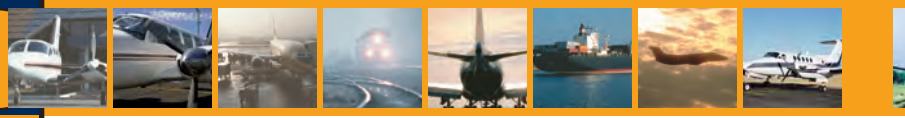
Australian Government
Australian Transport Safety Bureau

The Australian



Executive Director's Message

On 2 December 2008, the Minister for Infrastructure, Transport, Regional Development and Local Government released the National Aviation Policy Green Paper. One of the Paper's stated objectives was to strengthen the governance arrangements for the Australian Transport Safety Bureau (ATSB).

The Government has decided to establish the ATSB as a statutory agency and to introduce a Commission structure to enhance its independence. This will ensure that it continues to conduct the most thorough investigations possible and to foster appropriate safety action. It will also enhance the quality of the Bureau's relationship with the industry and the aviation community. Legislative amendments to the Transport Safety Investigation Act 2003, to give effect to the governance changes, are expected to be introduced into Parliament in early 2009, with the new Commission to be in place by 1 July 2009.

The Government is currently developing an Aviation White Paper to guide the aviation industry's growth over the next decade and beyond. The Government aims to give industry the certainty and incentive to plan and invest for the long term, to maintain and improve our excellent aviation safety record, and to give clear commitments to travellers, airport users, and the communities affected by aviation activity. The Government is now inviting comments on the Aviation Green Paper to be considered in the development of the White paper which is expected to be released in the second half of 2009.

The Green paper is available on the internet, at <http://www.infrastructure.gov.au/aviation/nap/index.aspx.>

Meanwhile, on the legislation front, the Aviation Legislation Amendment (2008 Measures No.2) Bill 2008 is currently before the Parliament. This Bill contains important measures to address matters concerning the maintenance of Cockpit Voice Recorders and the reporting of safety incidents that arose out of the ATSB's investigation of the fatal accident at Lockhart River on 7 May 2005. Both sets of amendments seek to ensure Australia is in the best possible position to learn from accidents and incidents.

Kym Bills, Executive Director

Aircraft depressurisation – what cabin crew need to know

Depressurisation, also called decompression, is the reduction of atmospheric pressure inside the cabin of a pressurised aircraft. Aircraft depressurisation events are rare, but they can occur with little or no warning.

An ATSB safety bulletin for cabin crew, published in January 2009, provides an overview of aircraft depressurisation events, highlighting key information that cabin crew should know in the event of an aircraft depressurisation or failure to pressurise. The aim of this bulletin is to increase cabin crew's knowledge about depressurisations and to supplement their airline's emergency procedures.

A review of the ATSB's aviation safety database identified 310 accidents and incidents between September 1998 and August 2008 where a pressurisation problem occurred. High capacity passenger aircraft were involved in 124 of those occurrences.

The public's perception of depressurisations is of rapid depressurisation, in which there is a sudden change in cabin pressure causing objects to be 'sucked' out of the aircraft. Thankfully, rapid or explosive depressurisations and the significant aircraft damage associated with them are very rare. Only two Australian accidents since 1998 involved a rapid or explosive decompression.

However, a real danger lies in gradual or subtle depressurisations. These are caused by a slow air leak from the pressurised cabin, such as through an improperly sealed door. As gradual depressurisations occur over a longer time, they can be difficult to detect before oxygen masks fall from the cabin ceiling. Sensors fitted to commercial aircraft will provide the flight crew with a cockpit warning if the air pressure in the cabin drops to the equivalent of 10,000 feet. Passenger oxygen masks are designed to automatically deploy before cabin pressure reaches 15,000 ft.

Once a pressurisation problem is identified by the flight crew, all cabin crew and passengers should immediately don their nearest oxygen mask. Cabin crew should always put their own mask on before instructing or helping others with their masks, as there is not always time to assist others before becoming unconscious. Staying calm and breathing normally are important, as hyperventilating uses up more oxygen. Once breathing through an oxygen mask, cabin crew should secure themselves as best as possible. Cabin crew must put their safety first by remaining secured. If a crew member puts their safety at risk and is injured, there will be one less trained safety professional who can assist if the situation escalates.

