



Our plan for the year

We recently released our annual plan that highlights the ATSB's goals, targets and deliverables for 2012–13. The plan is important because it spells out what we'll do to make transport safer in Australia.

A significant part of the plan focuses on our safety awareness priorities for the aviation industry. These priorities reflect the broad safety concerns that come out of our investigation findings and from the occurrence data reported to us by industry.

You'll hear more about our safety priorities over the coming months. But it's worth briefly sharing with you what the ATSB sees as the main risk areas that need heightened attention from the Australian aviation community. They include:

- **Avoidable accidents**—GA pilots continue to die in accidents that are mostly avoidable. These accidents involve low-level flying, wirestrikes, flying visually into bad weather, mismanagement of partial power loss, and poor fuel management.
- **Handling of approach to land**—A worrying number of pilots are not adequately handling uncommon manoeuvres during their approach to land.
- **Data input errors**—Human error involving incorrect data entry continues to cause concern. In some cases, operators' flight management procedures are not catching these errors.
- **Safety in the vicinity of non-towered aerodromes**—Non-towered aerodromes continue to pose a risk to aircraft due to poor communication between pilots, ineffective use of see-and-avoid techniques and a failure to follow CTAF and other procedures.

We'll be regularly talking with industry about these concerns. We'll also dedicate a page on the ATSB website to give our safety awareness priorities greater visibility.

Martin Dolan
Chief Commissioner

Somatogravic illusion warning for pilots

In the wake of a fatal accident at Bathurst Island Aerodrome, the ATSB is alerting pilots to the somatogravic illusion – a powerful physiological illusion which can have dire consequences.

On 5 February 2011, the pilot of a Cessna 310R, was returning to Darwin from Bathurst Island. The pilot departed Bathurst Island Aerodrome at around 2140 CST and collided with terrain approximately one kilometre from the end of the runway. The pilot, the sole occupant of the aircraft, died in the accident and the aircraft was destroyed.

The ATSB investigators did not find any technical problems with the aircraft. However, the location of the wreckage, combined with the dark conditions, and the light load, suggested the pilot may have been affected by a powerful human physiological illusion – the somatogravic illusion.

The somatogravic illusion can develop under conditions of limited visibility, as the brain is unable to differentiate between the sensations associated with tilt and those associated with acceleration. Lacking outside visual references, pilots experience the sensation that they are climbing much more steeply than they actually are.

The illusion is generally felt at takeoff. The natural impulse is to lower the aircraft's nose in response to the sensation that it is climbing too steeply. However, this reaction increases the acceleration, compounding the illusion. If the illusion is not recognised and overcome, the pilot can continue to compensate for a steep climb that does not actually exist, with the aircraft ultimately descending into terrain.

Strategies for coping with the effect include recognising conditions under which it may occur, strict vigilance in the use of the attitude indicator (artificial horizon) as the primary source of aircraft pitch angle information, and correct instrument scanning techniques to verify the attitude and performance of the aircraft.

More information can be found in the ATSB Aviation Research and Analysis Report, *Dark night take-off accidents in Australia*. ■

Bulletin highlights safety lessons

The ATSB regularly releases a bulletin of short investigation reports. These reports provide useful safety messages and lessons.

Below are five of the occurrences from the most recent bulletin, issue 10.

AO-2012-008: Loss of separation assurance

On 8 January 2012, a Boeing B737-8FE and Boeing B737-838 were subject to a loss of separation assurance. The air traffic control's Short Term Conflict Alert was activated and the controller issued instructions that ensured vertical separation was maintained. The air traffic controller involved in the occurrence reported feeling mentally fatigued, following a very busy shift of continual high and complex workload, including multiple weather diversions and holding.

This incident highlights the need for awareness of the effects of high workload and sustained task complexity on performance. Taking regular breaks and monitoring performance is also an important safety lesson.

AO-2011-162: Breakdown of separation

On 9 December 2011, a breakdown of separation occurred between a S.O.C.A.T.A. Groupe Aerospatiale TBM 700 (VH-VSV) and a De Havilland Canada DHC-8. VH-VSV penetrated controlled airspace without a clearance, and the two aircraft came within 1.2 nautical miles at the same altitude. One of the key factors that led to this was a miscommunication between the pilot and the Bankstown air traffic controller.

This incident demonstrated various key points that pilots need to consider when



operating at unfamiliar aerodromes. Among them, that the use of correct phraseology is vital. Also, it is the responsibility of both the pilot and the controller to ensure that any omissions and discrepancies are clarified.

