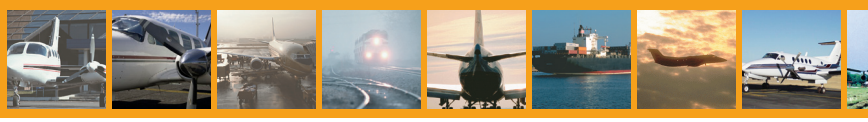
Australian Government
Australian Transport Safety Bureau

The Australian



Chief Commissioner's Message

I would like to introduce myself as the first Chief Commissioner of the Australian Transport Safety Bureau (ATSB). Coincident with my appointment on 1 July 2009, the ATSB became a separate statutory Agency, governed by a Commission, within the Infrastructure, Transport, Regional Development and Local Government portfolio.

For the past ten years, the ATSB has operated successfully as part of the Department of Infrastructure and its predecessors. Now, as a newly separate Agency in Australia's transport safety framework, the ATSB's independent role in transport safety investigation has been enhanced. The establishment of our new Commission marks a major milestone in the ATSB's history but at the same time recognises what remains to be done in transport safety investigation. It is also a privilege that the ATSB and its commissioners value and respect. We understand that the authority and powers of an independent safety investigator are given in the public interest: to ensure that when things go wrong in transport safety, the contributing factors and safety issues are understood and the necessary safety improvements are made.

In responding to its future challenges, the ATSB will maintain its focus on improving transport safety through rigorous investigation, through cogent communication of safety issues and the facilitation of safety actions, and through the dissemination of safety advice and effective education. Without compromising its independence, the ATSB will seek to cooperate with governments, regulators and industry participants to achieve our common objective of improved transport safety. I am proud to lead such a competent and professional organisation and to support the continued work of its staff.

Finally, I wish to take the opportunity to thank the former Executive Director, Mr Kym Bills, who built the ATSB into an internationally respected and world-class organisation that I am proud to lead.

Martin Dolan
Chief Commissioner

Amateur-built and experimental aircraft survey: The results

In the last three decades, both in Australia and overseas, there has been significant growth in the number of amateur-built and experimental (ABE) aircraft. While these aircraft continue to increase in popularity, there has been little formal study of them in Australia and worldwide.

In the September-October 2007 edition of *Flight Safety Australia*, the ATSB invited owners of non-factory ABE aircraft to participate in a survey, which sought to provide some insight into the operational and demographic aspects of this sector of the industry.

In June 2009, Part 1 of this two-part series was released. This report, based on the responses from the survey, explored the issues affecting ABE aircraft owners when selecting, building, purchasing, testing, designing, operating, and maintaining these aircraft.

The report outlined some key features of these owners, including that:

- ABE owners were primarily of retirement age, and private pilots
- on average, 30% of their total flying hours were flown in ABE aircraft
- on average, ABE aircraft accumulated 42 airframe hours in the previous year
- build challenge, personal satisfaction, aircraft performance, price, operational costs, and ability to perform maintenance, were important reasons for purchasing an ABE aircraft
- 33% of builders made major modifications during the build process
- 70% of ABE owners undertook transition training, and this was more likely among private pilots, and those with fewer total hours
- for 85% of respondents, one person performed all maintenance on the aircraft
- automotive engines and avionics were associated with the greatest build challenge.

While many of these facts have been known anecdotally, this report placed greater specificity on different aspects of ABE aircraft building and operation. This will allow aviation regulators and ABE associations to understand better the needs and activities of ABE aircraft designers, builders, operators and maintainers. This, in turn, will help to foster a safe, highly-skilled, and better represented amateur-built aircraft community.

The second part of this series will examine the safety of VH- registered ABE aircraft through the analysis of accident data held by the ATSB. The survey results presented in Part 1 will also be used to inform the analysis of ABE aircraft safety trends and issues in Part 2.