The ATSB safety bulletin also provides supplementary information to cabin crew on common physical effects of depressurisation and how to use an oxygen mask. ■

ATSB Research and Analysis Report AR-2008-075(2)

Aviation Safety Investigator

Cirrus changes parachute system design

On 5 February 2007, a Cirrus SR22 aircraft, registered VH-HYY, with a pilot and one passenger on board, was being operated on a private flight from Canberra, ACT to Bankstown, NSW. As the aircraft approached the Cecil Park area, at a height of 800 ft above ground level, the pilot reported to air traffic control (ATC) that the engine had lost power and he was attempting a forced landing.

The aircraft was fitted with a Cirrus Airframe Parachute System (CAPS) designed to recover the aircraft and its occupants to the ground in the event of an in-flight emergency. The pilot informed ATC of his intention to deploy the CAPS, after which no further calls were received from the pilot.

Soon after, the aircraft impacted terrain close to the M7 motorway. Witnesses reported that the aircraft appeared to be attempting to land on the motorway but, just prior to impact, it veered away from the road to the right and struck the ground in a nose-down, right wing-low attitude. The aircraft was seriously damaged and both occupants sustained serious injuries.

Some of the emergency services personnel who attended the aircraft accident had no prior knowledge of the CAPS and the potential dangers it posed, if it had not been deployed. The ATSB warned the attending police site controller of the existence and potential danger of the CAPS. Following consultation with the ATSB and an aircraft manufacturer's representative, emergency service personnel subsequently cut through the roof of HYY to remove the injured occupants.

An examination of the wreckage indicated that the aircraft struck several trees before heavily impacting rising terrain. The impact completely detached the right main landing gear assembly and fractured the fibreglass laminate structure of the left main landing gear. Both wings were extensively damaged and both internal wing fuel tanks were breached. The rear fuselage and empennage assembly broke away from the main fuselage at a point behind the rear baggage compartment and came to rest alongside the main wreckage. The flight control cables between the rear fuselage and the main wreckage remained intact.

The investigation determined that the engine stopped due to the loss of a blanking cap from the un-metered fuel pressure test port in the engine fuel system. Testing showed that the engine would not operate with the cap missing. The investigation revealed that, instead of the normal steel cap, a plastic blanking cap had probably been inadvertently fitted to the test port on the engine during maintenance and that the plastic cap had detached from the test port just prior to the accident.

The pilot had activated the CAPS at an estimated height of 90 to 120 ft above ground level, well below the aircraft manufacturer's recommended decision altitude for successful parachute deployment. The rocket fired, however the parachute did not deploy and the rocket became entangled in the aircraft's empennage. It is possible that the entanglement of the rocket and deployment harness around the tailplane and flight controls may have affected the controllability of the aircraft, resulting in the aircraft diverting from the intended flight path.

Following examination of the CAPS components from this aircraft and further functional testing of production CAPS components in the US, the aircraft manufacturer issued an Alert Service Bulletin incorporating design changes to the CAPS in the worldwide fleet of Cirrus aircraft.

The aircraft and engine manufacturers are also making a number of changes to their processes and procedures based on lessons learnt from this accident.

The Australian Transport Safety Bureau will forward copies of this report to the relevant state emergency authorities to alert them to the dangers posed by ballistic parachute systems in light aircraft. ■

ATSB Investigation Report 200700361

Investigation briefs

Collision with terrain

Occurrence 200607478

On 9 December 2006, the pilot of an Air Tractor Inc. AT802A aircraft, registered VH-CJZ, was conducting night agricultural spraying operations under the night visual flight rules, at a property 19 km NE of Collarenebri, NSW. In conjunction with a pilot in another agricultural spraying aircraft, the Air Tractor pilot was utilising an airstrip located on the property as a base for the operation. At about 2140 Eastern Daylight-saving Time, the aircraft was returning to the airstrip when it impacted the ground 1.4 km from the landing strip. The pilot was fatally injured. The aircraft was destroyed by impact forces and a post-impact fire.

Earlier, the pilot had made a 20-minute positioning flight from the operator's base at Wee Waa, NSW, to the airstrip. The pilot then conducted two 30-minute spraying flights, with a short period on the ground. The aircraft remained running while that replenishment was conducted. The accident occurred when the pilot was returning at the conclusion of the second flight.

