Australian Government
Australian Transport Safety Bureau

Aviation Short Investigation Bulletin

Issue 24

Investigation

ATSB Transport Safety Report
Aviation Short Investigations
AB-2013-202
Final – 10 December 2013

Released in accordance with section 25 of the *Transport Safety Investigation Act 2003*

Publishing information

Published by: Australian Transport Safety Bureau
Postal address: PO Box 967, Civic Square ACT 2608
Office: 62 Northbourne Avenue Canberra, Australian Capital Territory 2601
Telephone: 1800 020 616, from overseas +61 2 6257 4150 (24 hours)
Accident and incident notification: 1800 011 034 (24 hours)
Facsimile: 02 6247 3117, from overseas +61 2 6247 3117
Email: atsbinfo@atsb.gov.au
Internet: www.atsb.gov.au

© Commonwealth of Australia 2013

Ownership of intellectual property rights in this publication
Unless otherwise noted, copyright (and any other intellectual property rights, if any) in this publication is owned by the Commonwealth of Australia.

Creative Commons licence
With the exception of the Coat of Arms, ATSB logo, and photos and graphics in which a third party holds copyright, this publication is licensed under a Creative Commons Attribution 3.0 Australia licence.

Creative Commons Attribution 3.0 Australia Licence is a standard form license agreement that allows you to copy, distribute, transmit and adapt this publication provided that you attribute the work.

The ATSB's preference is that you attribute this publication (and any material sourced from it) using the following wording: *Source:* Australian Transport Safety Bureau

Copyright in material obtained from other agencies, private individuals or organisations, belongs to those agencies, individuals or organisations. Where you want to use their material you will need to contact them directly.

Contents

Jet aircraft

Runway event involving a Fokker F28, VH-JFB 5
Ground proximity event between a Boeing 737, VH-VZA and a security vehicle 10

Turboprop aircraft

Wheels up landing involving a Cessna 441, VH-SMO 15
Airspace related event involving a Saab 340B, VH-ZLJ and parachutists 17
Wirestrike involving an Air Tractor AT 502, VH-CJY 20

Piston aircraft

Landing on a closed runway involving a Cessna 404, VH-HVR 25
Fuel starvation event involving a Beech BE58, VH-ECL 29
Loss of control involving a Piper PA 28R-200, VH-MMU 33
Engine fire involving a Beech A36, VH-FFY 37
Runway incursion involving a De Havilland DH 82, VH-BJE and a Piper PA 34, VH-SEN 41
Runway incursion between a Cessna 206, VH -LHX and a Cessna 210, VH-HGZ 44
Total power loss involving a Piper PA 28 140, VH-RVJ 47

Helicopters

Partial power loss involving a Bell 47G, VH-RTO 51
Aircraft proximity event between a Cessna 172, VH-RQZ and an Agusta AW139, VH-ESZ 54
Aircraft configuration event involving a Robinson R22, VH-ONT 58

Jet aircraft

Runway event involving a Fokker F28, VH-JFB

What happened

On 26 August 2013, at about 1958 Eastern Standard Time,[1] an Alliance Airlines Fokker F28 aircraft, registered VH-JFB, was taxiing at Williamtown Airport on a charter flight to Sydney, New South Wales, under instrument flight rules (IFR).

Last light[2] had been at 1755 and the crew reported that the night was very dark. The captain, who was designated as the pilot flying, had not previously operated from Williamtown at night and was used to operating from runways with centreline lighting. The crew were aware of a Notice to Airmen (NOTAM)[3] that had been issued for Williamtown, stating that the centreline markings on runway 12/30 were faded.

During the taxi, the taxi light positioned under the nose of the aircraft became unserviceable and the crew relied on the landing lights for illumination. One landing light was positioned at the end of each wing and was angled to provide illumination for landing, resulting in no illumination of the area directly in front of the aircraft.

As the captain taxied the aircraft onto the runway 12 threshold, air traffic control (ATC) issued departure instructions and a take-off clearance. The captain then momentarily looked down to confirm that the correct departure heading had been entered into the aircraft's flight management system. As he looked up, he believed he had almost overshot the runway centreline as he observed the threshold markings in front and under the nose of the aircraft, and a line of recessed lights to his left.[4] The captain determined that the recessed lights were runway centreline lights.

The aircraft was lined up on runway 12. At that time, the captain believed that the aircraft was lined up on the centreline as it was centrally located between two lines of runway edge lights and in the middle of an expanse of concrete.

At 2003, the captain commenced the take-off run. Immediately after, the captain noted that the ground area to the left of the runway centreline lights ahead was a different colour than that on the right. He then realised that he had lined up on the runway edge lights. The captain rejected the take-off and steered the aircraft to the right, toward the actual runway centreline.

A runway inspection was completed, which determined that the aircraft did not depart the paved area. The crew re-taxied and departed for Sydney with no further incident.

---

1 Eastern Standard Time (EST) was Coordinated Universal Time (UTC) + 10 hours.

2 Last light is the time when the centre of the sun is at an angle of 6° below the horizon following sunset. At this time large objects are not definable but may be seen and the brightest stars are visible under clear atmospheric conditions. Last light can also be referred to as the end of evening civil twilight.

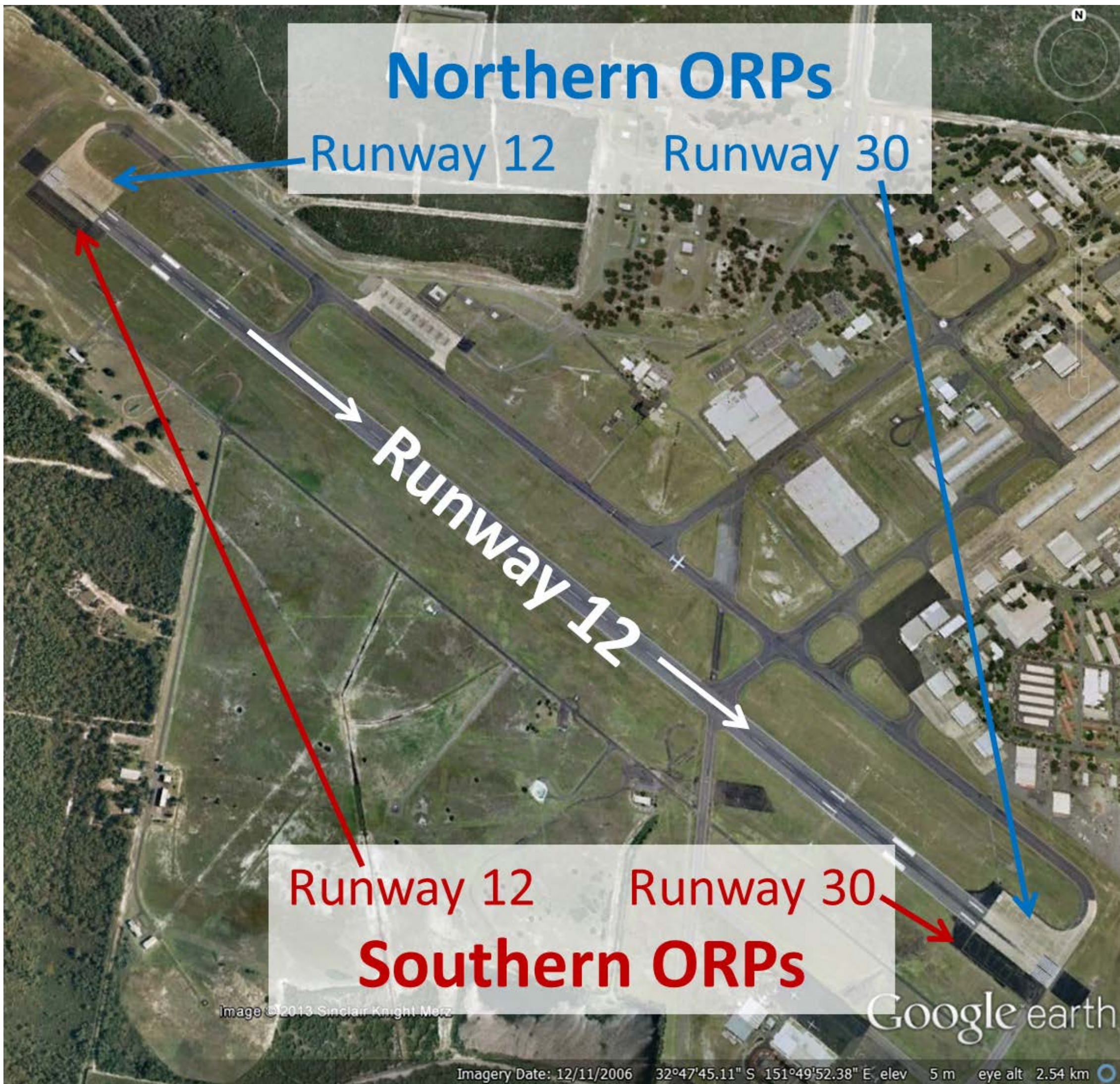
3 A Notice to Airmen (NOTAM) advises personnel concerned with flight operations of information concerning the establishment, condition or change in any aeronautical facility, service, procedure, or hazard, the timely knowledge of which is essential to safe flight.

4 The captain reported that, at the time of the incident, the left window was slightly opaque, hampering clear vision.

Williamtown Airport

Williamtown Airport was owned and operated by the Department of Defence, and had one runway aligned 12/30. The runway had an operational readiness platform (ORP) at each end of runway 12/30, on both sides (Figure 1). The ORP was a wide section of tarmac adjacent to the runway threshold, used by military aircraft. The ORPs on the northern side of the runway and both thresholds were concrete; an uneven grey colour. The ORPs on the southern side and the majority of the runway were tarmac, black in colour.

Figure 1: Williamtown Airport showing location and colour of ORPs and runway 12



Source: Google earth

The runway had white runway edge lighting, but was not fitted with runway centreline lighting. For the portion of the runway adjacent to the ORPs, the runway edge lighting was recessed.

The Departure and Approach (DAP) aerodrome chart showed the ORPs on either side of both thresholds, however, the chart did not indicate colour as the DAP only detailed whether a runway was ‘sealed’ or ‘unsealed’. The En Route Supplement Australia (ERSA) further noted that the runway 12/30 surface was both asphalt/bitumen and concrete, while the Jeppesen,[5] which the crew were referencing for the flight, indicated the surface type was asphalt.

[5] Jeppesen is an American company that produces aeronautical navigational information and other services.

The photographs below depict the positions of the runway edge lighting and the runway centreline markings in daylight and at night (Figures 2 to 5).

Figure 2: Runway edge in daylight

Source: Department of Defence

Figure 3: Runway edge at night

Source: Department of Defence

Figure 4: Runway centreline in daylight

Source: Department of Defence

Figure 5: Runway centreline at night

Source: Department of Defence

Alliance Airlines investigation

An internal investigation conducted by Alliance Airlines found that the design of the ORP recessed lighting and obscured centreline markings caused visual confusion during the line-up procedure. This was further compounded by an unserviceable aircraft taxi light and the distraction caused by the requirement for the crew to enter the heading issued by ATC as part of the departure instructions at a critical time.

The operator also found that, under the substitution test,[6] it was reasonable to expect that a similar event could occur again.

[6] Substitution test – could some well-motivated, equally competent and comparably qualified individual make the same kind of error under the same or very similar circumstances?

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

Alliance Airlines

As a result of this occurrence, Alliance Airlines has advised the ATSB that they have released an operational notice to crews to increase pilot awareness of ORPs at military airports, including a note that, due to the large expanse of tarmac area at the threshold, a greater risk of misaligned take-offs exist. Additionally, as part of the operator's accident prevention program, a *Take-off Misalignment Hazards* publication has been issued.

Department of Defence

The Department of Defence advised the ATSB that, at the time of the incident, remediation works were planned to address the faded centreline markings. These works consisted of repainting the runway centreline markings and refreshing the taxiway lead-in lines with black contrast lines to highlight the markings. At the time of publication, the remediation works had been completed.

Safety message

In 2010, the ATSB published a research report on the factors influencing misaligned take-offs at night.[7] The report identified the following eight factors common to misaligned take–offs, both in Australia and internationally:

1. *distraction or divided attention of the flight crew*
2. *confusing runway layout*
3. *displaced threshold or intersection departure*
4. *poor visibility or weather*
5. *ATC clearance/s issued during runway entry*
6. *no runway centreline lighting*
7. *flight crew fatigue*
8. *rec*essed runway edge lighting.

To promote awareness, knowledge and action, the ATSB also developed a pilot information card (above) to assist crews in identifying factors that increase the risk of a misaligned take-off.

The ATSB research report *AR-2009-033 – Factors influencing misaligned take-off occurrences at night* is available at www.atsb.gov.au/publications/2009/ar2009033.aspx

The following ATSB investigation reports provide further reading on misaligned take-offs:

- *AO-2007-045 – Ground strike Sydney Kingsford Smith Airport, NSW 13 October 2007 VH-EEB Embraer EMB-120 ER* is available at www.atsb.gov.au/publications/investigation_reports/2007/aair/ao-2007-045.aspx
- *AO-2009-007 – Collision on ground Townsville Aerodrome, Queensland 11 February 2009 VH-SBW Bombardier DHC-8-315* is available at www.atsb.gov.au/publications/investigation_reports/2009/aair/ao-2009-007.aspx
- *AO-2012-041 – Runway excursion, aircraft unknown at Williamtown New South Wales between 19 and 21 March 2012* is available at www.atsb.gov.au/publications/investigation_reports/2012/aair/ao-2012-041.aspx

---

[7] www.atsb.gov.au/publications/2009/ar2009033.aspx

General details

Occurrence details

Date and time:	26 August 2013 – 2003 EST	
Occurrence category:	Serious incident	
Primary occurrence type:	Runway event	
Location:	Williamtown Airport, New South Wales	
	Latitude: 32° 47.70' S	Longitude: 151° 50.07' E

Aircraft details

Manufacturer and model:	Fokker B.V. F28 MK 0070	
Registration:	VH-JFB	
Operator:	Alliance Australia	
Serial number:	11521	
Type of operation:	Charter – passenger	
Persons on board:	Crew – 4	Passengers – 4
Injuries:	Crew – Nil	Passengers – Nil
Damage:	None	

Ground proximity event between a Boeing 737, VH-VZA and a security vehicle

What happened

On 26 August 2013, a Qantas Airways Boeing 737 aircraft, registered VH-VZA (VZA) (Figure 4), was completing a scheduled passenger flight from Cairns, Queensland to Sydney, New South Wales.