The ATSB would like to thank those who participated in the survey, which provided an interesting picture of ABE aviation in Australia. ■

ATSB Research and Analysis Report AR-2007-043(1)

Aviation Safety Investigator

Engine Failure

On 11 February 2008, at about 0720 CST, following takeoff from Jabiru Airport, NT, a Beech Aircraft Corporation 1900D, registered VH-VAZ, sustained a failure of the left engine and the subsequent auto-feathering of the left propeller. The aircraft was on a charter flight to Darwin with two pilots and a passenger on board.

The passenger reported to the crew that debris, which was described as 'white chunks of metal', was coming out of the exhaust of the left engine. Observers on the ground saw a puff of smoke, followed by flames coming from the left engine. At the time of the engine failure, the aircraft's landing gear was retracted and the engine was in the TAKEOFF POWER configuration. The engine failure occurred shortly after selecting the engine bleed air OPEN, and it was preceded by a loud 'banging' noise, followed by a left yaw of the aircraft. The aircraft's flight recorder data later showed that the engine failure occurred about 20 seconds after takeoff, at about 600 ft above ground level and at an indicated airspeed of 169 kts. The data indicated normal operation of the engine prior to the occurrence.

Following the engine failure, the flight crew correctly identified the problem engine and took timely and appropriate action to return to Jabiru and complete a single-engine landing.

Ground personnel reported that there was visual evidence in the engine exhaust of catastrophic damage to the power, or hot section of the engine. The left engine was removed by the operator and shipped to an approved engine overhaul facility for disassembly and examination under the supervision of the ATSB. Examination of the left engine revealed that the initiator of the damage was the release of a power turbine second-stage blade. Metallurgical examination determined that the failure of the second-stage turbine blade had occurred as a consequence of the initiation and growth of a high-cycle fatigue crack from the downstream trailing corner of the blade fir-tree root post. Damage to the crack origin prevented the identification of any features that may have contributed to the initiation of fatigue damage. At the time of blade fracture, approximately 25 per cent of the root cross-section had been compromised by fatigue cracking.

The engine manufacturer advised that the engine was manufactured with post Service Bulletin (SB) 14172R1 power turbine second-stage blades installed (part number (PN) 3118563-01 blades). During the subsequent overhaul of the engine by an overseas overhaul facility, outdated PN 3118353-01 blades were installed, and compliance with SB 14172R1 was incorrectly annotated in the engine's documentation. Advice from the engine manufacturer indicated that the older blades should not have been installed in the engine, as they were the subject of an earlier, fleet-wide engine upgrade campaign.

The involvement of the overseas overhaul facility contributed to the inability of the investigation to establish why the pre-SB 14172R1 blades were installed during the May 2005 engine overhaul, and the reason for the incorrect annotation in the engine's documentation. However, the older PN 3118353-01 PT blades, if installed, were subject to a recurrent periodic 1,500 hr inspection. A review of the engine's maintenance documentation did not show any evidence that those recurrent inspections had been carried out. Technicians scheduling engine maintenance subsequent to the May 2005 overhaul, may have been misled by the incorrect annotation of the engine's compliance with SB 14172R1. The effect would have been that the technicians would have interpreted that the routine inspection of the blades was not yet required. ■

ATSB Investigation Report AO-2008-008

Investigation briefs

Midair collision

ATSB Investigation AO-2009-005

On 7 February 2009, five aircraft were engaged in circuit training and one aircraft was departing runway 03 left (03L) at Parafield Airport, SA. All of the aircraft in the circuit at the time were operated by a local flight school. The control tower was not open and Common Traffic Advisory Frequency - carriage and use of radio required, CTAF (R), procedures were in place.

At about 0736 Central Daylight-saving Time, a S.O.C.A.T.A.-Groupe Aerospatiale TB-10 (Tobago), registered VH-YTG, with an instructor and student on board, was on final approach. In the circuit behind the Tobago was a Grob - Burkhaart Flugzeugbau G-115 (Grob), registered VH-TGM, with an instructor and student on board, also on final approach. The Grob collided with the Tobago from behind, however both aircraft remained controllable and were landed on runway 03L and 03 right.