Examination of the aircraft wreckage revealed no evidence of an in-flight fire or any mechanical fault with the aircraft, engine, or systems which may have contributed to the occurrence. The intensity of the post-impact fire, deformation to the integral wing fuel tank structure and ground marks, indicated that there was sufficient fuel on board the aircraft for the operation. There was no evidence that the aircraft struck trees or powerlines.

It could not be conclusively determined why the aircraft impacted the ground. It was possible that the pilot may have experienced a medical event that was not evident during the post-mortem medical examination. However, based on the evidence available, it is probable that the pilot experienced spatial disorientation and a subsequent loss of control of the aircraft resulting in it impacting the ground. ■

Collision with terrain

Occurrence 200707066

At about 0730 Western Daylight-saving Time on 17 November 2007, the wreckage of a Cessna Aircraft Company C172M aircraft, registered VH-TCS, was discovered on the side of a hill, at Uaroo Station, in the Pilbara region of WA, about 500 m from the property air strip. The aircraft had been destroyed by impact forces and a post-impact fire. The pilot, the sole occupant, was fatally injured.

Information obtained from persons who knew the pilot indicated that he had most likely departed from the airstrip during the morning of 16 November 2007, however, the actual time of the takeoff could not be determined. There were no reported witnesses to the takeoff, any subsequent flight, or the accident. Tyre marks made by the aircraft indicated that the aircraft had departed from runway 27 to the west.

There was no evidence of an engine or aircraft system problem which could have contributed to the accident. There was no evidence that the pilot had a pre-existing physiological condition that could have contributed to the accident. The aircraft manufacturer's tabulated take-off data showed that the aircraft should have had sufficient performance to take off from runway 27 and climb clear of terrain.

There was evidence to indicate the possibility of adverse meteorological phenomena such as strong wind gusts and 'willy-willies' in the area on the days before, during and subsequent to the accident. The willy-willies were reported to be difficult to see, forming and dissipating rapidly, and travelling in the same direction as the prevailing wind. The air within willy-willies is very unstable, with rapid rising thermals and downdrafts created.

While the reason that the aircraft impacted terrain could not be conclusively determined, it is probable that the aircraft encountered adverse meteorological phenomena such as strong wind gusts and willy-willies, just after takeoff. ■

Collision with water

Occurrence 200707039

On 17 November 2007, the owner-pilot of a Cessna Aircraft Company C337G, registered VH-CHU, was conducting a private flight in accordance with the visual flight rules (VFR) from Moorabbin Airport, Vic. to Merimbula, NSW. The pilot, who had three passengers onboard, had indicated that he would be tracking along the coast. The aircraft did not arrive at Merimbula and on 19 November 2007 aircraft wreckage and three of the deceased occupants were found on a beach between Venus Bay and Cape Liptrap, Vic. There were no survivors.

The investigation found that while manoeuvring over water at low level in conditions of reduced visibility, the pilot probably became spatially disorientated and inadvertently descended into the water. A contributing factor was the pilot's lack of instrument flying qualification and minimal instrument flying training and experience.

The operation of visual flight rules flights into instrument meteorological conditions (IMC) continues to be a significant risk factor in general aviation, but there are a number of countermeasures which can be used to reduce the risk. The Civil Aviation Safety Authority (CASA) advised, in relation to VFR into IMC safety promotion activities, that in 2005 and 2006 they conducted a number of special workshops for private and commercial pilots, which included how to avoid weather emergencies, what to do if caught out in worsening weather, and how to maximise chances of survival if a crash occurred.

Media discs (CDs and DVDs) produced by CASA related to weather and decision making, *Weatherwise, Weather to fly, Inflight decision making* and *Setting your own standards* are available. Also available is a VFR into IMC 'briefing-in-a-box' for flight schools and a video titled *178 seconds to live*. Furthermore, a number of products with a focus on human factors such as airmanship and decision making were being developed. ■

Loss of control

Occurrence 200607687

On 20 December 2006, a Kawasaki KH4 helicopter lost collective pitch control and impacted terrain while performing agricultural aerial spray operations approximately 21 km NE of Mount Gambier, SA. The helicopter was substantially damaged but the pilot was uninjured. When the accident site was surveyed, the main rotor mast and main rotor blade assembly were found to have separated from the helicopter. They were located a short distance away.

