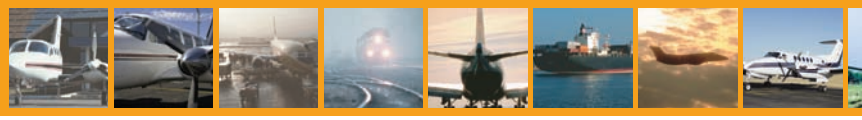
Australian Government
Australian Transport Safety Bureau

The Australian



Turning safety issues into action

The ATSB recently released a research report that examines the safety issues—and the resulting actions—we identified across the aviation sector during 2009–10.

From our investigations, we uncovered 46 safety issues in the aviation industry (a safety issue is a factor that could adversely affect the safety of future operations).

The report also shows that operators, manufacturers and the regulator undertook 60 safety actions to deal with these issues. The ATSB was satisfied with these actions, only making one recommendation for further safety action.

This is a positive sign. It shows that industry is taking safety seriously and is committed to improving safety when becoming aware of unacceptable risks.

It also means that by working together, the ATSB along with other transport safety bodies and industry are making a real difference to transport safety.

While these actions represent a positive safety outcome, we continue to see pilots—particularly general aviation pilots—dying in recurring types of aviation accidents. Tragically, many of these accidents could have been avoided through basic risk management strategies.

In this edition of Flight Safety Australia, we feature two articles that offer techniques on avoiding accidents involving wirestrikes and partial power loss.

I encourage all general aviation pilots to read these articles and seriously review the strategies that can help make flying safer.

Martin Dolan
Chief Commissioner

Kokoda crash prompts major safety improvements

ATSB investigation report AO-2011-016

Extensive safety improvements have taken place in PNG aviation as a result of the PNG Accident Investigation Commission's (AIC) investigation into the fatal aircraft accident near Kokoda.

The ATSB provided investigator support, information and technical advice and facilities support to the investigation, following a request for assistance from the AIC.

On 11 August 2009, a de Havilland Canada DHC-6 Twin Otter aircraft, registered P2 MCB, with two pilots and 11 passengers on board, was en route to Kokoda airstrip after taking off from Port Moresby. Prior to the accident the crew were manoeuvring the aircraft within the Kokoda Gap, probably in an attempt to maintain visual flight in reported cloudy conditions. Witnesses at Misima village stated that they heard an aircraft fly near their village, but that they could not see the aircraft as the area was covered by cloud. They reported that, shortly after, there was a loud bang above their village and the sound of the aircraft stopped.

The aircraft crashed on the eastern slope of the Kokoda Gap at about 5,780 ft above mean sea level in heavily-timbered jungle about 11 km south-east of Kokoda airstrip. It was destroyed on impact, and there were no survivors.

The investigation concluded that the accident was probably the result of an otherwise airworthy aircraft being unintentionally flown into terrain, with little or no awareness by the crew of the impending collision.

As a result of the investigation, the AIC issued a safety recommendation in respect of the installation of cockpit voice recorders (CVR) in PNG aircraft with a seating capacity of 18 or more passengers.

The Civil Aviation Safety Authority of PNG (CASA PNG) intends legislating to require the installation of CVRs in turbine-powered aircraft with seating for more than nine passengers. CASA PNG has also established a principal medical officer position and has advised of action to move responsibility for the administration of the PNG mandatory occurrence notification system to the AIC PNG.

The aircraft operator has taken extensive proactive safety action in response to the risk of inadvertent flight into cloud while employing visual flight procedures. ■

Aviation Safety Investigator

Managing Partial Power-Loss

For a pilot, losing engine power after takeoff ranks with the worst things that can happen in a single engine aircraft. Understandably. You can easily imagine a situation – say, on mid upwind over a factory or approaching powerlines and trees – where you'd give anything for even a bit of power. And yet a new ATSB research report shows that partial-engine power-loss actually causes more fatalities than a complete engine failure.

Managing Partial Power-Loss After Takeoff in Single-Engine Aircraft is the newest information booklet in the ATSB's 'Avoidable Accidents' series. It came about after a spate of fatal accidents where witnesses reported that the engine had not failed fully. Such power-losses are a largely unexplored topic, and not just in research, but in training scenarios as well. This is despite the fact that partial power loss events occur three times more frequently than complete engine failures during takeoff and initial climb.