The investigation found that the pilots of the Grob experienced sun glare and background visual clutter on the base leg for runway 03L and were unable to sight the preceding Tobago. The pilots of the Grob did not discern some broadcasts from the Tobago pilots, significantly diminishing their situational awareness. The pilots of the Grob continued the approach without positively identifying the preceding aircraft in the circuit.

Soon after the accident, the aircraft operator's flight safety officer produced a comprehensive accident investigation report that captured the key aspects of the accident. Included in the report were a number of recommendations, which were implemented by the operator.

The investigation identified a safety issue regarding definition of the circuit traffic limit in CTAF(R) and a safety issue related to the positive identification of traffic before turning final.

CASA has considered these issues in the context of the GAAP Training and Utility Reviews. ■

Wake turbulence event

ATSB Investigation AO-2007-041

On 29 August 2007, at 0840 CST, a SAAB Aircraft Company 340B-229 (SAAB) aircraft departed from Adelaide Airport's runway 05 on a scheduled passenger service to Mount Gambier with two flight crew, one cabin crew and 29 passengers on board. Approximately 30 seconds earlier, an Airbus A320-232 (Airbus), had also departed from runway 05.

When the SAAB reached a height of 250 to 350 ft above ground level (AGL), and at an indicated airspeed of about 130 kts, the flight crew reported an abrupt, severe buffeting and an uncommanded roll to the left. The angle of bank increased to over 30 degrees and was countered by full right aileron by the copilot, who was the flying pilot. That action initially produced no corrective aerodynamic response. After a short pause, however, the left roll stopped and was followed by an abrupt roll to the right. The copilot applied left aileron and levelled the aircraft. As the aircraft climbed through 800 to 900 ft AGL, further moderate buffeting was experienced. The flight continued to Mount Gambier as planned.

As a result of this occurrence, the aircraft operator advised that they reviewed their operating procedures relating to departures behind jet aircraft and will use the ATSB report as part of a safety promotion strategy directed at all company pilots. Company pilots are delaying their departures when behind 'larger' medium-category aircraft where the effect of wake turbulence is considered to be a hazard. In addition, CASA is reviewing the safety implications of this incident in particular, noting the action taken by the United Kingdom Civil Aviation Authority to expand the number and specification of wake turbulence categories. CASA is also considering the development of a safety education program for flight crew and air traffic controllers in regard to wake turbulence. ■

Approch to land on closed section of runway

ATSB Investigation AO-2008-033

On 9 May 2008, a Boeing Company 737-8CX aircraft, registered PK-GEF, was being operated on a scheduled passenger service between Denpasar, Republic of Indonesia and Perth, WA. On board were two flight crew, six cabin crew and 76 passengers.

The flight crew reported that, once established in the cruise, they reviewed their briefing material and noted that the threshold for runway 21 at Perth was displaced due to runway works.

At 1557, the approach controller at Perth cleared the flight crew to conduct the runway 21 localiser approach. At 1600, the aerodrome controller issued the flight crew with the landing clearance, '... runway 21 displaced threshold, cleared to land'. When the aircraft was about 15 seconds from touchdown, the flight crew questioned the presence of cars on the runway and conducted a go-around.

On the second approach, the flight crew were again issued the landing clearance '... runway 21, displaced threshold, cleared to land'. The aerodrome controller recalled observing the aircraft on what appeared to be an approach to land on the closed section of the runway and instructed the flight crew to go around. The go-around instruction also included information to assist the flight crew in identifying where the aircraft was to be landed. That additional information, together with the high workload being experienced by the flight crew at that time, may have momentarily confused them, with the result that they did not assimilate and act on the instruction to go around.

As a result of this incident, the airport operator undertook a number of safety actions. Those actions included the review of its dispatch of Method Of Working Plan (MOWP) to relevant stakeholders; the implementation of a more robust MOWP receipt and acknowledge system; and the establishment of a project safety group in support of all critical airside works. ■

Controlled flight into terrain

ATSB Investigation AO-2007-066

On 7 December 2007, the pilot of an Air Tractor Inc. AT-802 aircraft, registered VH-LIS, was conducting a test flight at Lake Liddell, NSW. The purpose of the flight was to test an experimental in-flight water collection system using skis attached to the aircraft's main landing gear. At about 0910 AEST, the pilot was conducting the second test run of the day. After the skis had been in contact with the surface of the lake for 36 seconds, witnesses observed the aircraft pitching nose down, about its right main landing gear while rotating to the right. The aircraft then overturned and sank. The aircraft was substantially damaged and the pilot was fatally injured.