Examination of the wreckage revealed that the helicopter's main rotor mast thrust bearing had failed catastrophically in flight. That bearing was a critical item for safe operation and continued airworthiness. It supported the full weight of the helicopter and transferred thrust loads generated by the main rotor blades. The bearing had performed satisfactorily for a considerable time in service and it was not considered a premature failure.

The investigation was unable to establish conclusively the factors that led to failure of the mast bearing. No evidence was found of manufacturing or material defects. Nor was there any evidence of improper installation procedures or maintenance practices.

In view of the apparent absence of similar failures in Australian and North American databases, and the absence of any contrary evidence, the failure appears to be an isolated event and unlikely to be an indicator of an airworthiness issue with the helicopter type.

Despite the low probability associated with a mast bearing failure of this type, the consequences of such an event could have been fatal for the pilot onboard. This report has been provided to Australian operators and maintainers of Kawasaki KH4 and Bell 47G3 series helicopters as a future alert for this type of occurrence. ■

Uncontained engine starter failure

Occurrence 200706589

On 24 October 2007 at Darwin aerodrome, an Airbus A330-300, registered VH-QPE, made two unsuccessful attempts to start the right engine. A review of the Quick Access Recorder data indicated that the first automatic start attempt lasted 1 minute 10 seconds and resulted in an engine start fault and no N2 rotation.

The second attempt was a manual start lasting 6 minutes, at which time smoke and sparks were observed from under the engine cowls. Subsequent inspection of the engine revealed an uncontained failure of the starter turbine and secondary damage to the integrated drive generator.

The aircraft was fitted with two General Electric CF6-80E1-A3 turbofan engines. The starter, part number 3505468-4, was reported to have been in service for 14,988 flight hours and 2,428 cycles.

The starter was returned to the manufacturer to conduct a failure investigation

The starter manufacturer's internal investigation report of the uncontained starter failure found that the damage sustained by the starter components was consistent with a crash engagement. Crash engagements result in significant damage to the clutch, and can also damage the overrunning bearing and lead to further starter damage.

The failure scenario provided by the starter manufacturer noted that the crash engagement resulted in the overrunning bearings being damaged, with continued normal operation cycles contributing to further bearing deterioration. Although operation of the starter in this condition with no load for an extended period of time ultimately resulted in the starter failure, the starter was designed to separate the blades from the turbine disk and contain them in such an event. Damage to the surrounding components therefore occurred because the starter design failed to contain the separated turbine blades.

The manufacturer has proposed corrective actions involving design changes to the starter, to reduce the likelihood of uncontained starter events. ■

Rotor strike

Occurrence 200704706

On 24 July 2007, at 1500 Central Standard Time, a Robinson R22 Beta helicopter, registered VH-VHQ, with the pilot as the sole occupant, departed from a helipad at Maryfield Station, NT, in order to recommence cattle mustering activities. Visitors to the station, who had recently participated in a number of short local flights, were still in the general area of the helipad during the departure.

The pilot reported that, during the initial climb after takeoff, and at a height not above the tops of the surrounding trees, the helicopter was struck by a gust of wind that resulted in height loss and activation of the helicopter's 'low RPM' warning horn.

In response to the warning horn, the pilot reported that he opened the throttle, with the effect of over-riding the engine RPM governor, lowered the collective lever, and pushed forward on the cyclic stick.

The pilot stated that the low RPM resulted in a loss of altitude and airspeed before he was able to recover control of the aircraft.

During the recovery manoeuvre by the pilot, one of the visitors was struck in the head by the helicopter's main rotor and was fatally injured.

On-site examination of the helicopter, its engine and flight control systems found nothing that would have contributed to the development of the accident. Results obtained during the ground test of the engine and its associated systems following the accident, suggested that the non-completion of three overdue routine maintenance items had similarly not contributed to the accident.

This accident highlighted the hazards associated with conducting helicopter operations in close proximity to people and the need for positive coordination and control of those people at all times. ■

REPCON briefs

Australia's voluntary confidential aviation reporting scheme

REPCON is established under the Air Navigation (Confidential Reporting) Regulations 2007 and allows any person who has an aviation safety concern to report it to the ATSB confidentially. Unless permission is provided by the person that personal information is about, the personal information will not be disclosed. Only de-identified information will be used for safety action. 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) acts of unlawful interference with an aircraft;

(c) industrial relations matters;

(d) conduct that may constitute a serious crime.