From 1 January 2000 to 31 December 2010, there were 242 occurrences (nine of which were fatal) reported to the ATSB involving single-engine aircraft sustaining a partial engine power loss after takeoff[1] and 75 occurrences (none of which were fatal) reported as sustaining an engine failure after takeoff.

Partial engine power loss occurs when the engine is providing less power than commanded by the pilot, but more power than idle thrust. This kind of power loss is actually more complex than a complete failure, and it can be much harder to stay ahead of the aircraft. The pilot is thrust into a situation where the engine is still providing some power, but it may be unreliable, and the power level might be difficult to access. As a result, pilots are uncertain about the capabilities of their vehicle, and what their options are – a situation that has led to loss of aircraft control.

And because it's not a substantial part of flight training, pilots don't tend to think about it beforehand. Compared to the spectre of total loss of power, they don't muse about how they would react in such a scenario. And, as a result, when it does happen, it can turn into disaster very easily.

The first way to combat a partial power-loss is simply to think about it before it happens. Just by acknowledging the possibility, and establishing different strategies that you might employ, you're giving yourself an advantage. Establishing procedures, however, offers a far greater advantage. By planning for this ahead of time, you reduce your mental workload, and you have greater confidence.

Many of the causes of partial power loss after takeoff events could have been identified, thereby preventing the partial power loss during pre-flight checks. Aircraft physical inspection, engine run ups and on takeoff engine checks are vital barriers that can serve to prevent the possibility of partial power-loss. Many instances of partial power-loss have been found to be fuel-related and spark plug related.

If, however, despite these precautions, you still experience a partial power-loss, then you need to respond immediately. And taking no action is not an option in these circumstances. Most fatal and serious injury accidents resulting from partial power loss after takeoff are avoidable. The first priority is to maintain control. You might be turning back to the aerodrome or conducting a forced landing, but as long as you are maintaining glidespeed and no more than a moderate bank angle, you retain some modicum of control, and arriving at the ground in a controlled flight rather than after a stall and or spin could make all the difference.

Partial Power-loss is a complicated issue, and the ATSB's publication, *Managing Partial Power-Loss After Takeoff in Single-Engine Aircraft* examines it in-depth, breaking it down into the same sequence of events as if conducting a flight. The information booklet is available for free on the ATSB website at www.atsb.gov.au ■

1 Partial power loss occurrences include those where a total engine failure was preceded by a partial power loss.

Pre-flight: Check your electrical power supply

A pilot who took off without power to the aircraft's primary flight instruments likely became disoriented and lost control of the aircraft, according to an ATSB report.

On 9 April 2008, a Fairchild Industries Inc. SA227-AC (Metro III) aircraft, registered VH-OZA took off from Sydney on a late night freight charter flight to Brisbane. Shortly after, the aircraft turned right despite being instructed by air traffic control to turn left. The pilot reported that he had a 'slight technical fault' but no other transmissions were received.

Radar data showed the aircraft turning right and then left, followed by a descent and climb, a second right turn and a second descent at over 10,000 feet per minute before the aircraft disappeared from the radar.

A search operation found a small amount of aircraft wreckage floating in the ocean. The pilot likely died in the accident. The aircraft was destroyed.

Cockpit voice recorder on the ocean floor

Flight data recorder, popularly referred to as the 'black box'

There was no evidence of a midair breakup of the aircraft. Both of the aircraft's on-board flight recorders were recovered from the ocean floor, but they only contained data from a previous flight—not the accident flight.

The ATSB investigation found that the pilot took off without any alternating current electrical power to the aircraft's primary flight instruments. This included the pilot's artificial horizon and both flight recorders. Without a primary attitude reference during night takeoff, it is likely that the pilot became disoriented and lost control of the aircraft.

The investigation identified that the pilot's Metro III endorsement training had not been conducted in accordance with the operator's approved training and checking manual.