AO-2012-043: Runway incursion

At Taree Aerodrome, on 23 March 2012, as a Van's RV-10 took off, another aircraft, a SAAB 340B, entered the runway. The pilot of the RV-10 decided that since his aircraft was already airborne, the safest option was to continue the takeoff. He passed directly overhead the other aircraft at about 300 ft.

The key safety message from the subsequent investigation was that when operating outside controlled airspace, it is the pilot's responsibility to maintain separation with other aircraft, both in the air and on the ground. For this, it is

important that pilots utilise both alerted and un-alerted see-and-avoid principles.

AO-2012-002: Runway undershoot

A runway undershoot at Warnervale Aerodrome demonstrated the importance of establishing wind direction and strength using all available references, including those on the ground, while on approach. On 25 December 2011, due to the combination of too shallow an approach and a sudden loss of headwind, a Cirrus SR22 landed short of the bitumen runway.

This serious incident also highlights the unexpected nature of wind gusts and the need to identify an appropriate touchdown point on the runway that provides an adequate safety margin.

AO-2012-016: Partial power loss

On 25 January 2012, a Schweizer helicopter 300C suffered a partial power loss while returning to home base after a day's aerial spraying activities. The helicopter impacted the tree canopy before coming to rest on the ground between several large trees. The cause of the partial power loss was not determined, in part because the helicopter was seriously damaged by the fire. However, this accident highlighted the value of pilots wearing helicopter safety helmets. The pilot reported impact damage to both sides of his helmet, and remarked that the helmet had saved his life. ■

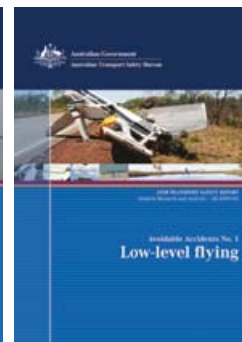
Aviation Short Investigation Bulletins are available at: www.atsb.gov.au

Prepare to live

The ATSB's Avoidable Accidents booklet series tells the stories of pilots whose simple mistakes have resulted in serious, and sometimes deadly, consequences.

Covering fuel management, low-level flying, partial power loss, flying in poor weather and wirestrikes, each publication can help pilots avoid these types of accidents.

Avoidable Accident Series



Order your free copies now from atsbinfo@atsb.gov.au
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Aviation groups collaborate to improve safety

The ATSB, CASA, and the Aerial Agricultural Association of Australia have worked together to address a potentially significant hazard to turbine Dromader aircraft.

The issue was identified during the ATSB investigation into a fatal accident west of Dirranbandi in Queensland.

On 19 July 2011, the PZL-Mielec M18A Turbine Dromader aircraft, was conducting spraying at a cotton station.

At 1138, the aircraft took off for its third spraying flight of the day. At about 1400 a ground staff member could not contact the pilot by radio. He raised the alarm.

A search was initiated and the wreckage of the aircraft was located in a ploughed field on the station. The pilot died in the accident and the aircraft was destroyed by impact forces.

ATSB investigators found that the aircraft had departed from controlled flight during a turn at low altitude, and the pilot was unable to recover before impact with the ground. The investigators could not conclusively determine the reasons why this had happened. However, they did identify a significant safety issue surrounding the potential for excessive shifting of the aircraft's centre of gravity as the contents of the aircraft's chemical/spray tanks were dumped or dispensed.

As a result, CASA and the owner/developer of the approval for operations at weights of up to 6,600 kg, which had effect during the flight, took action to improve operator and pilot understanding of the issue. CASA has distributed letters to operators, cautioning them of the potential danger. In addition, the owner/developer indicated that the design would be reviewed to address any excessive centre of gravity variations.

Although the hazard was not found to be a factor in the accident, the ATSB emphasises the importance of pilots maintaining their aircraft's weight and balance within limits throughout a flight. They should also understand the implications of changing weight and balance. ■



Wreckage of the Dromader in the cotton field

30 years of safer aviation

This year marks the 30th anniversary of operationally independent aviation safety investigations in Australia. While a lot has changed in that time, the fundamental model of transport safety investigations has largely remained the same.

On 7 June 1982, the Bureau of Air Safety Investigation (BASI) was created as an operationally independent agency, marking the start of a new era in aviation safety.