After landing, at about 2010 Eastern Standard Time,[1] VZA was cleared by air traffic control (ATC) to taxi to Bay 6 of the Domestic 1 (DOM 1) apron[2] area at Sydney Airport, via taxiway 'Bravo' (B) then 'Bravo 2' (B2) (Figure 3).

At about 2020, as the aircraft was taxiing along B2 toward the parking area, VZA was instructed by ATC to pass behind another aircraft vacating DOM 1. To reduce the light shining into the vacating crew's cockpit, the first officer switched off the right runway turn-off light[3]. The captain, who was focused on taxiing the aircraft, was not aware that the turn-off light had been switched off.

At about the same time, the captain observed the lights of a white security vehicle[4] (Figure 1) approaching from about 50 m away and about 90° to the right of the aircraft. He estimated the speed of the vehicle was about 30km/h, about the same as VZA's taxi speed.

Figure 1: Security vehicle

Source: Security operator

Figure 2: Vehicle GIVEWAY sign on airside road

Source: Sydney Airport Drivers Pocketbook

The captain thought the vehicle would continue along the airside road[5] and turn right behind the aircraft parked in the bays, remaining clear of VZA. However, as the car continued in a northerly direction across the intersection of the airside road and taxiway, at a similar speed, the captain believed it was on a collision course with VZA. Realising the vehicle driver had not seen VZA, the captain immediately stopped the aircraft and went to flash the right turn-off light at the driver, but found it in the off position, so turned it back on. The security vehicle continued toward the aircraft

---

1 Eastern Standard Time (EST) was Coordinated Universal Time (UTC) + 10 hours.

2 The apron area is that part of the airport used for boarding or disembarking passengers, loading and unloading cargo, aircraft refuelling and maintenance.

3 Runway turnoff lights are located on the leading edge of the wing root.

4 Sydney Airport Corporation Limited advised that the security company vehicles do not go onto the manoeuvring area, so are not fitted with VeeLo. VeeLo is a vehicle locator that can be tracked and identified on ATC tower displays

5 The airside road remains clear of the aircraft manoeuvring area, except where the road, marked as a road, crosses a taxiway.

then came to an abrupt stop about 10 m to the right of the aircraft's nose. The car then reversed clear of the aircraft and passed behind VZA, and continued on its journey to Terminal 1.

Captain comments (VH-VZA)

The captain reported that the aircraft was taxiing with the taxi light,[6] navigation lights,[7] anti-collision lights[8] and, initially, both runway turn-off lights on. He advised that it was common practice to turn off the relevant runway turn-off light when passing an opposite direction aircraft, to avoid adversely affecting the night vision of the crew in that aircraft.

He further stated that the DOM 1 entry and exit area, where the airside road crosses, was busy, but well lit. He was surprised that the driver of the security vehicle did not see the aircraft.

Figure 3: Sydney Airport Domestic 1

Source: Google earth

Security vehicle driver comments

The security vehicle driver had been tasked by the ramp supervisor to take some documents from Terminal 2 to Terminal 1 on the other side of the airport. He was accompanied by a colleague. As per the procedures[9] for vehicle movements on the apron, the driver was using the appropriately marked airside road and was travelling within the maximum allowable speed of 30 km/h.[10] The vehicle headlights were on low beam and the rotating beacon on top of the vehicle was on.

As the vehicle approached the intersection of the airside road and taxiway B2 (Figure 3), he reported slowing to between 25 to 30 km/h. He looked to his left, but did not see the lights of VZA. Assuming the area was clear; he directed his attention to the parking bay area to the right. He was aware that, at night, visibility of aircraft approaching from the parking bays could be obstructed.

---

6 Taxi light is located on the nose wheel of the aircraft.

7 Aircraft navigation lights illuminate the red and green wingtip navigation lights and the white trailing edge wingtip lights.

8 Red high intensity strobe lights located on the upper and lower fuselage.

9 Sydney Airport – Airside Vehicle Control Handbook: Version 3.0.3 (2006).

10 Sydney Airport – Airside Vehicle Control Handbook: Section 4.5- Speed Limits.

The driver also reported that, once a vehicle on the airside road passes the give way point (Figure 2 and 3), the vehicle is angled to the right. This restricts sighting aircraft taxiing from the left, especially at night.

Figure 4: VH-VZA

Source: Brett Pulton

Safety action

Security operator

As a result of this occurrence, the operator of the security organisation has advised the ATSB that they will be conducting a review of their vehicle patrol requirements, focusing on staff safety knowledge, competency, driving skills and physical fitness. At the time of publication, the company had already conducted preliminary meetings to further define the scope of the review.

Safety message

Although this particular incident did not occur on the ground area controlled by Airservices Australia at Sydney Airport, the information regarding situation awareness in their latest version of the publication of *An Airside Driver's Guide to Runway Safety* remains relevant. This publication highlights the need to carefully scan areas potentially occupied by aircraft, prior to crossing.

www.airservicesuastralia.com/wp-content/uploads/airside_drivers_guide.pdf.

The ATSB published a research paper on ground operation occurrences at Australian Airports over a 10 year period. This publication highlighted ground operations as potentially being one of the most dangerous areas of aircraft operation. Of the 282 ground occurrences reported to the ATSB between 1 January 1998 and 31 December 2008, 11 per cent of occurrences happened when the aircraft was approaching the gate. About 37 per cent of the approaching the gate phase occurrences were attributed to near collisions with vehicles. These occurrences required immediate braking action by the flight crew or vehicle driver in order to avoid a collision. The research report is available at http://www.atsb.gov.au/publications/2009/ar2009042.aspx.

General details

Occurrence details

Date and time:	26 August 2013 – 2220 EST	
Occurrence category:	Serious incident	
Primary occurrence type:	Ground proximity event	
Location:	Sydney Airport, New South Wales	
	Latitude: 33° 56.77' S	Longitude: 151° 10.63' E

Aircraft details

Manufacturer and model:	Boeing Aircraft Company 737-838	
Registration:	VH-VZA	
Operator:	Qantas Airways	
Serial number:	34195	
Type of operation:	Air transport – high capacity	
Persons on board:	Crew – Unknown	Passengers – Unknown
Injuries:	Crew – Nil	Passengers –Nil
Damage:	Nil	

Security vehicle

Manufacturer and model:	Toyota 3 door Yaris	
Type of operation:	Airport security	
Persons on board:	Crew – 1	Passengers – 1
Injuries:	Crew –Nil	Passengers – Nil

Turboprop aircraft

Wheels up landing involving a Cessna 441, VH-SMO

What happened

On 3 September 2013, at about 1531 Central Standard Time,[1] a Cessna 441 aircraft, registered VH-SMO (SMO), departed Adelaide on a charter flight to the Honeymoon aeroplane landing area (ALA), South Australia. It was the third return flight to Honeymoon for the pilot that day.

While en route, the pilot determined that the wind conditions were favourable for a straight-in approach to runway 01 at Honeymoon.

During the descent, the pilot selected the first stage of flap. The pilot reported that normally he would also lower the landing gear and confirm that it had been extended, but on this occasion he could not recall performing this action.

Prior to arriving at the airstrip, the pilot contacted ground staff at the ALA. The pilot reported that the ground staff then conducted a runway inspection and subsequently advised that the runway was clear. [2]

The pilot then selected the second stage of flap and established the aircraft on a 5 NM final to runway 01.

When about 500 ft above ground level (AGL), the pilot commenced his pre-landing checklist. After selecting full flap, the first item on the checklist, the pilot looked at the windsock to confirm the wind and observed 4-5 emus on the right side of the airstrip. He watched them run away from the airstrip and then continued the approach, but inadvertently omitted to complete the remaining checklist items, which included confirming the landing gear had been extended. The aircraft subsequently landed with the landing gear retracted.

The pilot reported that, as some engine power had been applied during the landing, the landing gear warning horn did not sound.[3]

Figure 1: VH-SMO after landing

Source: Operator

---

[1] Central Standard Time (CST) was Coordinated Universal Time (UTC) + 9.5 hours.

[2] The pilot reported that emus were regularly sighted at the ALA and that the ground staff would normally notify him if animals were sighted during the runway inspection.

[3] If the landing gear is not down and locked, and the throttle is reduced to the idle position, as in a landing approach, a landing gear unsafe warning horn will sound.

Safety message

This incident highlights the impact distractions can have on aircraft operations, particularly during a critical phase of flight. Research conducted by the ATSB found that distractions were a normal part of everyday flying and that pilots generally responded to distractions quickly and efficiently. It also revealed that 13 per cent of accidents and incidents associated with pilot distraction between January 1997 and September 2004 occurred during the approach phase of flight. The study also identified four occurrences associated with checklists and suggested that, if a checklist is interrupted, pilots should consider returning to the beginning of the checklist to reduce the potential for error.

The Flight Safety Foundation suggests that, after a distraction source has been recognised and identified, the next priority is to re-establish situation awareness by conducting the following:

- *Identify*: What was I doing?
- *Ask*: Where was I distracted?
- *Decide/act*: What decision or action shall I take to get back on track?

The following provide additional information on pilot distraction:

- Dangerous Distraction: An examination of accidents and incidents involving pilot distraction in Australia between 1997 and 2004: http://www.atsb.gov.au/publications/2005/distraction_report.aspx
- Flight Safety Foundation Approach-and-landing Briefing Note 2.4 – Interruptions/Distractions: http://flightsafety.org/files/alar_bn2-4-distractions.pdf
- The United States Federal Aviation Administration (FAA) On Landings Part III pamphlet: http://www.faasafety.gov/files/gslac/library/documents/2011/Aug/56411/FAA%20P-8740-50%20OnLandingsPart%20III%20%5Bhi-res%5D%20branded.pdf

General details

Occurrence details

Date and time:	3 September 2013 – 1627 CST	
Occurrence category:	Accident	
Primary occurrence type:	Wheels up landing	
Location:	Honeymoon (ALA), South Australia	
	Latitude: 31° 38.77' S	Longitude: 140° 43.08' E

Aircraft details

Manufacturer and model:	Cessna Aircraft Company 441	
Registration:	VH-SMO	
Serial number:	4410132	
Type of operation:	Charter	
Persons on board:	Crew – 1	Passengers – 8
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Substantial	

Airspace related event involving a Saab 340B, VH-ZLJ and parachutists

What happened

On 12 September 2013, at about 0956 Eastern Standard Time,[1] a Cessna 185 aircraft, registered VH-OZA (OZA), departed Moruya, New South Wales for a parachute drop overhead the airport at flight level (FL)[2] 150.

At about 1013, the crew of a Regional Express Saab 340B aircraft, registered VH-ZLJ (ZLJ), broadcast on the common traffic advisory frequency (CTAF) advising that they were taxiing for runway 36 at Moruya, for a scheduled passenger service to Merimbula. In response, the pilot of OZA broadcast his intention to conduct a parachute drop overhead the airport from FL 150 and that he would delay the drop until ZLJ had departed. The crew of ZLJ acknowledged the broadcast.

About 3 minutes later, while maintaining FL 150, the pilot of OZA contacted the crew of ZLJ and queried whether they were waiting for him to conduct the parachute drop before they departed. The crew stated they had a technical issue and would commence the take-off in about 1 minute.

At about 1018, the crew of ZLJ broadcast that they had entered, and were rolling on runway 36, and intended to conduct a right turn after take-off, with a departure track of 178° (True), on climb to 9,000 ft above mean sea level (AMSL).[3]

At about 1020, the pilot of OZA asked the crew if they were departing on the downwind leg of the circuit, with no response received. Soon after, the parachute drop was completed. The pilot broadcast that the drop had been conducted and that three parachute canopies would be deploying below 5,000 ft.

At about 1021, the crew of ZLJ asked the pilot of OZA to confirm that the drop had been completed; the pilot replied ‘affirm’. The crew then queried whether the pilot of OZA was aware that ZLJ was departing overhead the airport, to which the pilot replied ‘negative’. At that time, ZLJ was climbing through 3,500 ft and tracking to overhead the airport (Figure 1).

The crew of ZLJ then questioned the altitude, time and position the parachutists had been dropped. The pilot of OZA advised that they had been dropped about 0.4 NM to the west of the airport, overhead the racecourse, about 30 seconds prior.

The crew of ZLJ immediately turned the aircraft left, attempted to establish the likely position of the parachutists, and advised the pilot of OZA that they would remain over the water. They continued to parallel their intended departure track over water until about 10 NM to the south of the airport. The flight continued without further incident.

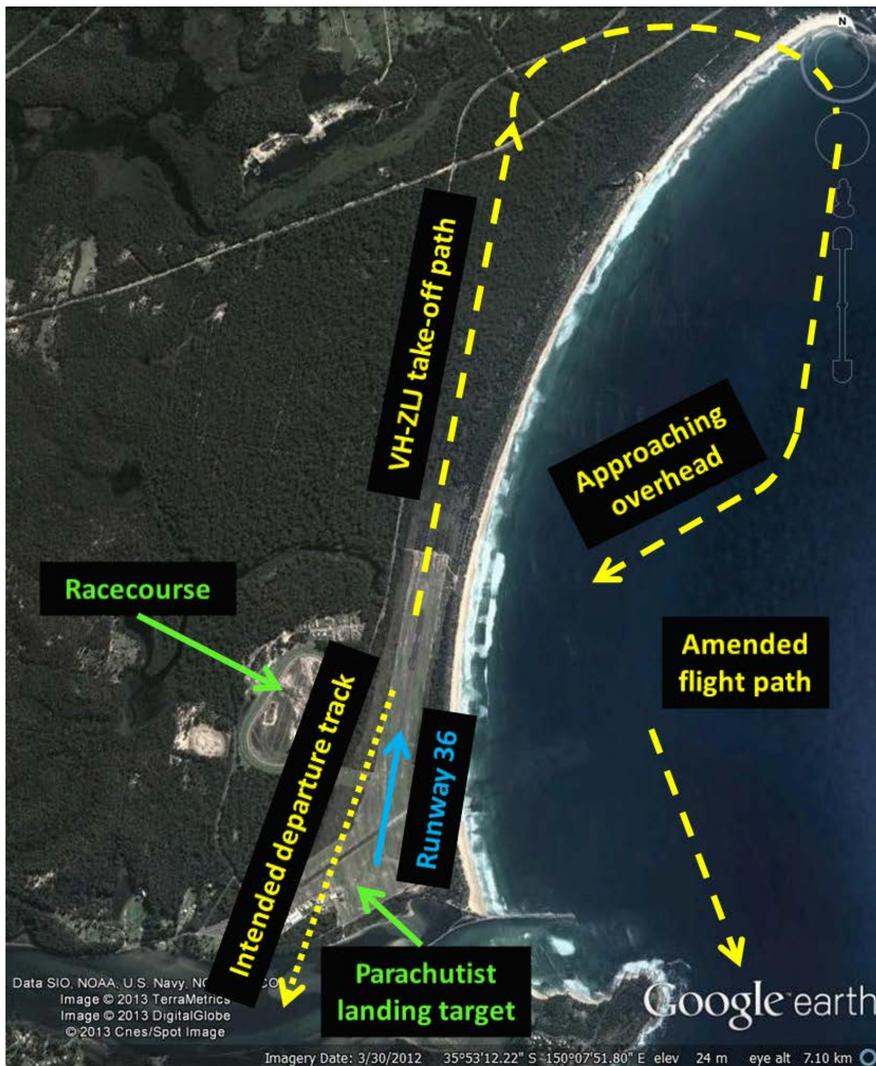
---

1 Eastern Standard Time (EST) was Coordinated Universal Time (UTC) + 10 hours.

2 At altitudes above 10,000 ft in Australia, an aircraft’s height above mean sea level is referred to as a flight level (FL). FL 150 equates to 15,000 ft.