As a result of the accident and audits by the Civil Aviation Safety Authority, the operator has taken action to improve its safety and training operations. This includes:

- rewriting their operations manual
- retraining pilots to meet the operator's endorsement training requirements
- establishing a new safety committee.

The ATSB's investigation report *Loss of control – Fairchild Metro III, VH-OZA, 19 km SE Sydney, NSW, 9 April 2008* is available at www.atsb.gov.au ■

Pilots urged: 'stay focused around powerlines'

Agricultural pilots are being reminded of the dangers associated with flying near wires following the release of an ATSB booklet today.

The booklet, released in association with the Aerial Agriculture Association of Australia, highlights recent wirestrike accidents that occurred while pilots were conducting spraying activities.

Importantly, the report provides ways for pilots to minimise the risk of striking a powerline while conducting aerial operations.

ATSB General Manager of Strategic Capability, Mr Julian Walsh, said that in the majority of wirestrike accidents the pilots had known of the powerlines before they struck them.

'Typically, pilots have been working around the same wires in the hours before a wirestrike accident,' Mr Walsh says.

'Due to a change of spraying plans or a clean-up run once a paddock has been sprayed, the pilot's focus is temporarily shifted away from the task of identifying the location of wires.'

The booklet provides methods for pilots to minimise the risk of striking wires while conducting aerial operations. These are:

- setting client expectations so that they are clear that safety comes first
- conducting an aerial reconnaissance before spraying and extra aerial reconnaissance before the cleanup run
- reassessing the risks when plans change
- avoiding unnecessary distractions and refocussing when distracted
- keeping vigilance limitations in mind
- actively looking for wires
- managing operational pressures including not accepting tasks that are beyond your personal minimums
- having a systematic approach to safely managing wires.

The report also highlights the role of landholders and utility owners in contributing to safety. This includes installing markers on wires, particularly where regular low-level flying takes place. ■

Report confirms Qantas A380 engine failure event sequence

An interim ATSB investigation report has confirmed the sequence of events that led to the 4 November 2010 uncontained engine failure on board a Qantas A380 aircraft over Batam Island, Indonesia.

The report also sets out how, as a result of the investigation to date, Rolls-Royce, affected airlines and safety regulators have taken action to ensure the continued safe operation of A380 aircraft.

The report highlights how the intermediate pressure turbine disc in the aircraft's No. 2 engine had been weakened by an oil fire. As a result, the disc separated from its shaft, increased its rotation speed and broke into several parts. Sections of the fractured disc and other engine components penetrated the aircraft's left wing and a number of other areas on the aircraft, resulting in significant structural and systems damage.

The oil fire that weakened the disc was due to a manufacturing defect in an oil feed pipe. That defect resulted in fatigue cracking in the pipe, so that oil sprayed into an engine cavity where it ignited because of the high air temperature.

The report also shows how some of the extensive flight data recovered in the first stage of the investigation has been used to program a simulation of how the aircraft handled following the accident. This has helped investigators to understand better the aircraft's handling and performance.

The simulation was part of a broader exercise to understand the extent and consequences of the airframe and systems damage to the aircraft and the consequences for flight crew workload. The findings from this continuing work will provide valuable safety lessons for future operations.

The ATSB will continue to work with international safety agencies and other organisations to gather and compile the large amount of complex factual information required to complete the investigation. Included in this work will be:

- testing and analysing the black-coloured soot residue found in the left wing fuel tank
- analysing the flight simulation test data
- continuing to review the quality control and quality assurance system affecting the engine design and manufacturing process
- reviewing the aircraft's maintenance, including engine workshop visits.

The aircraft is currently in Singapore awaiting repair.

Given the highly complex nature of this investigation, the final ATSB report is expected to be released in May 2012.

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

Fact sheet for General Aviation Pilots

The Australian Transport Safety Bureau (ATSB) has issued a fact sheet reminding pilots of the risks associated with operations in uncontrolled airspace. This warning comes as the result of a significant increase in reports of situations involving near miss incidents. The ATSB has received many notifications from pilots reporting how they have suddenly realised that another aircraft is flying dangerously close to them in uncontrolled airspace.