The investigation concluded that the right experimental ski breached the surface of the water which caused a substantial amount of drag to act on the right side of the aircraft, rendering the aircraft uncontrollable. The circumstances of this accident highlight the need for due diligence and detailed risk assessments to be performed as part of experimental test programs. As a result of this incident, CASA has proposed amendments to Advisory Circular 21-10 - Experimental Certificates to provide updated guidance information to persons applying for the issue of experimental certificates, and advice on risk management for test pilots during experimental flight testing.

In addition, the ATSB issued a safety recommendation to CASA in respect of the need to consider the safety of third parties, including on the ground or water, before issuing a Special Certificate of Airworthiness. ■

Fuel starvation

ATSB Investigation AO-2007-017

On 26 June 2007 at 0639 WST, an Empresa Brasileira de Aeronáutica S.A. EMB-120ER aircraft, registered VH-XUE, departed Perth, WA on a contracted passenger charter flight to Jundee Airstrip. There were two pilots, one flight attendant, and 28 passengers on the aircraft. While passing through 400 ft above ground level on final approach, with flaps 45 set, the aircraft drifted left of the runway centreline. When a go-around was initiated, the aircraft aggressively rolled and yawed left, causing the crew control difficulties. The crew did not immediately complete the go-around procedures. Normal aircraft control was regained when the landing gear was retracted about 3 minutes later. The left engine had sustained a total power loss following fuel starvation, because the left fuel tank was empty. The investigation identified safety factors associated with; the fuel quantity indicating system, the ability of the crew to recognise the left engine power loss, and their performance during the go-around. There were clear indications that the operator's fuel quantity measurement procedures and practices were not sufficiently robust to ensure that a quantity indication error was detected. The failure of that risk control provided the opportunity for other safety barriers involving both the recognition of, and the crew's response to, the power loss, to be tested. Organisational safety factors involving regulatory guidance, the operator's procedures, and flight crew practices were identified in those two areas. The operator introduced revised procedures for measuring fuel quantity and CASA initiated a project to amend the guidance to provide better clarity and emphasis. The crew's endorsement and other training did not include simulator training and did not adequately prepare them for the event. There was no EMB-120 flight simulator facility in Australia and no Australian regulatory requirement for simulator training. In March 2009, an EMB-120 flight simulator came into operation in Melbourne. ■

Midair collision

ATSB Investigation AO-2008-010

On 13 February 2008, a Piper Aircraft Corporation PA-18 Super Cub aircraft and a Robinson Helicopter Company R44 Raven helicopter, were engaged in feral goat culling operations in the Kennedy Range National Park, WA.

The two aircraft collided in mid-air as the pilot of the helicopter executed a climbing left turn that brought the two aircraft into close proximity. The pilot and shooter occupants of the R44 were aware that the Super Cub was approaching them at the same height, and the helicopter pilot was aware of the position of the aeroplane during the helicopter's climbing turn, but it appeared probable that the pilot and spotter occupants of the Super Cub did not see the helicopter.

The helicopter's main rotor blades struck the Super Cub's right wing, severing the lift struts. The right wing detached in flight, and the Super Cub fell to the ground. The pilot and spotter were fatally injured. The helicopter was able to land safely.

The investigation determined that the occupants of the Super Cub were probably unaware of the proximity of the R44, and that the R44 pilot did not recognise the collision hazard until there was insufficient time to prevent contact with the Super Cub.

The investigation also identified that there were no formalised operating procedures detailing the conduct of culling operations involving multiple aircraft that may have assisted in the maintenance of aircraft separation.