3 All broadcasts made on the CTAF by the pilots of OZA and ZLJ were verified by the ATSB.

Figure 1: Approximate position of VH-ZLJ and parachutists



Source: Google earth

Moruya parachute operations

The parachute operator's 'Cloud Jumping Manual' stated that:

> Once a Regional Express aircraft has broadcast that it is taxiing for departure, the pilot in command must not allow parachutists to exit until the Regional Express aircraft is clear of 10 NM from the DZ [drop zone].

Regional Express had a Letter of Agreement (LOA) with the parachute operator in relation to operations at Moruya.

Pilot comments (VH-OZA)

The pilot provided the following comments regarding the incident:

- On most occasions, the scheduled passenger flights departing Moruya for Merimbula from runway 36 have conducted a left turn after take-off to intercept the departure track of 178° (True), remaining at least 2 NM away from the drop zone. The pilot stated that he had become complacent with applying the required procedures as he had conducted in excess of 400 parachute drops at Moruya in the previous 8 months and had expected ZLJ to depart as per previous occasions.
- He was experiencing time pressures due to holding at FL 150 for 8-9 minutes while ZLJ was taxiing, holding and departing.

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

Parachute operator (VH-OZA)

As a result of this occurrence, the operator of VH-OZA has advised the ATSB that they have distributed a letter to all company pilots detailing the incident and highlighting the importance of not becoming complacent with procedures.

Safety message

Complacency, the feeling of satisfaction or contentment with what is happening, may occur from a pilot's overconfidence in performing a task that has been previously conducted numerous times, without incident. This may result in a pilot inadvertently overlooking important information or responding to a situation inappropriately.[4]

This incident highlights the impact complacency and time pressures can have on aircraft operations. It is important that pilots remain vigilant and alert, and be mindful that the even the most routine tasks must be conducted with care and concentration. Furthermore, when time pressures do occur, it is a useful strategy for pilots to take the time to re-evaluate the task and their priority.[5]

General details

Occurrence details

Date and time:	12 September 2013 – 1021 EST	
Occurrence category:	Serious incident	
Primary occurrence type:	Aircraft separation	
Location:	Moruya, New South Wales	
	Latitude: 35° 53.87' S	Longitude: 150° 08.67' E

Aircraft details: VH-ZLJ

Manufacturer and model:	SAAB Aircraft Company 340B	
Registration:	VH-ZLJ	
Operator:	Regional Express	
Serial number:	340B380	
Type of operation:	Air transport – low capacity	
Persons on board:	Crew – Unknown	Passengers – Unknown
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

4 www.skybrary.aero/index.php/Discipline_(OGHFA_BN)
5 http://asrs.arc.nasa.gov/docs/rs/43_Time_Pressure_as_a_Causal_Factor.pdf

Wirestrike involving an Air Tractor AT 502, VH-CJY

What happened

On 15 October 2013, the pilot of an Air Tractor AT-502 aircraft, registered VH-CJY, was preparing to conduct aerial spraying operations about 33 km west of Temora, New South Wales.

The owner of the property had provided the pilot with a map of the area to be sprayed, which included powerlines (Figure 1).

Prior to commencing spraying, the pilot overflew the paddock twice, to formulate a spraying plan. The pilot identified the powerlines marked on the map and looked for others that may not have been depicted. The pilot reported that, as wires are generally difficult to see, he looked for clues that would indicate the presence of powerlines, such as poles, houses, cross arms and insulators. He observed a derelict homestead to the south of the paddock, but assessed that it was unlikely there would be any associated powerlines, and did not see any indications of other wires in the area.

The pilot elected to spray the paddock using a north-south pattern and set up the aircraft's global positioning system (GPS) to fly a race-track pattern over the paddock.

There was a road and a row of trees to the south of the paddock, with double power lines (as marked on the map) about 130 m north of the tree-line (Figure 2). The pilot planned to fly over the trees and under the power lines on each leg, before turning to commence the next run.

At about 1730 Eastern Daylight-saving Time (EDT),[1] when to the south of the paddock at about 15-20 ft above ground level (AGL), after turning to commence the next run, the pilot saw a cross arm indicating the presence of a wire attached to the derelict homestead (Figure 2). He decided not to climb the aircraft as it would have collided with the larger double power lines. The pilot then heard a bang, with the aircraft's propeller spinner contacting the wire.

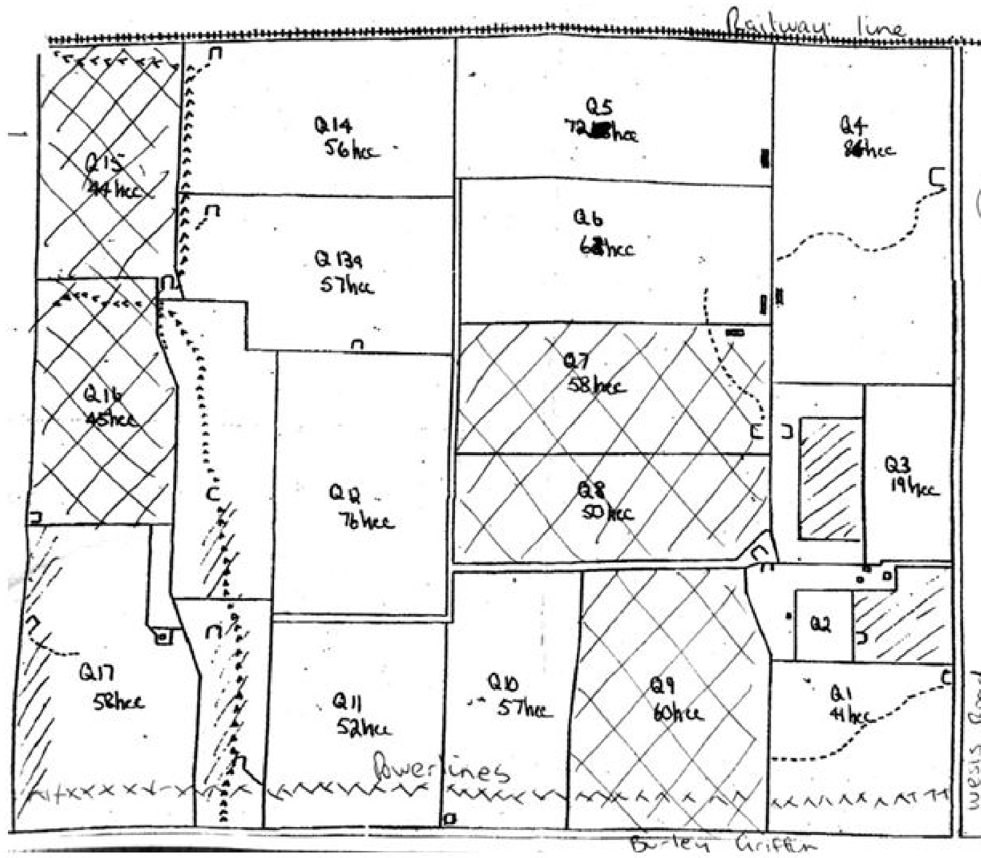
The pilot flew the aircraft under the double power lines and climbed to about 150 ft AGL. The engine was vibrating, but continued to produce power. The pilot elected to continue towards the airstrip and not to release the chemical load to minimise the environmental impact.

The engine then steadily lost power. The pilot secured the engine and conducted a forced landing in a paddock. During the landing, the aircraft ground-looped and the left wing contacted the ground. The aircraft was substantially damaged and the pilot was not injured.

The pilot did not see the wire at any stage, nor was it marked on the map provided by the property owner.

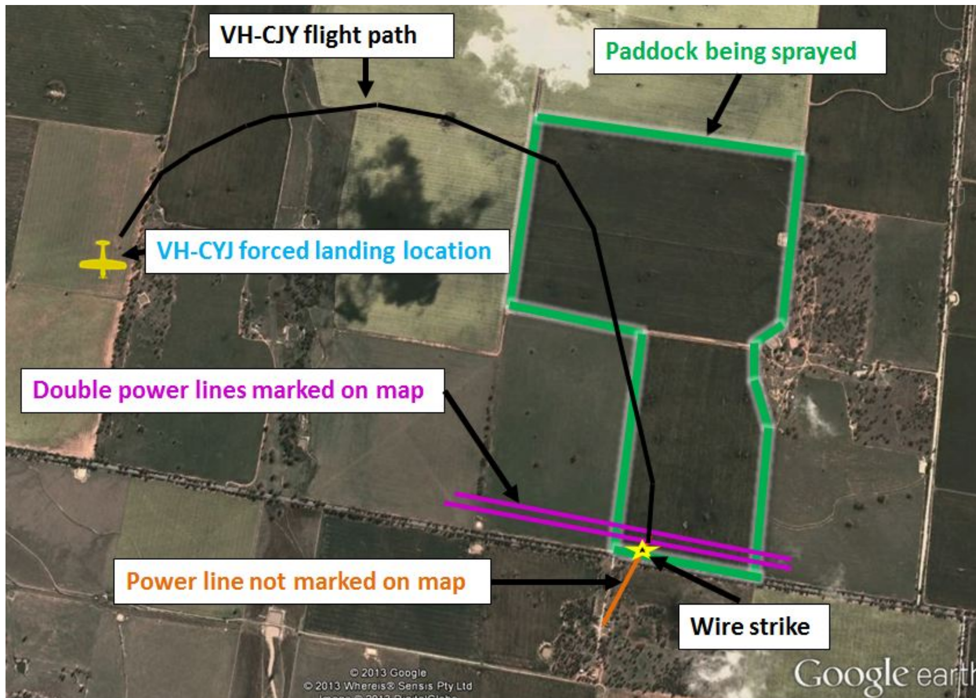
[1] Eastern Daylight-savings Time (EDT) was Coordinated Universal Time (UTC) + 11 hours.

Figure 1: Map of property to be sprayed



Source: Pilot

Figure 2: Property, location of wires and flight path of VH-CJY



Source: Google earth and pilot

Pilot comments

The pilot reported the following observations:

- His attention was divided between looking outside and watching the GPS.
- If he had released the chemical load after striking the wire, the aircraft may have had improved performance and sustained less damage on landing.
- Some operators provide the pilot with a Google Earth map and an overlay file provided by the energy company with all powerlines marked. Use of this technology improves the completeness of information provided to the pilot and reduces the risk of wirestrike.

In addition, the pilot reported that he had in excess of 22,000 hours of flying experience in agricultural aircraft and helicopters. He had devised a three-step procedure to minimise the risk of wire strike, which had been incorporated into wire awareness training courses:

1. ***F****ind the wires:* conduct a fly-around, look for indicators of wires.
2. ***F****ormulate a plan* to do the job and minimise exposure to the wires.
3. *Don't* ***F****orget them:* keep the wire hazards front-of-mind by using 'single-crew CRM'[2]: speak aloud as you cross the wire, brief yourself about the location of each wire.

Safety message

Research conducted by the ATSB identified 180 wirestrike accidents between 2001 and 2010. Of these, 100 occurred during agricultural operations. The research also found that 63 per cent of pilots were aware of the wire before they struck it. Not all wires are marked; with unmarked wires difficult to see with the naked eye.

The report advises pilots to have an up-to-date and detailed map with powerlines and other hazards clearly marked. Some power companies have coverage maps available to the public. Pilots of some wirestrike accidents reported to the ATSB that the maps they received from clients did not have powerlines clearly marked on the map.

It further cautions pilots not to rely on the maps and to conduct an aerial reconnaissance to confirm wire locations and other hazards. Having a plan and a procedure to minimise the risk of wirestrike is a valuable mitigation strategy. The ATSB report *Wirestrikes involving known wires: A manageable aerial agriculture hazard* is available at http://www.atsb.gov.au/publications/2011/avoidable-2-ar-2011-028.aspx.

For further risk management strategies for agricultural operations, the Aerial Application Pilots Manual is available from www.aerialag.com.au/Home.aspx.

[2] CRM: Crew resource management

General details

Occurrence details

Date and time:	15 October 2013 – 1800 EDT	
Occurrence category:	Serious incident	
Primary occurrence type:	Wirestrike	
Location:	near Temora Aerodrome, New South Wales	
	Latitude: 34° 25.28' S	Longitude: 147° 30.70' E

Aircraft details

Manufacturer and model:	Air Tractor Inc.	
Registration:	VH-CJY	
Serial number:	5002-0093	
Type of operation:	Aerial work - agriculture	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Minor	

Piston aircraft

Landing on a closed runway involving a Cessna 404, VH-HVR

What happened

On 24 July 2013, the pilot of a Cessna 404 aircraft, registered VH-HVR, was preparing for a charter flight from Darwin to the Pigeon Hole aeroplane landing area (ALA), Northern Territory. The purpose of the flight was to pick up passengers and return to Darwin.

In preparation for the flight, the pilot used the operator's electronic flight planning system to generate the flight plan, which also provided coordinates for the ALA and stated that the runway direction was 18/36. The pilot reported that the coordinates for the ALA had been previously entered into the global positioning system (GPS), which was to be used throughout the flight for navigation assistance.