The fact sheet notes that, surprisingly, just as many near miss incidents are reported for en route aircraft as those in airspace close to airports. 'Near airports, planes are operating in closer quarters,' explains Martin Dolan, Chief Commissioner of the ATSB, 'so you might expect to hear about aircraft getting too close to each other, but it's surprising that there are just as many reports from aircraft that are up there cruising along, going from one place to another.'

In response, the fact sheet describes the factors that increase the chance of these dangerous situations. The core recommendation on how to avoid other aircraft when outside controlled airspace is to ensure that pilots are aware of each other in plenty of time, using whatever systems are available.

'This may sound like an obvious message,' says Dolan, 'but our figures are indicating that it's not always happening – that pilots aren't always advertising their presence, when in fact they could be.' In fact, there were twice as many near-miss notifications where pilots had no prior warning of other aircraft in their vicinity, compared with situations when a pilot received an alert by radio, or from a traffic avoidance system like TCAS.

There are a number of specific strategies in the fact sheet to help pilots announce their presence in uncontrolled airspace more effectively. Hopefully, this may help cut down the number of situations where pilots suddenly find that another aircraft has come too close. ■

Close flying highlighted in ATSB bulletin

ATSB investigation AB-2010-040

The ATSB has released its latest bulletin of short investigations, covering a variety of occurrences. Among them, it highlights five instances of aircraft coming too close to each other.

'Two of those occurrences were 'breakdowns of separation,' taking place in airspace that was under the control of Air Traffic Control officers, which has carefully defined separation standards to keep aircraft a set distance apart.

Several safety actions have come out of these occurrences, including the establishment of an awareness program for Air Traffic Controllers, and a systemic review by Airservices Australia.

Mr Joe Hattley, the ATSB's Assistant General Manager of Aviation Safety Investigations says the investigations bulletin provides a useful resource for the aviation industry to help improve safety.

'The bulletin covers a range of the ATSB's shorter investigations and highlights valuable safety lessons for pilots, operators and safety managers,' Mr Hattley says.

Other investigations covered in the bulletin included a depressurisation event, two instances of total power loss and a situation in which fumes and smoke appeared in an aircraft's cockpit. As a result of a wirestrike, an aircraft operator will annotate powerline information onto their topographic survey plans.

Released quarterly, the bulletin provides a summary of the less-complex factual investigations conducted by the ATSB. The results, which are based on information supplied by organisations or individuals involved in the occurrence, detail the facts behind the event, as well as any safety actions undertaken or identified. The bulletin also highlights important safety messages for the broader aviation community, drawing on earlier ATSB investigations and research.

Aviation Short Investigation Bulletin: First Quarter 2011 is available on the ATSB website at www.atsb.gov.au ■

Bushfire fighting now safer

ATSB investigation AO-2009-077

NSW's bush fire operating procedures have been improved following the ATSB's investigation into a fatal helicopter accident.

On 9 December 2009, the pilot of a Bell Helicopter 206L-1 LongRanger, registered VH-MJO, was flying a fire-fighting support flight under visual flight rules (VFR) in the Dorrigo area, NSW.

Shortly after takeoff, low cloud came in and the pilot lost all visual reference with the horizon and the ground. The pilot became disoriented and the helicopter crashed into the ground. The passenger died and the pilot was seriously injured.

The accident showed how quickly a pilot can lose situational awareness and aircraft control when all visual reference with their surroundings is lost. Pilots should err on the side of caution when considering visual operations in marginal weather conditions, especially when conditions can change rapidly.

The ATSB's investigation found that the helicopter landing area was occasionally subjected to rapidly moving fog or low cloud that increased the safety risk of flights under VFR. The National Parks and Wildlife Service closed the helicopter landing site at the Dorrigo Rainforest Centre shortly after the accident.

Following the accident, the National Parks and Wildlife Service, the NSW Rural Fire Service and other NSW fire-fighting authorities conducted a full review of the Fire Agencies Bush Fire Aviation Standard Operating Procedures. A number of safety actions have been initiated as a result of the review, including:

- developing guidelines for helicopter landing areas that are regularly used during bush fire operations
- identifying potential hazards for each helicopter landing area
- compiling a Bush Fire Helicopter Landing Area directory
- conducting a full audit of the helicopter operator before awarding them any further contract work.