Note 1: REPCON is not an alternative to complying with reporting obligations under the Transport Safety Investigation Regulations 2003 (see www.atsb.gov.au).

Note 2: Submission of a report known by the reporter to be false or misleading is an offence under section 137.1 of the Criminal Code.

If you wish to obtain advice or further information, please call REPCON on 1800 020 505.

Operator maintenance human factors training-update

R200800035

Report narrative:

The reporter expressed concerns about the operator's engineering human factors training. The refresher training is conducted on-line using a training package with an assessment test. Individuals are required to conduct the training in their own time and it is expected to take approximately 2 hours to complete. The reporter was informed that the training is required to comply with European standards, European Aviation Safety Agency (EASA) 145 and the soon to be introduced Australian legislation, Civil Aviation Safety Regulations (CASR) 145. The reporter claims to have observed a range of shortcuts being taken during the assessment test including: the test being conducted by a different person; sharing of answers; and the test being completed without reading the training material. In addition, the reporter claims that some managers indicated they did not care how the training was completed as long as it was recorded as being completed. The reporter expressed concerns that computer-based training for human factors is inappropriate, and the lack of adequate time allocated to complete the training means that shortcuts might/will be taken.

Reporter comment: The human factors training needs to be carried out again in a class room situation otherwise the whole training package has been a 'box ticking' process.

REPCON comment:

This report was published in the November December 2008 Flight Safety Australia magazine including the operators response. Subsequent to that response, the ATSB has received a response from CASA which is included below.

REPCON contacted CASA and supplied them with the de-identified report and a version of the operator's response. CASA advised that human factors training is included in the Civil Aviation Order (CAO) 100.66 (Module 9), and was introduced in February 2007 as the precursor of the proposed Civil Aviation Safety Regulations (CASR) Part 66 (Personnel Licensing) and 147 (Maintenance Training Organisations). The CAO is voluntary for those individuals and industry organisations that may benefit from early access to the licensing and training based on the EASA Category A, B1 and B2 licence outcomes. The CAO is not mandatory as it operates in parallel with the existing Civil Aviation Regulation 31 licensing regime. However, if a decision is made to use the CAO, all the requirements for the licence must be met including human factors training.

CASA also added that in terms of the proposed future human factors training, there is a requirement that all future licence holders (CASR Part 66 licences) receive human factors training as part of gaining a licence and that maintenance organisations (CASR Past 145) provide their staff with initial and ongoing (refresher) human factors training. Training for CASR Part 66 licence issue is delivered by CASR Part 147 (Maintenance Training Organisations) using national competency-based standards. An underpinning knowledge of human factors is required for an individual to be assessed as competent before they can be issued and initial licence. These standards are available on the National Training Information Service website www.ntis.gov.au.

The foundation of CASR Part 145 is to replicate EASA Part 145 as far as practicable for use in Australia. Therefore, it is not expected that the area of human factors will change from the requirements that EASA currently require to comply with at 145.A.30(e) in their legislation. The Acceptable Means of Compliance and Guidance that EASA has published on 145.A.30(e), would allow for the development of a program to suit any prospective Australian 145 organisation. Until CASA Part 145 is effective in legislation, CASA do not have the regulatory powers to approve organisations inclusive of human factors training elements.

CASA also advised that the operator is one of the leaders in the country in this field and has established a very thorough system to deal with human factor issues and manage human factors training in maintenance-related areas.

It is also believed that the system has been independently reviewed by Boeing. The comment related to computer based training versus face-to-face is valid. There is a UK Civil Aviation Advisory Publication that identifies face-to-face facilitated training as preferable to online computer based training (CBT). Face-to-face facilitated training maximises the achievement of learning outcomes. Some CBT modules do not provide sufficient access to participant experiences and discussion. As the training in question in this instance is refresher training, CBT may be appropriate. Concerns about this approach might arise if the operator were not to follow its own published guidelines or standard operating procedures. From the response provided by the operator, it does not appear that this is the case.