At about 1312 Central Standard Time,[1] the aircraft departed Darwin, about 45 minutes behind schedule. As the flight progressed, the pilot reported feeling tired.

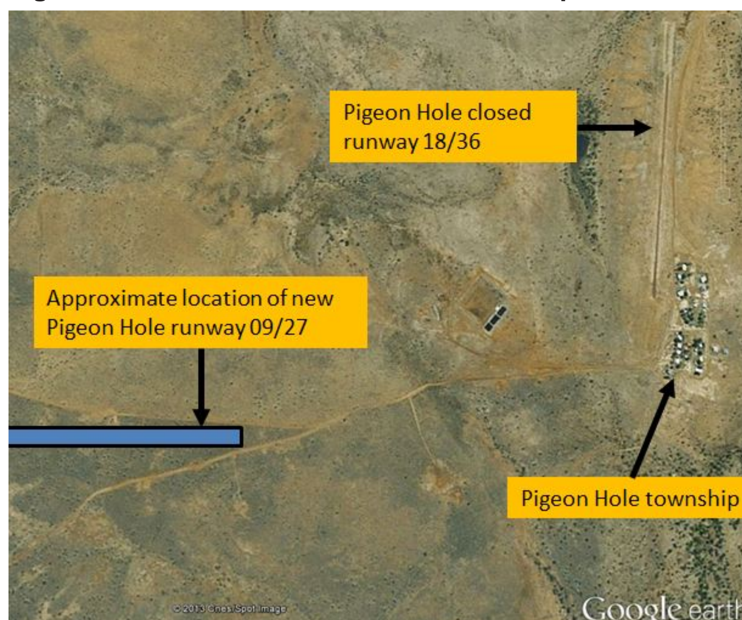
Given the wind conditions, the pilot elected to conduct a straight-in-approach to runway 18.

When about 15 NM from the ALA, the pilot sighted the runway. When at 5 NM, on final approach, the pilot assessed the condition of the airstrip and noticed that the runway surface appeared overgrown with vegetation. The pilot configured the aircraft for landing.

At about 1500 CST, when below 300 ft above ground level, the pilot noted that there were no runway strip markers or windsock. The pilot then realised that the airstrip was closed, but due to the aircraft's altitude, elected to continue the landing. During the landing, the aircraft struck vegetation, but the pilot did not believe the aircraft had collided with anything.

After landing, the pilot assessed the situation and elected to take off. During the take-off, the pilot confirmed that the engines were operating normally and after becoming airborne, observed the correct ALA about 2 km south-west of the Pigeon Hole Township (Figure 1).

Figure 1: Location of closed and new airstrip



Source: Google earth

[1] Central Standard Time (CST) was Coordinated Universal Time (UTC) + 9.5 hours.

The aircraft joined the crosswind leg of the circuit for runway 09. The pilot conducted the pre-landing checks and visually confirmed that there was no grass obstructing the landing gear. The aircraft landed without further incident.

The pilot conducted an inspection of the aircraft and noted that minor damage had been sustained to the leading edge of the right wing (Figure 2) and propeller.

Figure 2: Damage to leading edge

Source: Operator

Airstrip information

The original Pigeon Hole airstrip was an uncertified, unregistered aeroplane landing area (ALA), located north of the Pigeon Hole Township. The airstrip had one runway aligned 18/36. The airstrip was privately owned and operated. About 1-2 years prior to the incident, the airstrip was closed. A new airstrip was developed about 2 km south-west of the Township, with one runway aligned 09/27.

The operator reported that, due to the proximity of the new airstrip to the closed airstrip and the fact that the latitude and longitude were provided in degrees and minutes only, the coordinates for both airstrips were the same. Furthermore, the operator's 'ALA book'[2] indicated that the runway direction was 09/27, but the electronic flight planning system indicated the runway was 18/36. The Aircraft Owners and Pilots Association of Australia (AOPA) National Airfield Directory 2012 also indicated the runway was 18/36.[3]

Pilot comments

The pilot provided the following comments regarding the incident:

- There were no markings observed on the runway to indicate that the airstrip was closed.[4]
- If the pilot was aware that the 404 aircraft had previously been flown into the airstrip and/or the condition of the runway could be visually confirmed during the approach, an overfly of the airstrip was not generally conducted.

---

[2] The ALA book contained information on the airstrips used by the operator.

[3] Information contained in the AOPA National Airfield Directory is provided for general guidance only and the accuracy of the information has not been verified.

[4] The Aeronautical Information Publication (AIP) AD 1.1 paragraph 4, subparagraph 3.3.2 states that: 'When an aerodrome that does not have 24 hour ATC [air traffic control] coverage is completely unserviceable for all operation, an unserviceability cross marker is displayed in the signal circle'.

- The pilot had commenced work at 0700 and had accrued about 4.5 hours flight time prior to departing Darwin. On arrival at the airstrip, the pilot reported feeling tired after a further 2 hours of flight time, which may have affected the decision to continue with the landing, instead of conducting a go-around. This may also have affected the pilot's reaction time in making decisions and assessing the situation. The pilot determined that, given the height of the aircraft above the ground and its configuration, it was not safe to go around.
- The pilot had operated into the new Pigeon Hole airstrip on two occasions, about 4months prior to the incident. However, over the previous 6 months, the pilot had flown to over 40 airstrips and relied on the operator's electronic flight planning system and ALA book, rather than memory, for airstrip information.
- The information contained in the operator's flight planning system and the coordinates entered into the GPS were for the closed airstrip. After the incident, the pilot referenced the ALA book and noted that the runway direction had previously been updated and a note regarding the closed airstrip was included.
- The pilot reported that the operator's ALA book was referenced for the first 9 months of employment and when operating into an unknown airstrip, but for the incident flight, the book was not used.
- Most of the airstrips the company operates into are remote, and obtaining reliable information regarding the condition of the airstrip can be difficult.
- Planning to overfly and inspect a runway can add time to the flight, but may prevent similar incidents occurring.

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

Operator

As a result of this occurrence, the aircraft operator has advised the ATSB that they are taking the following safety actions:

- ***Closed airstrip***: They have asked the owners of the closed airstrip to place unserviceability cross markers at either end of the runway.
- ***Pilot responsibilities***: Company pilots will be reminded of their responsibilities regarding the use of ALA's and the need to check and confirm all details contained in the ALA book prior to the commencement of a flight.
- ***Electronic flight planning system***: The operator's electronic flight planning system has been updated to ensure that the information on Pigeon Hole (ALA) is current.
- ***ALA book***: Information for Pigeon Hole in the ALA book had been updated in June 2011 with the new runway direction and a note stating that the old (closed) airstrip located north of Township was not to be used. Since the incident, this information has been made more visible in the book, with the appropriate text highlighted.
- ***Incident***: For learning purposes, the incident will be discussed at the next pilot meeting.
- ***Pilot proficiency checks***: Pilot proficiency checks will include a requirement to conduct an all-engines operating go-around from 50 ft.

Safety message

This incident highlights the importance of reviewing all available information appropriate to the intended operation, including the condition and suitability of the selected landing area/s, and ensuring that operational documents are current. It also demonstrates the benefits of overflying an airstrip to assist with determining the suitability of the landing area and the need to be go-around prepared and go-around minded.

General details

Occurrence details

Date and time:	24 July 2013 – 1500 CST	
Occurrence category:	Serious incident	
Primary occurrence type:	Navigation event	
Location:	near Pigeon Hole (ALA), Northern Territory	
	Latitude: 16° 49.00' S	Longitude: 131° 13.00' E

Aircraft details

Manufacturer and model:	Cessna Aircraft Company 404	
Registration:	VH-HVR	
Serial number:	404-0673	
Type of operation:	Charter	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Minor	

Fuel starvation event involving a Beech BE58, VH-ECL

What happened

On 14 August 2013, at about 0830 Central Standard Time,[1] the pilot of a Beech BE58 aircraft, registered VH-ECL (ECL) (Figure 1), was preparing for a charter flight from Tindal to the Borroloola aeroplane landing area (ALA), Northern Territory.

Figure 1: VH-ECL

Source: Operator

The previous night, the pilot received details of the flight. Using the operator's elected fuel flow rate for the aircraft of 125 L/hr, the pilot calculated that a minimum of 545 L of fuel was required. The pilot elected to carry 570 L.

On the following day, in preparation for the flight, the pilot referenced the flight data log (FDL),[2] which indicated that about 267 L of fuel was onboard the aircraft. Consequently, the pilot refuelled the aircraft by adding about 153 L into each of the main fuel tanks.[3] The pilot then conducted fuel drains and found no contaminants present. The pilot also reported that, when conducting engine run-ups, the fuel quantity gauges were indicating as expected.

The passengers boarded the aircraft and the flight departed Tindal.

During the cruise, the pilot observed the fuel quantity gauge for the right main fuel tank reading zero, but the fuel flow, and engine temperature and pressure indications were normal.

The aircraft landed at Borroloola and the passengers disembarked. The pilot re-checked the fuel calculations and determined that there was sufficient fuel on board for the return trip. The pilot noted that the right fuel quantity gauge was still reading zero and the fuel quantity gauge for the left main tank was indicating about ¾ full.

---

[1] Central Standard Time was Coordinated Universal Time (UTC) + 9.5 hours.

[2] The amount of fuel uploaded and amount of fuel used during a flight is recorded on the FDL. From this, pilots can determine how much fuel is onboard the aircraft.

[3] The aircraft was fitted with main and wing tip fuel tanks in each wing. On each side, the main and wing tip tank were interconnected and fuel used was drawn from the combined tanks. Filling the main tanks resulted in a 'known' fuel quantity of 628 L when both the left and right main tanks were full.

On the return flight, when about 50-60 NM from Tindal, the right fuel flow gauge dropped to zero. The pilot immediately placed the fuel mixture for the right engine in the full forward position and observed the right fuel flow gauge fluctuate, before returning to zero. The pilot completed the engine failure emergency checklist and determined that the most likely reason would have been insufficient fuel remaining in the right main tank. The pilot also reviewed the fuel calculations performed prior to the flight, which indicated that there should have been fuel remaining in the right main tank.

The pilot shut down the right engine and elected not to cross-feed fuel from the left main fuel tank into the right main fuel tank as the cause of the apparent excessive fuel burn on the right engine could not be determined.

The pilot notified air traffic control and conducted a single-engine landing at Tindal.

The useable fuel on board the aircraft after landing was later determined as 98 L in the left tanks and 0 L in the right tanks.

Aircraft information

The pilot reported that, due to the design of the aircraft's wings, it was not possible to determine the fuel quantity in each tank by visual inspection, unless the main tank and/or wing tip tank was full. Due to the wing dihedral,[4] the fuel filling points on each wing were positioned higher than the substantive volume of the fuel tanks. Consequently, when the fuel tanks were less than full, if a dipstick were used through the filling points, it would indicate low or nil fuel was onboard, but fuel would be remaining below the filling point.

The aircraft was fitted with internal fuel quantity gauges in the cockpit and external (direct reading) gauges on each wing.[5]

Fuel quantity and fuel flow determination

Fuel quantity

The exact quantity of fuel in the tanks could only be determined when the aircraft was fully fuelled. Fuel quantity was then estimated from when the tanks were last filled up to full and the calculated fuel remaining as recorded on the FDL. The internal fuel gauges provided a representation of the fuel onboard in quarterly increments. The direct reading gauges were calibrated between 182 L (40 US Gallons) and 227 L (60 US Gallons), but not precise outside of that range.

Fuel flow

The fuel flow rate for the aircraft was determined from the aircraft's operating handbook. This was then compared to 'actual' fuel flow rate figures recorded on the FDL. The operator also kept a spreadsheet of the fuel burn and provided monthly trend data to the company pilots. Based on this information, the operator had distributed a memorandum to pilots regarding ECL, stating that the right engine was using more fuel than the left engine.

The pilots had also been advised to use a fuel flow rate of 125 L/hr for ECL. The pilot on the incident flight reported that, prior to this; they had been using a rate of 130 L/hr.

ECL had last been filled to full on 16 May 2013 and 9,750 L of fuel had been added since that time.

---

4 Dihedral is the acute angle between the wing and the lateral axis.

5 The internal gauges were electric free floating within the bladder tanks in the wings and interlinked to the gauge in the cockpit. The direct gauges were mechanical, floating on a screw that adjusts the gauge.

Engineering inspection

After the incident, an engineering inspection of the internal and direct reading fuel gauges was conducted. The internal gauges were consistent through the range of testing, but the direct reading gauge for the right tanks was unserviceable. The day after the incident, the direct reading gauge was reading correctly, indicating that it may have become stuck and then resolved again. It was determined that the right internal fuel quantity gauge was intermittently faulty.

Guidelines for aircraft fuel requirements

The Civil Aviation Safety Authority Civil Aviation Publication (CAAP) 234-1(1): Guidelines for Aircraft Fuel Requirements[6] states that:

> Unless assured that the aircraft tanks are completely full, or a totally reliable and accurately graduated dipstick, sight gauge, drip gauge or tank tab reading can be done, the pilot should endeavour to use the best available fuel quantity cross-check prior to starting. The cross-check should consist of establishing fuel on board by at least two different methods…

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

Operator

As a result of this occurrence, the aircraft operator has advised the ATSB that they are taking the following safety actions:

- ***Operations manual:*** The operations manual and electronic flight planning system have been amended to indicate that the fuel flow rate for the aircraft is 130 L/hr.
- ***Flight data log (FDL) option:*** The operations manual will be amended so that the letter 'G' can be placed on the FDL indicating that the fuel figure was obtained with reference to the fuel gauge. The manual already included options for 'C' (calculated), 'K' (known) and 'D' (dipped) to be entered on the FDL. This will assist as a reminder to pilots that the fuel gauge is a viable means to attain fuel data for comparison and cross checking.
- ***Fuel:*** Fuel tanks are to be filled to full once per month to assist in fuel quantity calculations.

Safety message

On average, the ATSB receives 21 reports of fuel exhaustion or starvation occurrences each year. Research[7] conducted by the ATSB indicated that fuel mismanagement was three time more likely to involve fuel starvation than exhaustion, and was more likely to occur in private and charter operations. Furthermore, for reported fuel starvation occurrences, 46 per cent led to a forced or precautionary landing or ditching, 22 per cent led to a diversion or return to the aerodrome and 7 per cent resulted in a collision with terrain.