The investigation report is available at www.atsb.gov.au ■

Turbulences catches pilot off-guard

ATSB investigation AO-2010-008

An incident at Canberra Airport in which an aircraft experienced severe turbulence has reinforced the potential safety benefits of the formation of a national airport safety group.

On 31 January, 2010 a Grumman Traveller AA-5 aircraft was flown on a private flight from Temora to Canberra. The pilot reported that, during the final approach to the runway at about 150 ft above the ground, the aircraft experienced severe turbulence. This resulted in a loss of control, causing an uncommanded roll to the right. The pilot rapidly regained control, and landed.

The ATSB determined that the wind conditions on the day and the position of two buildings about 220 m and 290 m upwind from runway 12 at Canberra probably combined to produce the turbulence. There were no standard criteria for assessing the potential local wind effect of aerodrome building developments on aviation operations, and no national building codes for aerodrome developments that address the phenomena of building-induced turbulence.

The airport operator had commissioned pre-construction assessments of the two buildings that concluded that the buildings would not result in adverse wind effects. This conclusion was based partially on the assessment that use of runway 12 was unlikely in northerly wind conditions. However, operations to that runway remained possible in those conditions, and there was no alert to affected pilots about possible risk.

Subsequent to this occurrence, the National Airports Safety Advisory Group was established. Its role is to examine airport planning issues, including the potential for building-induced local wind effects on aircraft operations. The group will also develop a set of universal guidelines and policy material.

Airservices Australia is also progressing the installation of wind shear detection technologies at several airports, which may include Canberra Airport.

The investigation report is available at www.atsb.gov.au ■

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.

Testing of instruments in IFR aircraft

Report narrative:

The reporter expressed safety concerns that CASA Airworthiness Directive (AD/INST/9), testing requirements for instruments in IFR aircraft allows operator's to elect to carry out one of two options for the periodic testing of flight instruments on IFR aircraft. The reporter believes that most operators would elect the first option as it is less labour intensive, despite needing to be carried out every 2 years, as opposed to 3 years with option 2, but only checks the pressure altimeters and not the whole system. Option 1 does not confirm that the whole system is operational and airworthy. Latent defects may remain undetected until that part of the system is needed (in an emergency) or the system fails.

The reporter believes that CASA is aware of the problem with this airworthiness directive and some CASA staff agree that the airworthiness directive needs to be changed to remove option 1.

Action taken by REPCON:

REPCON supplied CASA with the de-identified report. The following is a version of the response that CASA provided:

> CASA published Airworthiness Bulletin (AWB) 31-004 in February 2008. This AWB addresses the concerns raised in this REPCON report concerning the two options presented in AD/INST/9 for the testing of flight instruments. The AWB also explains the relationship between the AD and Civil Aviation Regulations (CAR) 1988 i.e.:
>
> - When an operator elects to use option 1 in AD/INST/9 for the testing of pressure altimeters to Federal Aviation Regulation Part 43 Appendix E they must also ensure that the requirements of CAR 41 are met.
> - CAR 41 (2) states that 'a person must not use a class B aircraft in an operation if there is not a maintenance schedule for the aircraft that includes the provision for the maintenance of all aircraft components from time to time included in, or fitted to, the aircraft'.
> - Electing to use option 1 in the AD instead of option 2 does not remove the requirement to ensure the serviceability of all other aircraft instruments and instrument systems as per CAR 41.

Operation without a flight attendant

Report narrative:

The reporter expressed safety concerns that a company aircraft operated two sectors without a flight attendant onboard; there were approximately 10 passengers on board.

Action taken by REPCON:

REPCON supplied the operator with the de-identified report. The following is a version of the response provided by the operator:

> This subject has already been addressed with CASA. All actions have been accepted by CASA and this issue has been closed out accordingly.

REPCON supplied CASA with the de-identified report and a version of the operator's response. The following is a version of the response that CASA provided:

> CASA has reviewed the report and contacted the operator concerned. CASA is aware of the issue and is satisfied that the matter has been addressed.

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?

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