Engine failure during takeoff update

R200800041

Report narrative:

The reporter expressed concerns about a Cessna 404 (C404) aircraft that experienced a series of engine failures during attempts to take off at an airport. The reporter claims that during the aircraft's first attempt to take off, an engine failed shortly after lift-off and the aircraft settled back onto the runway. After the engine was restarted, the aircraft was taxied back to the threshold. A further four attempts to take off were made with similar results. The reporter indicated that no checks were conducted to determine why the engine had failed.

REPCON comment:

This report was published in the November December 2008 Flight Safety Australia magazine including the operators response. Subsequent to that response the ATSB has received a response from CASA which is included below.

REPCON supplied CASA with the de-identified report and a version of the operator's response. CASA advised that they undertook an operational surveillance of the operator and intend to take no further action. CASA believes that there was a fuel vapour lock problem and have confirmed that there was only one engine failure during the initial takeoff. The pilot was aware of the problem and correctly diagnosed what had occurred and took acceptable action before completing a second takeoff. The operator had checked and adjusted the aircraft fuel system.

CASA also reported that two to three times a year, the operator's C404 engines experience 'bog down' which is caused by the ambient temperature and humidity conditions that occur in summer affecting the fuel system. This is a known issue and the operator maintenance organisation have a practice of checking the fuel pressures in the engine fuel injection system if a bog down is reported. The operator's C404 aircraft are checked if it happens and fuel pressures adjusted in accordance with the Aircraft Maintenance Manual and a Manufacturer's Service Bulletin which addresses this problem. After the summer, the engine fuel pressures are checked again and adjusted as necessary.

Catering loading procedures

R200800051

Report narrative:

The reporter expressed safety concerns about a cabin crew notice applicable to some of the operator's aircraft, which allows catering staff to start loading produce during refuelling operations as long as any obstruction can be pushed out of the way. The example given is towards door R2.The reporter believes that this is in direct contravention of CASA Civil Aviation Order (CAO) 20.9 that requires aisles and exits to be unobstructed during loading.

Reporter comment: CAO 20.9 requires that all exits be unobstructed while refuelling with passengers on board and pushing an item from door L2 toward door R2 would clear door L2 but obstruct door R2 if an evaluation was required.

REPCON comment:

REPCON contacted the operator and supplied them with a copy of the de-identified report. The operator responded that they were trialling new procedures for the disembarkation of passengers from the left rear of the aircraft and the cabin crew notice quoted in the REPCON report detailed the procedures utilised in that trial.

The operator also indicated that their investigation found the reporter had only selectively stated some of the procedures in that notice and so the report was not a true representation of the intended trial procedures. The reporter did not state that the notice stipulated the time when the caterers could board, that is, only after a significant number of passengers had disembarked. The procedures also defined what catering could be loaded while the remaining passengers were disembarking so that an 'obstruction' situation as detailed in Civil Aviation Order (CAO) 20.9, would not occur. The reporter also did not mention that the notice included specified procedures on other refuelling-related issues including, but not limited to, the requirements with the galley carts, stairs at the aircraft, precautionary disembarkation, refuelling zone requirements and related cabin crew responsibilities plus the duration and place for the trial.

The operator believes that the cabin crew notice was within and above the intent of CAO 20.9. The notice and procedures were retired when the trial finished over 5 months ago and the operator reported that they have reverted to the formal documented procedures in its manual.

REPCON reports received	
Total 2007	117
Total 2008	121
What happens to my report?	
For Your Information issued	
Total 2007	58
Total 2008	99
Alert Bulletins issued	
Total 2007	1
Total 2008	12
Who is reporting to REPCON?	
Aircraft maintenance personnel	31.0%
Air Traffic controller	4.0%
Cabin crew	2.0%
Facilities maintenance personnel /ground crew	0%
Flight crew	30.0%
Passengers	6.0%
Others*	28.0%

\# 29 Jan 2007 to 31 December 2008

* examples include residents, property owners, general public

How can I report to REPCON?

On line: ATSB website at <www.atsb.gov.au>
Telephone: 1800 020 505
by email: repcon@atsb.gov.au
by facsimile: 02 6274 6461
by mail: Freepost 600,
PO Box 600, Civic Square ACT 2608
For further information on REPCON, please visit our website <www.atsb.gov.au> or call REPCON on: 1800 020 505.