This incident highlights the importance of establishing a known fuel status regularly and the need to use multiple sources to determine fuel quantity. This is particularly important for determining accurate fuel flow rate calculations and when the fuel quantity onboard can only be accurately determined when the fuel tanks are full.

---

[6] www.casa.gov.au/download/caaps/ops/234_1.pdf

[7] *Avoidable Accidents No. 5 – Starved and exhausted: Fuel management aviation accidents* is available at www.atsb.gov.au/publications/2012/avoidable-5-ar-2011-112.aspx

General details

Occurrence details

Date and time:	14 August 2013 – 1130 CST	
Occurrence category:	Incident	
Primary occurrence type:	Fuel starvation event	
Location:	111 km east of Tindal Airport, Northern Territory	
	Latitude: 14° 35.02' S	Longitude: 133° 24.42' E

Aircraft details

Manufacturer and model:	Beech Aircraft Corporation BE58	
Registration:	VH-ECL	
Serial number:	TH-1078	
Type of operation:	Charter	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	None	

Loss of control involving a Piper PA 28R-200, VH-MMU

What happened

On 6 September 2013, at about 1220 Eastern Standard Time,[1] a Piper PA-28R-200 aircraft, registered VH-MMU, was being operated on a private flight from White Cliffs, New South Wales to Birdsville, Queensland. On board the aircraft were the pilot and a passenger.

At the time, the annual Birdsville horse race meeting was being held. Consequently, Airservices Australia released Aeronautical Information Publication Supplement (AIP SUP) H87/13 and issued a Notice to Airmen (NOTAM) detailing the arrival/departure procedures for the duration of the race meeting.

At about 1230, the pilot commenced a descent to 1,500 ft above ground level (AGL) overhead the racecourse, as stipulated in the AIP SUP.

During the flight, the pilot and passenger obtained updated weather information from an iPad tablet computer. The passenger, also a pilot, was trialling the electronic in-flight information for the first time. From this, the pilot reported the winds had been fluctuating, at times indicating 010 °T at 10 kt, but as they approached Birdsville, the wind was 040 °T at 10-15 kt.

The pilot and passenger discussed the most appropriate runway to use for landing. As the aircraft approached the race course, they heard the pilot of another aircraft on the common traffic advisory frequency (CTAF) using runway 32, so elected to join the circuit for this runway. They were aware that this would result in a significant crosswind component, but had concluded that they would fit in with the traffic, and that the runway length (1,732 m) was sufficient, even with the reduced headwind.

The aircraft joined the circuit for runway 32 at 1,000 ft above ground level (AGL). While joining the circuit, the pilot extended the landing gear and prepared the aircraft for landing.

When on the downwind leg of the circuit, the pilot noted that the only other aircraft operating in the CTAF at that time had landed and was clear of the runway. When late downwind, the pilot reduced the aircraft's airspeed from 120 kt to 110 kt and lowered the first stage of flap. Shortly after, he selected the second stage of flap. He recalled having an indicated airspeed of about 85 kt on base and with the third stage of flap lowered 75 kt on final approach. .

During the race meeting, the approach to runway 32 placed the aircraft over raised ground and a high fence, where much of the crowd were situated. To remain at a safe height above the crowd, the passenger, a more experienced pilot, suggested that the pilot keep the aircraft at least 50 ft above the runway threshold and then flare soon after.

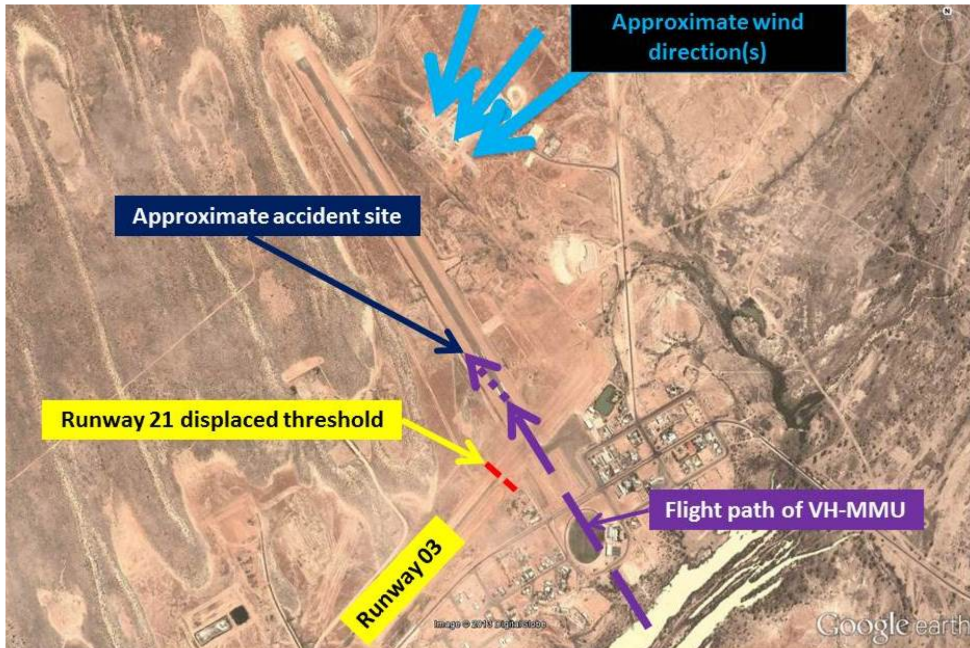
The pilot attempted to comply with this suggestion and prepared for the landing flare, but the passenger advised him that they were too high and not to reduce the engine power until the aircraft was in a safer landing configuration. The pilot lowered the aircraft's nose slightly and initiated the flare. The aircraft landed firmly on the main landing gear, then bounced once or twice. As the aircraft bounced, the pilot felt the crosswind move the aircraft to the left of the runway. The pilot still believed he could safely complete the landing and elected to continue.

He attempted to keep the aircraft aligned with the runway and slow down. To allow for the crosswind, the pilot held the ailerons at full deflection. However, as the aircraft drifted to the left in the crosswind, the left main wheel struck a graded mound on the side of the runway. The aircraft stopped abruptly and rotated in an anticlockwise direction, resulting in the right landing gear

[1] Eastern Standard Time (EST) was Coordinated Universal Time (UTC) + 10 hours.

entering a ditch. The aircraft continued over the mound for about another 10 ft, before coming to rest (Figure 1).

Figure 1: Landing flight path of VH-MMU



Source: Google earth

The pilot checked on his passenger before both egressed through the exit door on the passenger side of the aircraft. They remained clear of the aircraft until emergency services arrived. Both the pilot and passenger sustained minor injuries and the aircraft was substantially damaged (Figure 2).

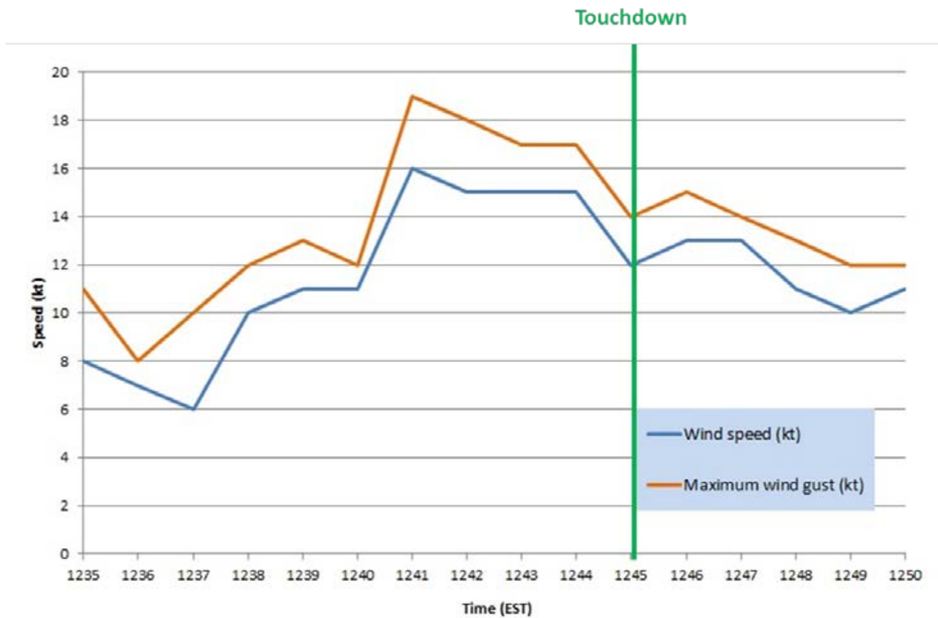
Figure 2: VH-MMU damage

Source: Queensland Police Service

Meteorological information

The Bureau of Meteorology (BoM) provided the ATSB with one-minute interval data recorded by the Birdsville automatic weather station (AWS). A graphical representation of the wind speed (kt) and maximum wind gust (kt) between 1235 and 1250 is shown in Figure 3

Figure 3: Bureau of Meteorology one-minute data



Source: Bureau of Meteorology

Birdsville race meeting operations

AIP Supplement (AIP SUP) H87/13

The AIP SUP provided comprehensive instructions for arriving and departing aircraft for the duration of the race meeting. Normal CTAF procedures applied; however, to assist with the large increase in aircraft movements, additional procedures were put in place. This included a reduction in the runway length available and restrictions on the use of runways 03/21. The following is an extract from *Section 5 – Runways* of the AIP SUPP:

> In the event of adverse wind conditions making the use of RWYs 14 or 32 hazardous for arriving aircraft, RWY 21 will be available at reduced length. Due to aircraft parked on the eastern end of this runway, RWY 03 will only be available for landings under exceptional circumstances. Pilots should consult NOTAM for LDAs,[2] TORAs,[3] TODAs[4] and their aircraft flight manuals and plan appropriately for contingency measures in this regard.

NOTAM information

The NOTAM current for Birdsville on 6 September 2013 also advised that the runway 21 threshold was displaced by 381 m and that this was appropriately marked (Figure 1). This effectively reduced the length of runway 03/21 to 819 m.

---

2 Landing distance available: the length of runway declared available and suitable for the ground run of an aircraft landing.

3 Take-off run available: the length of runway declared available and suitable for the ground run of an aircraft taking off.

4 Take-off distance available: the length of the take-off run available, plus the length of any clearway available.

Pilot comments

The pilot reported that the change from his normal routine of landing close to the threshold, the distraction of approaching over a crowd, and dealing with fluctuating wind conditions, increased his workload when landing at an unfamiliar aerodrome. In hindsight, he stated that he should have conducted a go-around earlier in the approach or gained approval to use runway 03.

Safety message

It is important to be aware that the presence of others may influence your decision-making process. Their apparent ability does not mean that others can achieve the same outcome. To be competent, pilots must know, and fly within their own personal limitations on that particular occasion. The following provide additional information on decision making scenarios:

- Decision making for general aviation pilots: www.easa.europa.eu/essi/egast/2011/04/decision-making/
- General Aviation Pilot's Guide to Preflight Weather Planning, Weather Self-Briefings, and Weather Decision Making: www.faa.gov/pilots/safety/media/ga_weather_decision_making.pdf

General details

Occurrence details

Date and time:	6 September 2013 - 1245 EST	
Occurrence category:	Accident	
Primary occurrence type:	Loss of control	
Location:	Birdsville aerodrome, Queensland	
	Latitude: 25° 53.85' S	Longitude: 139° 20.85' E

Aircraft details

Manufacturer and model:	Piper Aircraft Corporation PA-28R-200	
Registration:	VH-MMU	
Serial number:	28R-7335343	
Type of operation:	Private	
Persons on board:	Crew – 1	Passengers – 1
Injuries:	Crew – 1 (Minor)	Passengers – 1 (Minor)
Damage:	Substantial	

Engine fire involving a Beech A36, VH-FFY

What happened

On 6 September 2013, at about 1545 Eastern Standard Time,[1] a Beech A36 aircraft, registered VH-FFY, taxied for a private flight from the Caloundra aeroplane landing area (ALA) to Archerfield, Queensland with the pilot and two passengers on board.

The pilot reported that, during the take-off run, all engine indications were normal. When 200 ft above ground level (AGL), the pilot detected a burning smell and observed smoke entering the cockpit from the pilot foot-well. The engine continued to produce power. At about 300 ft AGL, as the area was heavily forested, the pilot commenced a turn back to the runway for landing.

The pilot opened the left side storm window to draw the smoke out of the cockpit and reduced power. The engine then began to run rough. The pilot elected to conduct a forced landing and selected a suitable paddock. The pilot shut down the engine and prepared the aircraft for landing.

During the landing roll, the nose landing gear separated from the aircraft due to the uneven terrain and the propeller subsequently contacted the ground (Figure 1). One passenger sustained minor injuries.

After the accident, the exhaust tailpipe from the turbocharger assembly was found on the runway at Caloundra. An engineering inspection revealed that the tailpipe had separated at a weld joint.

Figure 1: Damage to VH-FFY

Source: Operator

Fitment of the turbo-normalizing system

In August 2013, a Tornado Alley Turbo turbo-normalizing system had been fitted to the aircraft under a Supplemental Type Certificate (STC). The ATSB was advised by the manufacturer that about 800 Beech Bonanzas, including the A36 model, were equipped with the turbo-normalizing system, without any such incident having been reported previously. The weld joint at the tailpipe/flange was tack-welded[2] when provided to the installer to allow for proper positioning, with

---

1 Eastern Standard Time (EST) was Coordinated Universal Time (UTC) + 10 hours.

2 A small dab of weld metal making a local link to hold parts in the correct location while the main weld is made.

the requirement to fix that position and then perform circumferential welds.[3] This requirement was detailed in the installation instructions provided to the installer.

At the same time as the installation of the turbo-normalising system, the aircraft had undergone a routine 100 hourly maintenance inspection. The aircraft had completed 15 hours of flying since the installation and maintenance, during which time minor adjustments to the fuel flow and magneto timing had been made.