In response to this accident, a number of safety actions were undertaken by the R44 and Super Cub operators. In addition, extensive safety action was carried out by the WA Government departments that were involved in the operation. That included in the areas of risk management, the review and amendment of guidelines and procedures affecting multiple aircraft operations, the adoption of Safety Management Systems, and the provision of training for departmental personnel. ■

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.

Cabin crew rostering

R200800099

Report narrative:

The reporter expressed safety concerns, particularly fatigue levels and lack of rest facilities for cabin crew, due to the long duty times being rostered by the operator, which could contribute to errors being made in an emergency situation.

On one particular flight, it was reported that due to delays, the anticipated cabin crew duty time was at least 17 1/2 hours. Due to the anticipated delay, the cabin crew requested a hotel room to facilitate resting, but the request was denied and the crew waited over 4 hours in the terminal, with some crew having to sit on the floor.

The reporter also expressed concerns that reports have been submitted via the operator's safety reporting system detailing fatigue of cabin crew who have fallen asleep during critical phases of the flight, but the reporter believes that nothing has changed.

Cabin crews can be rostered to operate up to 20 hours of duty and are often provided inadequate resting facilities, such as two economy seats that are used to provide rest for the nine cabin crew. Each crew member often does not get more than 2 hours rest in a 20 hour period.

REPCON comment:

REPCON supplied the operator with the de-identified report. The operator advised that there were a number of assertions in the report that they believed to be factually incorrect, including that crew rest facilities vary and depend on the aircraft type, sector length and time of day. This REPCON relates to an aircraft type that is configured with a curtained off area of four seats available at the rear of the cabin for crew rest.

The operator advised that a number of cabin crew have submitted reports relating to fatigue. The process for management of fatigue related reports continues to operate. Each reporter's hours worked are reviewed using a fatigue model. Results of the analysis and a copy of the original report are forwarded to the applicable manager for their review and follow up action.

Management reports are tabled at relevant safety meetings. The actions that have resulted from this management review activity resulted in a change to the routes flown to address the fatigue related reports. This action was communicated to all staff via the company intranet.

A Fatigue Risk Management System program is being implemented across the entire company. As a part of this program, all cabin crew have been provided with fatigue awareness training, reinforcing the need to manage their lifestyle choices prior to duty. It also includes the need for cabin crew to declare themselves unfit for duty, should they be too fatigued to perform their operational duties.

There are adequate processes in place to identify and implement improvements to our rostering practices as a result of reported fatigue.

REPCON supplied CASA with the de-identified report and a version of the operator's response. CASA advised that it has reviewed the REPCON report in conjunction with the operator and is satisfied with the operator's management of the issue.

Decommissioning of a NDB (Non-Directional radio Beacon)

R200800104

Report narrative:

The reporter expressed safety concerns about the imminent decommissioning of the Adelaide Airport NDB (Non-Directional radio Beacon) and that new NDB approaches at Parafield Airport have been NOTAMED as unavailable for training operations. The reporter was also concerned that there was an increased risk of mid-air collision due to so many training aircraft having to use the already overcrowded airspace associated with the Tailem Bend NDB.

REPCON comment:

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

> CASA was aware of the decommissioning of the Adelaide NDB and that the Parafield NDB was relocated and commissioned for instrument approaches into that aerodrome. These events had been discussed at the Adelaide Regional Airspace Users Advisory

Committee meetings some time before the aids were decommissioned and relocated.

CASA has been informed that Adelaide Airports Limited requested Airservices Australia (Airservices) to decommission the Adelaide Airport NDB. While the Adelaide NDB did not form part of the backup network of navigation aids, at the time it was in operation and [sic] it did provide an instrument approach into Parafield. Accordingly, there was a need to provide a replacement instrument approach into Parafield and once the Adelaide NDB was decommissioned, the re-located Parafield NDB, together with its associated instrument approach procedure, was commissioned. The safety assessments involved are matters for Airservices.