Now operating as the ATSB, Australia's national transport safety investigator plays an essential role—along with regulators and operators—in improving the transport safety system in Australia.

BASI was born out of the specialist Air Safety Investigation Branch that was part of the Department of Civil Aviation in the 1950s. The Air Safety Investigation Branch was an operationally independent unit, and helped to evolve aviation safety investigation.

'In BASI, you can really see the foundations of the ATSB,' said Richard Batt, editor of *Past Present Future*, a history of the Australian Transport Safety Bureau and its predecessors. 'So many important steps were made—steps that would inform not just how the ATSB works today, but how aviation investigations are conducted worldwide.' Among these was BASI's early adoption and research into human and organisational factors, which helped to set the benchmark for investigations.

On 1 July 1999, BASI combined with other national transport safety units to form the Australian Transport Safety Bureau.

Thirty years after the creation of BASI, its successor has become a world-leader in aviation, marine and rail safety investigations, continuing the tradition of operational independence, objectivity, and technical expertise.

Past Present, Future is 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.

Non-standard radio procedures

Report narrative:

The reporter expressed safety concerns about non-standard radio communication procedure adopted by local pilots leading to radio congestion at an aerodrome.

The reporter states that local pilots read back their squawk code, flight rules and destination when requesting a taxi clearance. However, this is not required under the Aeronautical Information Publication (AIP) as it has already been read back to ACD on the ACD discrete frequency.

The reporter states that this non-standard procedure has become problematic due to the increased traffic at [aerodrome] and due to the congestion on the SMC frequency at peak periods.

The reporter suggests that Airservices Australia ensures local operators are aware of and follow the standard radio procedures when requesting a taxi clearance.

Response/s received:

Airservices appreciates the opportunity to respond to the reported concerns regarding the radio procedures at [aerodrome].

The following extracts from the Aeronautical Information Publication (AIP) and the Manual of Air Traffic Services describe:

- the information ATC provide in an airways clearance;
- the standard phraseology used by a pilot requesting a taxi clearance;

- a pilot's requirement to read back all ATC clearances; and
- ATCs requirement to obtain a readback.

Airways clearance delivery

As per AIP ENR 1.1, Paragraph 3.21, an airways clearance normally contains the following items:

- aircraft identification;
- destination, area of operation, position or clearance limit;
- route of flight;
- assigned level, except when this element is included in the SID description;
- for IFR flights, departure type;
- SSR code;
- frequency requirements
- SSR codes, data link logon codes;
- level instructions, direction of turn, heading and speed instructions.

Read back requirements

As per AIP GEN 3.4, paragraph 4.4, pilots must transmit a correct read-back of ATC clearances, instructions and information which are transmitted by voice. For other than Item a, only key elements of the following clearances, instructions, or information must be read back ensuring sufficient detail is included to indicate compliance:

- an ATC route clearance in its entirety, and any amendments;
- en route holding instructions;
- any route and holding point specified in a taxi clearance;
- any clearances, conditional clearances or instructions to hold short of, enter, land on, line-up on, wait, take-off from, cross, taxi or backtrack on, any runway;

- any approach clearance;
 - assigned runway, altimeter settings directed to specific aircraft, radio and radio navigation aid frequency instructions;
- Note: An 'expectation' of the runway to be used is not to be read back.*
- SSR codes, data link logon codes;
 - level instructions, direction of turn, heading and speed instructions.

Likewise, the Manual of Air Traffic Services states that Air Traffic Control should obtain a read back containing the above information in sufficient detail that clearly indicates a pilot's understanding of and compliance with ATC clearances, including conditional clearances, instructions and information transmitted by voice.

Taxi procedure

The reporter states that local pilots read back their squawk code, flight rules and destination when requesting a taxi clearance. Airservices notes that this is in accordance with AIP GEN 3.4-48 which states that the following standard phraseology should be used by pilots when requesting taxi clearance for departure at a controlled aerodrome:

'[flight number] [aircraft type], [wake turbulence category if "Super or Heavy"] [POB (number)] [DUAL (or SOLO)] RECEIVED (ATIS identification) [SQUAWK (SSR code)] [aircraft location] (flight rules, if IFR) [TO (aerodrome of destination)] REQUEST TAXI [intentions]'

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

CASA notes the response from Airservices Australia that the read back requirements are in accordance with instructions contained in the Aeronautical Information Publication. ■

How can I report to REPCON?

Online:

www.atsb.gov.au/voluntary.aspx