Pilot comments

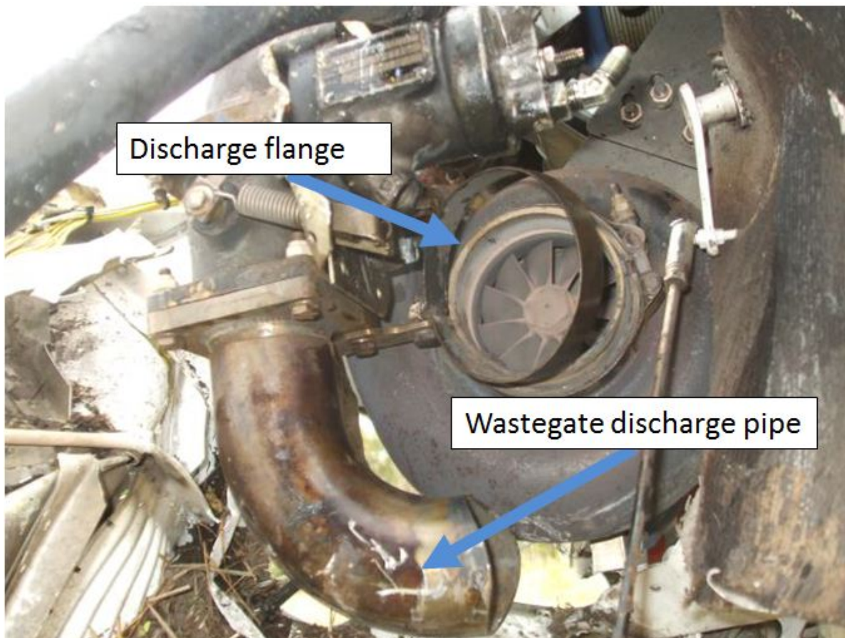
The pilot reported that, due to the turbo installation, the fuel mixture setting for take-off was higher than normal. The rough running experienced after the power reduction may have been due to the fuel mixture being too rich for the reduced power setting. However, at the time the pilot had insufficient altitude to investigate the situation.

Insurance assessment report

The insurance assessment reported the following:

- the turbo-normalizing modification required a redesign of the aircraft's exhaust system to incorporate the turbocharger
- the separated segment of the exhaust system was the tailpipe, which captured the turbocharger discharge gases and the outflow of the bypass system, and expelled them (Figure 2)
- the installation instruction, which required the installer to perform the final welding (circumferential) of the flange and pipe, had not been completed. The attachment of the tailpipe was, therefore, reliant on the manufacturer's temporary tack welds
- inspection of the recovered tailpipe, turbo flange, and wastegate discharge pipe showed that the pipe and flange tack welds had failed, allowing the tailpipe to separate from the aircraft (Figure 3)
- the hot gas from the turbo-normalizing system was discharged directly onto the wiring, hoses and firewall blanket, which subsequently resulted in the smoke and fumes.

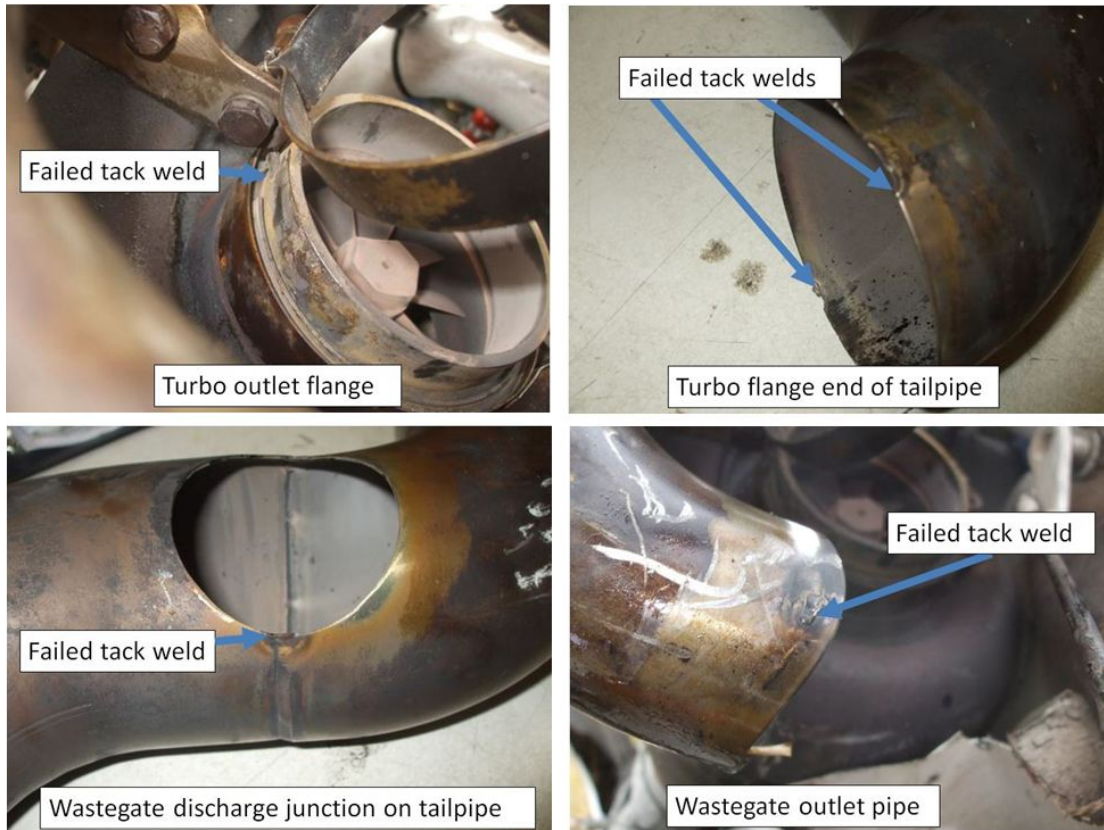
Figure 2: Turbocharger outlet and wastegate



Source: Insurance assessor

[3] A type of weld produced around the outer surface of a cylindrical part.

Figure 3: Failed tack welds



Source: Insurance assessor

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

Tornado Alley Turbo (manufacturer)

As a result of this occurrence, the turbo-normalizing system manufacturer has advised the ATSB that the requirement to complete the circumferential weld will be highlighted in the installation instructions. The tailpipe supplied will also be clearly marked as supplied tack-welded, with additional instructions showing the requirement to perform the circumferential weld prior to flight.

Safety message

A partial engine power loss presents a more complex situation to the pilot than a complete power loss. As detailed in the *Avoidable Accidents No. 3 – Managing partial power loss after takeoff in single-engine aircraft* booklet, www.atsb.gov.au/publications/2010/avoidable-3-ar-2010-055.aspx, an ATSB study of 242 partial power loss occurrences between 2000 and 2010, revealed that there were 21 events after take-off where the pilot conducted a forced or precautionary landing beyond the aerodrome boundary.

In a partial engine power loss event, the engine may not be relied on to continue to provide any level of power. Therefore, it may be advantageous to conduct a forced or precautionary landing as if experiencing a total engine failure, as it removes the variability and unknown reliability of some engine power, particularly where there are suitable landing options available. Moreover, all pilots are specifically assessed and trained to deal with a complete engine failure after take-off.

General details

Occurrence details

Date and time:	6 September 2013 – 1600 EST	
Occurrence category:	Accident	
Primary occurrence type:	Inflight fire	
Location:	near Caloundra (ALA), Queensland	
	Latitude: 26° 48.12' S	Longitude: 153° 06.32' E

Aircraft details

Manufacturer and model:	Beech Aircraft Corporation A36	
Registration:	VH-FFY	
Serial number:	E1583	
Type of operation:	Private	
Persons on board:	Crew – 1	Passengers – 2
Injuries:	Crew – Nil	Passengers – 1 (Minor)
Damage:	Substantial	

Runway incursion involving a De Havilland DH 82, VH-BJE and a Piper PA 34, VH-SEN

What happened

On 8 September 2013, the pilot and passenger of a De Havilland DH-82A aircraft, registered VH-BJE (BJE), were conducting a local scenic flight from the Redcliffe aeroplane landing area (ALA).

At about 1615 Eastern Standard Time,[1] the pilot broadcast a taxi call on the common traffic advisory frequency (CTAF) and commenced taxiing via the eastern-most taxiway toward runway 07 (Figure 1). The pilot then reported broadcasting a call advising that he was entering and backtracking runway 07. The aircraft was backtracked on the grass on the southern side of the sealed runway.

At the same time, the pilot of a Piper PA-34 aircraft, registered VH-SEN (SEN), broadcast a taxi call on the CTAF and taxied from the eastern taxiway behind BJE, then turned onto the sealed taxiway to runway 07. When SEN arrived at the intersection between the western taxiway and runway 07, the pilot reported that he broadcast his intention to line up after an aircraft on final had landed.

The pilot of BJE reported taxiing off the flight strip, outside the gable markers, to allow the aircraft on final to land and vacate the runway. He then reported broadcasting a lining up and rolling call and lined up on the grass to the right of the sealed runway.

At about the same time, the pilot of SEN also broadcast a call advising he was entering, lining up and rolling on runway 07. The pilot of BJE heard the pilot of SEN broadcast the call. He looked back and observed SEN lined up on the sealed runway. He immediately broadcast a call requesting the pilot of SEN delay his take-off as BJE was within the confines of the flight strip. The pilot of SEN had also observed BJE about 100 m ahead on the grass, to the right, and reported rejecting the take-off and making a call to the pilot of BJE requesting his intentions. The pilot of BJE then commenced a turn towards the gable markers.

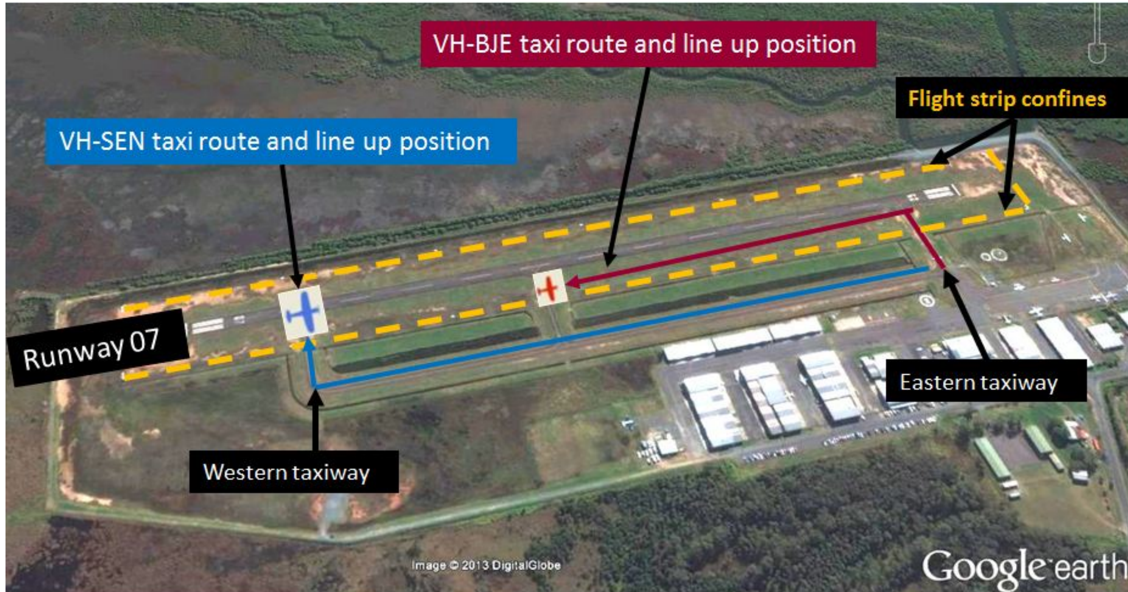
Shortly after, SEN recommenced the take-off. When SEN passed BJE, the pilot of BJE reported that his aircraft was still within the flight strip and estimated that the aircraft came within 10-15 m of each other.

The pilot of BJE did not hear the intention to line up call from SEN and the pilot of SEN reported not hearing the lining up and rolling call from BJE.[2]

1 Eastern Standard Time (EST) was Coordinated Universal Time + 10 hours.

2 Any radio broadcasts made by the pilots could not be verified as transmissions at Redcliffe were not recorded.

Figure 1: Approximate positions of VH-BJE and VH-SEN



Source: Google earth

Pilot comments (VH-BJE)

The pilot of BJE provided the following comments:

- As BJE does not have brakes, he operates on the grassed area as the aircraft is difficult to manoeuvre on the sealed area.
- He has been operating at Redcliffe for over 20 years and moves BJE outside the flight strip if an aircraft is on final and broadcasts a call advising that he is 'moving over'.
- The pilot of another aircraft in the circuit at the time of the incident reported that a broadcast for BJE and SEN had been over-transmitted and were therefore inaudible.

Pilot comments (VH-SEN)

The pilot of SEN provided the following comments:

- He knew BJE had been backtracking, but was not aware that it had turned to line up.
- After rejecting the take-off, he broadcast a call to BJE requesting the pilot's intentions, but did not receive a response. He did not hear any calls from BJE other than the taxi call.
- He did not believe there was sufficient room for BJE to be manoeuvred completely clear of the active runway and outside the gable markers.
- There was sufficient clearance to take-off once BJE had moved to the gable markers.

Safety message

The ATSB SafetyWatch highlights the broad safety concerns that come out of our investigation findings and from the occurrence data reported to us by industry. One of the safety concerns is safety around non-towered aerodromes www.atsb.gov.au/safetywatch/safety-around-aeros.aspx.

In a study conducted by the ATSB, which reviewed occurrences at all non-towered aerodromes over a 6-year period from 2003-2008,[3] researchers found that of the 709 occurrences, 60 were classified as serious incidents, and 6 were accidents. Two of the accidents were runway incursions.

[3] http://www.atsb.gov.au/media/2401920/ar2008044(2).pdf

While aircraft operating at the Redcliffe ALA are not required to have a radio, this incident highlights the importance of employing both unalerted and alerted see-and-avoid principles. Pilots should maintain a vigilant lookout for other aircraft, both airborne and on the ground, and maintain an awareness of other aircraft operating in the area. If an aircraft is fitted with a radio, pilots should broadcast their intentions clearly and communicate with others if they are unsure of their intentions.