The reporter was concerned about the safety implications of this situation for the large number of training aircraft operating in the affected area. CASA understands that Airservices had provided an undertaking that the Adelaide NDB would not be decommissioned until Parafield NDB approaches were available. Although the Parafield NDB approaches became available, due to environmental considerations identified by Airservices, the Parafield NDB is now subject to a permanent NOTAM (C0043/09) with effect from 11 March 2009 that states: "VOR AND NDB PROC NOT AVBL FOR TRAINING OPS. OTHER OPS IN IMC PERMITTED".

In December 2007 there were changes to CASA requirements for NDB training following the amendment of the Civil Aviation Orders dealing with instrument ratings (CAO 40.2.1) to remove the mandatory requirement that a [sic] NDB approach must be undertaken on a Command Instrument Rating issue or renewal. NDB training is now optional for the command instrument and night VFR ratings...

However the management of these airspace issues remains the responsibility of Airservices.

Runway standards for the operation of the A380

R2008000116

Report narrative:

The reporter notes the growing awareness of runway excursions as a significant safety risk factor, and has expressed safety concerns about runway standards required by the regulator, such as runway width and lights for the operation of the Airbus A380 aircraft in Australia that do not meet the International Civil Aviation Organization (ICAO) minimum standards. Runway pavement width as requirements determined by ICAO for a code F aircraft (A380) is required to be a minimum of 60 metres. CASA has allowed this to be reduced to 45 metres as documented in the CASA Notice of Final Rule Making. To mitigate the risks of a crosswind landing, CASA has reduced the crosswind component to 15 knots; half the certified crosswind component for the A380.

Reporter comment: Is this a realistic expectation that the A380 will divert or not take off when the crosswind component is greater than 15 knots?

The reporter is also concerned that the runway shoulder constructions should be signed off by CASA to eliminate the chance of lesser standards being applied and CASA should be more detailed in specifying the standards expected e.g. bituminous concrete surfacing rather than bitumen sealing.

Reporter comment: According to the final rule making the A380 will require a 7.5 metre shoulder on each side for occasional aircraft run off, and an additional 7.5 metre of blast protection on each side. How is this to be interpreted in engineering terms? For example, what is the percentage of capacity design thickness under Equivalent Single Wheel Load (ESWL)?

The reporter believes that the concession for the runway edge lights seems to allow them to remain in their existing positions (for a 45 metre wide runway) and therefore not meet the ICAO standards that require the lighting to be no more than 3 metres from the edge of a 60 metre wide runway. The reporter believes that the runway edge lights are significant obstacles for the A380 especially as the runways are not being upgraded to the ICAO minimum standards and the existing positions of the runway edge lights are almost in line with the outboard engines of the A380.

Reporter comment: The flush fitting options that are being suggested to eliminate the potential risks of the elevated lights have their own set of safety issues and should not be introduced as an option.

The reporter is also concerned that judging by a lack of progress to date, the 'upgrades' to the airports where the A380 operates may never occur and consequently Code F aircraft will be operating at airports that were never designed for that size aircraft.

Reporter comment: CASA should set a firm timetable for all airports where the A380 operates to complete the 'upgrades'.

REPCON comment:

REPCON supplied CASA with the de-identified report. In response, CASA advised that it had already undertaken a detailed review of airport compatibility for the A380, published in January 2008 when amendments were made to the 'Manual of Standards Part 139 - Aerodromes', which permitted A380 (a Code F aeroplane) operations at existing Code E runways. This document is available on the CASA website. CASA advised that the review considered all the concerns raised in the REPCON report.

REPCON reports received	
Total 2007	117
Total 2008	121
First Quarter 2009	41
Second Quarter 2009	28
What happens to my report?	
For Your Information issued	
Total 2007	58
Total 2008	99
First Quarter 2009	42
Second Quarter 2009	20
Alert Bulletins issued	
Total 2007	1
Total 2008	12
First Quarter 2009	0
Second Quarter 2009	0
Who is reporting to REPCON?#	
Aircraft maintenance personnel	27%
Air Traffic controller	4%
Cabin crew	3%
Facilities maintenance personnel /ground crew	1%
Flight crew	34%
Passengers	6%
Others*	25%

29 Jan 2007 to 31 July 2009
* examples include residents, property owners, general public

How can I report to REPCON?
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