to hear from you if you have experienced a 'close call' and think others may benefit from the lessons you have learnt. These reports can serve as a powerful reminder that, despite the best of intentions, well-trained people are still capable of making mistakes. The stories arising from these reports may serve to reinforce the message that we must remain vigilant to ensure the ongoing safety of ourselves and others.

Aircraft modifications

Report narrative:

The reporter expressed safety concerns about alleged unauthorised aircraft modifications and flight tests of a company Cessna 172 aircraft without the appropriate CASA airworthiness approvals. An example given was the removal of the rear seats to accommodate test equipment.

Action taken by REPCON:

REPCON supplied CASA with the de-identified report. CASA advised that the operator's aircraft was modified using approved data (CAR 35 Engineering Orders). The work was carried out by an approved Certificate of Approval holder and the modifications did not require flight testing. In these circumstances no further action will be taken by CASA.

Non-Maintenance ports

Report narrative:

The reporter expressed safety concerns that there are many occasions where company aircraft continue flying at non-maintenance ports with defects that warrant maintenance action to be taken before further flight.

An example (given only to show that a systemic issue may exist) was the illumination of the overhead reverser light and master caution on landing at a designated non-maintenance port. The crew were instructed by the operator to cycle the reverser and proceed if the light extinguished. On landing at the next destination, a maintenance port, the lights illuminated again. Troubleshooting the defect was not able to isolate the fault and the Minimum Equipment List was applied to deactivate the faulty thrust reverser system. In accordance with the approved maintenance data, the aircraft was not able to continue flying with that defect on an active thrust reverser. The maintenance manual is reported to make no reference to cycling the reverser to rectify a problem. In this particular aircraft cycling the reverser actually inhibits the overhead reverser light until the next landing, but the fault that prompted the light may still remain in the reverser system. It is reported that the aircraft had a history of this defect.

Action taken by REPCON:

REPCON supplied CASA with the de-identified report. CASA provided the following response:

> CASA has reviewed the matters raised in this Report with the operator. As indicated in [the manufacturers'] Service Letter and [the manufacturers'] Digest, many of the 'reverser' light events are caused by flight crew operation and do not recur after reset. The digest says, in part: "Also, cycling the thrust reversers through five complete cycles will reset the Engine Accessory Unit (EAU) if no additional faults are recorded". If there is a hard fault, the 'reverser' light will remain illuminated and the Engine Accessory Unit (EAU) will not reset. If there is an intermittent fault, the light will be extinguished but will illuminate again when the fault recurs, but dispatch is permitted if the EAU is successfully reset.
>
> The operator has advised that the above technique is used to recover an aircraft from non-maintenance ports from time to time, but if the EAU does not reset, then a LAME is sent to investigate and rectify the hard defect. Flight crew do not carry out procedures with reference to the AMM [aircraft maintenance manual] and it is intended that if engineering staff are available, then the reset should be carried out on the EAU with reference to the AMM in order to preserve defect history. CASA is satisfied that there are no systemic issues in relation to this matter.

What is not a reportable safety concern?

To avoid doubt, the following matters are not reportable safety concerns and are not guaranteed confidentiality:

a) matters showing a serious and imminent threat to a person's health or life;

b) aircraft;

c) industrial relations matters;

d) conduct that may constitute a serious crime.

Note: REPCON is not an alternative to complying with reporting obligations under the Transport Safety Investigation Regulations 2003 (see www.atsb.gov.au).

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?

Online: www.atsb.gov.au/voluntary.aspx
Telephone: 1800 020 505
Email: repcon@atsb.gov.au
Facsimile: 02 6274 6461
Mail: Freepost 600
PO Box 600, Civic Square ACT 2608