General details

Occurrence details

Date and time:	8 September 2013 – 1625 EST	
Occurrence category:	Serious incident	
Primary occurrence type:	Runway incursion	
Location:	Redcliffe Aerodrome, Queensland	
	Latitude: 27° 12.40' S	Longitude: 153° 04.07' E

Aircraft details: VH-BJE

Manufacturer and model:	De Havilland Aircraft DH-82A	
Registration:	VH-BJE	
Serial number:	A17-97	
Type of operation:	Charter	
Persons on board:	Crew – 1	Passengers – 1
Injuries:	Crew – Nil	Passengers – Nil
Damage:	None	

Aircraft details: VH-SEN

Manufacturer and model:	Piper Aircraft Corporation PA-34-200	
Registration:	VH-SEN	
Serial number:	34-7250053	
Type of operation:	Charter	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	None	

Runway incursion between a Cessna 206, VH -LHX and a Cessna 210, VH-HGZ

What happened

On 13 August 2013, the pilot of a Cessna 210 aircraft, registered VH-HGZ (HGZ), was conducting a charter flight from Groote Eylandt to Gove Airport, Northern Territory. Prior to commencing the descent into Gove, the pilot broadcast an inbound call on the common traffic advisory frequency (CTAF).[1] Soon after, the pilot reported broadcasting a call advising he was at 10 NM, inbound, with the intention of joining the base leg of the circuit for runway 31.

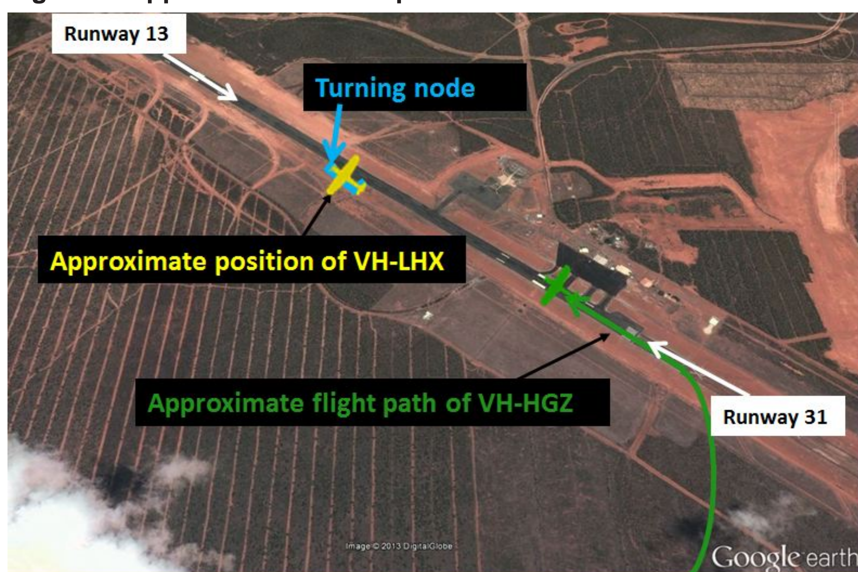
At about the same time, the pilot of a Cessna 206 aircraft, registered VH-LHX (LHX), broadcast on the CTAF advising that he was taxiing at Gove. Shortly after, the pilot broadcast that he was entering and backtracking runway 13. The pilot of LHX elected to use runway 13 as the wind direction was 110° at 7 kt.

The pilot of HGZ joined the base leg for runway 31 and made a broadcast. The pilot stated that he was aware of LHX taxiing.

The pilot of LHX contacted the pilot of HGZ and requested confirmation that he was approaching runway 31. The pilot of HGZ responded that he was at Gove, turning final for runway 31. The pilot of LHX then immediately broadcast that he was on the runway and would be lining up for runway 13. No response was received. The pilot of LHX then broadcast his intention to hold at the turning node, which was located mid-way along the runway, but within the confines of the flight strip (Figure 1). The pilot of HGZ responded and advised that he had LHX sighted and was on final approach for runway 31.

HGZ landed on runway 31 and vacated the runway. At the time, LHX was positioned at the turning node, but the runway was still occupied. LHX subsequently departed from runway 13.

Figure 1: Approximate aircraft positions



Source: Google earth

---

[1] The ATSB obtained recordings of the CTAF transmissions and verified the broadcasts made by the pilots of LHX and HGZ.

Pilot comments (VH-HGZ)

The pilot reported that he did not believe there was a risk of collision with LHX as that aircraft was positioned to the side of the runway. Furthermore, he stated that, in hindsight, he should have joined the circuit at a mid-field crosswind position for runway 31 to ensure adequate separation with LHX.

Pilot comments (VH-LHX)

The pilot of LHX provided the following comments regarding the incident:

- he elected to hold at the turning node to reduce the risk of collision and broadcast his intention to do so
- he was of the impression that the pilot of HGZ was going to continue with his approach as he had broadcast a call stating that he had LHX sighted and was on final.

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

Operator of VH-LHX

As a result of this occurrence, the operator of LHX has advised the ATSB that they are taking the following safety actions:

- A number of pilot communications have been issued to raise awareness of the potential threats of operations around non-towered aerodromes and separation breakdown in uncontrolled airspace in general. These documents emphasise the importance of an effective lookout and the use of correct procedures.
- All pilots will continue to be reminded about the threats related to operations in CTAF areas and technique to minimise a breakdown in separation.

Safety message

The ATSB SafetyWatch highlights the broad safety concerns that come out of our investigation findings and from the occurrence data reported to us by industry. One of the safety concerns is safety around non-towered aerodromes. This report is available on the ATSB website at: www.atsb.gov.au/safetywatch/safety-around-aeros.aspx

An ATSB research report into safety occurrences at non-towered aerodromes determined that runway incursions accounted for about 7 per cent of the 501 conflicts identified between 2003 and 2008. The report further stated that the risk of runway incursions could be minimised by pilots through good communication. The report is available at www.atsb.gov.au/publications/2008/ar_2008_044(1).apsx

This incident highlights the importance of pilots not only being aware of their surroundings and of nearby aircraft, but also the need to maintain sufficient separation.

General details

Occurrence details

Date and time:	13 August 2013 – 1450 CST	
Occurrence category:	Incident	
Primary occurrence type:	Airspace related event	
Location:	Gove Airport, Northern Territory	
	Latitude: 12° 16.17' S	Longitude: 136° 49.10' E

Aircraft details: VH-LHX

Manufacturer and model:	Cessna Aircraft Company 206	
Registration:	VH-LHX	
Serial number:	U20603555	
Type of operation:	Charter - passenger	
Persons on board:	Crew – 1	Passengers – 2
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Aircraft details: VH-HGZ

Manufacturer and model:	Cessna Aircraft Company 210L	
Registration:	VH-HGZ	
Serial number:	21060430	
Type of operation:	Charter - passenger	
Persons on board:	Crew – 1	Passengers – 2
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Total power loss involving a Piper PA 28 140, VH-RVJ

What happened

On 22 September 2013, the pilot of a Piper PA-28-140 aircraft, registered VH-RVJ, was conducting a pre-flight inspection in preparation for a local private flight from the Kilcoy aeroplane landing area (ALA), Queensland with one passenger. During the inspection, the pilot conducted fuel drain checks, with nil contaminants found.

At about 0700 Eastern Standard Time,[1] the pilot taxied the aircraft to the threshold of runway 27 and conducted engine run-ups. The pilot reported that the engine operated as normal. In preparation for take-off, he selected the right fuel tank and turned the fuel pump on.

During the take-off on runway 27, the pilot reported that the engine performed as expected, but at about 50-80 ft above ground level (AGL), the engine suddenly stopped. The pilot immediately confirmed that the fuel tank selection and fuel pump were on. He also noted that the engine revolutions per minute (RPM) indicator was reading zero.

The pilot elected to land ahead on the remaining runway and advised the passenger to brace for impact. The aircraft touched down with about 50 m of runway remaining,[2] but the pilot was unable to brake sufficiently to stop the aircraft prior to the end of the runway.

The aircraft left the end of the runway and collided with a fence, with the left wing striking a strainer post, then continued through a paddock and a ditch before coming to rest after colliding with a second fence.

The aircraft sustained substantial damage (Figure 1) but the pilot and passenger did not receive any injuries.

Figure 1: Damage to VH-RVJ

Source: Aircraft owner

Pilot comments

The pilot provided the following comments regarding the incident:

- A routine 50 hourly inspection of the aircraft was completed 2 weeks prior to the accident.
- An engineer conducted an inspection of the aircraft 4 days after the accident and was able to start the engine.
- There was evidence on the exhaust pipe that the fuel mixture had been running rich.

---

[1] Eastern Standard Time (EST) was Coordinated Universal Time (UTC) + 10 hours.
[2] Runway 09/27 was 800 m in length.

- It was unlikely to have been a magneto problem as the engine had two magnetos and the likelihood of both failing simultaneously to cause a complete engine failure was very low.
- The most likely cause of the engine failure was a carburettor problem.
- He had conducted practice engine failures and emergency procedures during his training and biannual flight reviews and believed that this assisted him in responding promptly to the situation.

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

Aerodrome safety officer

As a result of this occurrence, the aerodrome safety officer has advised the ATSB that they are taking the following safety actions:

Earthworks

The fence posts located beyond the runway are to be painted white, with a white belt hung from the fence to improve its visibility. Earthworks will be carried out to re-profile the paddock and an earth bridge will be constructed over the ditch to provide a safe overrun area. At the time of writing this report, the construction works were still subject to final approval from the leaseholder.

Safety message

This accident highlights the importance of remaining proficient in emergency procedures. Having a plan prior to an emergency situation may mitigate some of the effects of decision making under stress. Knowing that you have a plan under non-stressful and controlled conditions should give you the confidence to carry out the required actions in an emergency situation.

The ATSB 'Avoidable Accidents' booklet, titled *Managing partial power loss after take-off in single-engine aircraft,* focuses on the issues relating to managing a partial power loss after take-off in single-engine aircraft. The key messages highlighted in the booklet are equally applicable to a total engine failure after take-off. It highlights that, accidents resulting from a power loss after take-off can be prevented or significantly minimised by using the following strategies:

- pre-flight decision making and planning for emergencies and abnormal situations for the particular aerodrome
- conducting a thorough pre-flight and engine ground run to reduce the risk of a power loss occurring
- taking positive action and maintaining aircraft control either when turning back to the aerodrome or conducting a forced landing until on the ground, while being aware of flare energy and aircraft stall speeds.

The report is available at www.atsb.gov.au/publications/2010/avoidable-3-ar-2010-055.aspx.

General details

Occurrence details

Date and time:	22 September 2013 – 0700 EST	
Occurrence category:	Accident	
Primary occurrence type:	Total power loss	
Location:	Kilcoy (ALA), Queensland	
	Latitude: 26° 58.27' S	Longitude: 152° 33.92' E

Aircraft details

Manufacturer and model:	Piper Aircraft Corporation PA-28-140	
Registration:	VH-RVJ	
Serial number:	28-7425175	
Type of operation:	Private	
Persons on board:	Crew – 1	Passengers – 1
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Substantial	

Helicopters

Partial power loss involving a Bell 47G, VH-RTO

What happened

On 15 August 2013, at about 1030 Eastern Standard Time,[1] the pilot of a Bell 47G helicopter, registered VH-RTO, departed Essendon, Victoria on a return private flight.

At about 1130, when returning to Essendon, the pilot was instructed by air traffic control (ATC) to conduct one orbit due to traffic in the area. After completing the orbit, ATC instructed the pilot to conduct a second orbit.

While maintaining 1,400 ft above mean sea level (AMSL), the second orbit was commenced. Shortly after, the helicopter began to vibrate severely, yaw from side to side in an oscillating motion, and the rotor revolutions per minute (RRPM) decreased. In response, the pilot lowered the collective[2] in attempt to increase the RRPM, rolled on throttle, and manipulated the anti-torque pedals to counteract the yaw. However, the intensity of the vibrations increased and the oscillating yaw continued. The pilot also reported that the helicopter's engine was 'coughing' and 'spluttering'.

The pilot stated that the helicopter's engine appeared to be losing and then regaining power, and that the resultant change in torque was causing the yaw. The vibrations also increased when throttle was rolled on.

The pilot continued to manipulate the controls; however, as the helicopter was unable to maintain altitude and RRPM, he elected to conduct an autorotation. The pilot lowered the collective and rolled off throttle; the vibrations reduced, but the yaw continued. He then observed a park ('Merri Park') to his left, which was suitable for landing (Figure 1). The pilot broadcast a 'MAYDAY'[3] call, which was acknowledged by ATC.

Figure 1: Location of 'Merri Park'

Source: Google earth

---

[1] Eastern Standard Time (EST) was Coordinated Universal Time (UTC) + 10 hours.

[2] A primary helicopter flight control that simultaneously affects the pitch of all blades of a lifting rotor. Collective input is the main control for vertical velocity.

[3] Mayday is an internationally recognised radio call for urgent assistance.

About 20-30 seconds after the vibrations and yaw commenced, with some power remaining, the helicopter landed in the park with nil injuries or damage sustained. After landing, the pilot reported that the engine ran relatively smooth when at idle. He shut down the helicopter and exited.

The pilot was later advised by witnesses that the sound of the helicopter did not appear normal and white 'puffs' of smoke were observed emanating from the exhaust system.

Engineering inspection

An engineering inspection identified that a spring in the distributor block of the left magneto was missing (Figure 2), which resulted in cross firing in the distributor and an associated loss of power. A new spring was fitted and the left magneto tested, with nil faults found. It could not be determined when or how the spring went missing.

Figure 2: Left magneto distributor block

Source: Maintenance provider

Pilot comment

The pilot reported that landing immediately with some power remaining and when a suitable landing area was available, was a more favourable situation than attempting to extend the flight further. The pilot also stated that he later spoke to a helicopter licensed aircraft maintenance engineer (LAME), who indicated that the situation could have deteriorated and a total power loss may have occurred.

Safety message

A partial engine power loss presents a more complex situation to the pilot than a complete power loss. Pilots have been trained to respond to a complete power loss, and the limited time within which to respond is continually emphasised throughout training in an attempt to make it second nature. However, pilots are not generally trained to deal with a partial power loss. Following a complete engine failure, a forced landing or autorotation is inevitable, but for a partial power loss, pilots are faced with making the difficult decision of whether to continue flight or to land immediately.[4] This incident highlights the importance of making timely decisions when a situation develops and the benefits of landing as soon as possible, before the situation deteriorates further.

[4] http://www.atsb.gov.au/publications/2010/avoidable-3-ar-2010-055.aspx

General details

Occurrence details

Date and time:	15 August 2013 – 1139 EST	
Occurrence category:	Serious incident	
Primary occurrence type:	Partial power loss	
Location:	9 km SE of Essendon Airport, Victoria	
	Latitude: 37° 46.336’ S	Longitude: 144° 59.179’ E

Helicopter details

Manufacturer and model:	Bell Helicopter Company 47G-5A	
Registration:	VH-RTO	
Serial number:	25052	
Type of operation:	Private	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Aircraft proximity event between a Cessna 172, VH-RQZ and an Agusta AW139, VH-ESZ

What happened

On 26 August 2013, a flight instructor and student pilot were conducting night circuits in a Cessna 172 aircraft, registered VH-RQZ (RQZ), at Archerfield Airport, Queensland.[1] At the time, there were two other aircraft conducting night circuits and an aircraft operating under the instrument flight rules (IFR) inbound to Archerfield from the west. Common traffic advisory frequency (CTAF) procedures were in place at the time.

At about 1845 Eastern Standard Time,[2] an IFR-operated Agusta AW139 helicopter, registered VH-ESZ (ESZ), departed the Royal Brisbane Hospital on a 4 minute flight to Archerfield. On board the helicopter were three crew members: the pilot in command in the front right seat, the aircrew officer in the front left seat, and the rescue officer in the back.

When 5.5 NM north of Archerfield, the pilot of ESZ was instructed by Brisbane air traffic control (ATC) to change to the CTAF and was advised of an IFR aircraft inbound to Archerfield and that there were multiple aircraft in the circuit.

At about 1851, the student pilot of RQZ broadcast on the CTAF that he was on the downwind leg of the circuit for runway 10. The pilot of the IFR aircraft replied that they would follow RQZ in the circuit. The pilot of ESZ then broadcast an inbound call advising that they were 5 NM to the north of Archerfield at 1,400 ft above mean sea level (AMSL). The pilot of the IFR aircraft responded, stating that they were joining crosswind for runway 10.

The pilot of ESZ then communicated with the pilot of the IFR aircraft and advised that they were descending through 900 ft and would be conducting a tight left base for runway 10. The pilot of ESZ reported that he received a traffic collision avoidance system (TCAS)[3] traffic advisory (TA)[4] on the IFR aircraft. He also reported sighting two other aircraft in the circuit and noted that they were unlikely to come into conflict with ESZ.

The student pilot of RQZ then broadcast that they were turning base for a touch-and-go on runway 10 and were conducting a simulated landing light failure.

About 15 seconds later, the pilot of the IFR aircraft asked the pilot of RQZ to confirm his position, to which the instructor replied that they were turning onto final. Shortly after, the pilot of ESZ broadcast that he was on a tight left base for runway 10.

When RQZ was on final approach to runway 10, the instructor sighted ESZ on a close base in his 10 o'clock[5] position, about 1 NM (1850 m) away. The instructor of RQZ then broadcast asking the

---

1 Archerfield Tower provides air traffic services within Class D airspace during tower hours. Outside tower hours the airspace becomes Class G and common traffic advisory frequency (CTAF) procedures apply.

2 Eastern Standard Time (EST) was Coordinated Universal Time (UTC) + 10 hours.

3 Traffic collision avoidance system (TCAS) is an aircraft collision avoidance system. It monitors the airspace around an aircraft for other aircraft equipped with a corresponding active transponder and gives warning of possible collision risks.

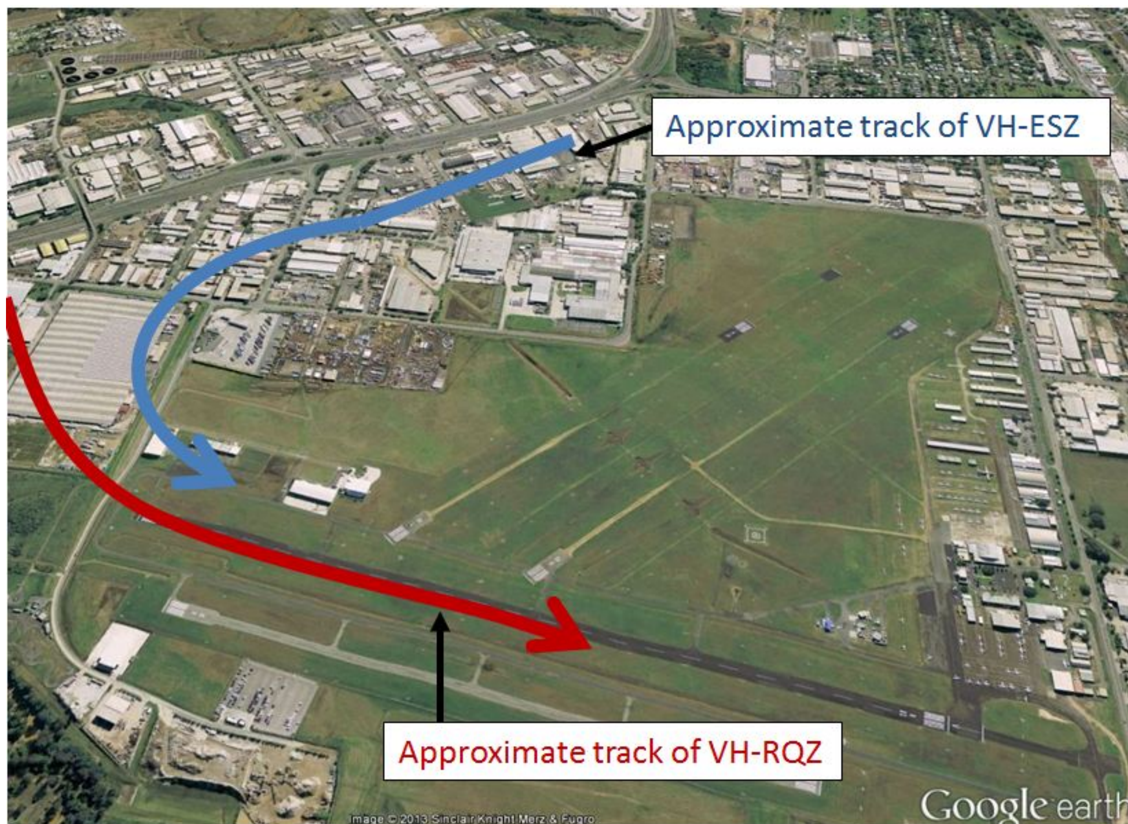
4 Traffic collision avoidance system traffic advisory, when a TA is issued, pilots are instructed to initiate a visual search for the traffic causing the TA.

5 The clock code is used to denote the direction of an aircraft or surface feature relative to the current heading of the observer's aircraft, expressed in terms of position on an analogue clock face. Twelve o'clock is ahead while an aircraft observed abeam to the left would be said to be at 9 o'clock.

pilot of ESZ whether he had RQZ ('the aircraft on final') sighted, but did not hear any response. The instructor of RQZ reported that they were then about 300-500 m away from ESZ and about 50 ft below. The instructor took control of the aircraft and initiated a go-around. He manoeuvred the aircraft about 50 m to the right of the runway centreline to ensure separation with ESZ.

When at about 300 ft above ground level (AGL), the pilot of ESZ scanned for aircraft prior to turning onto final. He then sighted RQZ in his 4 o'clock position, about 100 ft below and 100 m behind ESZ and reported that RQZ appeared to have commenced a turn. The instructor of RQZ then broadcast that they were going around. The pilot of ESZ tightened the turn onto final and elected to land on the taxiway parallel to runway 10 (Figure 1). He had not received a TCAS alert on any aircraft other than the IFR aircraft, which was on downwind. The pilot of RQZ reported that they had their transponder turned on and it was operational at the time.

Figure 1: Approximate aircraft tracks



Source: Google earth and pilot recollections

The operator of ESZ had a company policy regarding alerted see-and-avoid, specifically, that the aircrew officer was responsible for assisting the pilot with listening, recording and monitoring the traffic situation. The pilot reported that none of the crew members heard any calls from RQZ or sighted the aircraft prior to the turn onto final.

Pilot comments (VH-ESZ)

The pilot of ESZ provided the following comments regarding the incident:

- he did not hear any broadcasts from the pilot of RQZ[6]
- the helicopter had a search light, landing light, position lights and a strobe on at the time
- the aircrew officer reported observing RQZ conduct a subsequent landing without the landing light on.

Pilot comments (VH-RQZ)

The instructor reported that, at the time, RQZ had strobe, beacon and navigation lights on, but they were conducting a simulated landing light failure, which he had advised as part of his turning base broadcast on the CTAF. In addition, he heard the inbound broadcast from ESZ and subsequent communications with the pilot of the IFR aircraft.

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

Operator of VH-ESZ

As a result of this occurrence, the aircraft operator has advised the ATSB that they have taken the following safety actions:

- recommendations have been put forward to Airservices Australia to update the En Route Supplement Australia (ERSA) to include information regarding emergency service operations at Archerfield Airport
- a briefing discussing airspace operations at Archerfield Airport was provided to aircrews.

In addition, the operator has recommended that information depicting the departure and arrival patterns of their helicopters from the local hospitals be included in the Archerfield Airport Newsletter.

Airservices Australia

As a result of this occurrence, Airservices Australia has advised the ATSB that they are willing to assist with the addition of information in the ERSA regarding emergency service operations at Archerfield Airport.

Safety message

The ATSB SafetyWatch highlights the broad safety concerns that come out of our investigation findings and from the occurrence data reported to us by industry. One of the safety concerns is safety around non-towered aerodromes www.atsb.gov.au/safetywatch/safety-around-aeros.aspx.

Research conducted by the ATSB found that, between 2003 and 2008, 181 occurrences of reduced separation were reported, of which 55 were near mid-air collisions (aircraft proximity events). Insufficient communication between pilots and breakdowns in situational awareness were the most common contributors to safety incidents in the vicinity of non-towered aerodromes.

A review by the ATSB of mid-air collisions between 1961 and 2003 also found that almost 80 per cent of mid-air collisions (29 accidents) occurred in or near the circuit area, with two-thirds of these involving aircraft on final approach or the base-to-final turn.

[6] The ATSB obtained recordings of the CTAF transmissions and all broadcasts made by the pilots of RQZ and ESZ were recorded.

A pilot's guide to staying safety in the vicinity of non-towered aerodromes is available at www.atsb.gov.au/publications/2008/ar-2008-044(1).aspx.

This incident highlights the importance of using both unalerted and alerted see-and-avoid principles and maintaining a vigilant lookout at all times. It also emphasis the benefits of transponders, which can assist pilots of TCAS equipped aircraft with their awareness of other traffic.

The Civil Aviation Safety Authority Civil Aviation Advisory Publication (CAAP) 166-1(1) states that:

> *Transponders can be detected by aircraft equipped with ACAS (TCAS), allowing them to 'see' other aircraft and take evasive action. Pilots of transponder-equipped aircraft should at all times ensure their transponder is switched to ON/ALT (Mode C), including when operating in the vicinity of a non-towered aerodrome.*

A copy of the CAAP 166-1(1) is available at:
www.casa.gov.au/wcmswr/_assets/main/download/caaps/ops/166-1.pdf

General details

Occurrence details

Date and time:	26 August 2013 – 1845 EST	
Occurrence category:	Serious incident	
Primary occurrence type:	Airprox	
Location:	Archerfield Airport, Queensland	
	Latitude: 27° 34.22' S	Longitude: 153° 00.48' E

Aircraft details: VH-RQZ

Manufacturer and model:	Cessna Aircraft Company	
Registration:	VH-RQZ	
Serial number:	17280980	
Type of operation:	Flying training – dual	
Persons on board:	Crew – 2	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Aircraft details: VH-ESZ

Manufacturer and model:	Agusta, Spa, Construzioni Aeronautiche, AW139	
Registration:	VH-ESZ	
Serial number:	31125	
Type of operation:	Aerial work	
Persons on board:	Crew – 3	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Aircraft configuration event involving a Robinson R22, VH-ONT

What happened

On 13 September 2013, the flight instructor and student pilot of a Robinson R22 helicopter, registered VH-ONT, were preparing for a dual training flight from Armidale, New South Wales.

The instructor conducted a pre-flight briefing with the student and revised effects of controls, straight-and-level flight, climbing, descending, and turning.

Prior to take-off, the instructor explained the purpose of the fuel mixture control guard,[1] the use of the carburettor heat, and took the student through the start-up checklist.[2]

At about 1515 Eastern Standard Time,[3] the helicopter departed, with the instructor operating the controls. During the climb, at about 300 ft above ground level (AGL), the instructor handed control of the helicopter over to the student. The instructor monitored the student's control inputs and asked the student to talk through his actions prior to performing them.

When maintaining 1,200 ft AGL, the instructor discussed with the student how to enter a descent. After confirming that they would reduce the engine power, the instructor asked the student to pull the carburettor heat on. The instructor looked outside to check for traffic and the engine then stopped. The instructor immediately initiated an autorotation[4] and lowered the collective.[5] He then looked around the cyclic[6] control and observed that the fuel mixture control was in the idle cut-off position. The student had removed the fuel mixture control guard, inadvertently pulled the fuel mixture control instead of the carburettor heat control and then replaced the guard. The instructor asked the student to push the fuel mixture control back in and he broadcast a 'MAYDAY'[7] call on the common traffic advisory frequency (CTAF).

The instructor reported that, due to the lack of height available, he elected not to attempt an engine restart. He selected a paddock and focused on the autorotation. Prior to the landing flare,[8] the low rotor revolutions per minute (RRPM) horn sounded. The instructor held the flare and used the helicopter's tail to absorb the impact with the ground. The helicopter landed and ran on the ground on its skids, before rolling onto its side due to the slope of the paddock. Both occupants sustained minor injuries and the helicopter was substantially damaged (Figure 1).

---

[1] The fuel control mixture guard was a plastic piece of pipe that sat around the fuel mixture control to prevent inadvertent operation of the control.

[2] The fuel mixture and carburettor heat controls were positioned on the right side of the cyclic, on the lower centre pedestal near the student's leg. The fuel mixture control was positioned in front of, and about 20 cm, from the carburettor heat control.

[3] Eastern Standard Time (EST) was Coordinated Universal Time (UTC) + 10 hours.

[4] Autorotation is a condition of descending flight where, following engine failure or deliberate disengagement, the rotor blades are driven solely by aerodynamic forces resulting from rate of descent airflow through the rotor. The rate of descent is determined mainly by airspeed.

[5] A primary helicopter flight control that simultaneously affects the pitch of all blades of a lifting rotor. Collective input is the main control for vertical velocity.

[6] A primary helicopter flight control that is similar to an aircraft control column. Cyclic input tilts the main rotor disc varying the attitude of the helicopter and hence the lateral direction.

[7] Mayday is an internationally recognised radio call for urgent assistance.

[8] Flare is aimed to reduce rate of descent before ground impact by increasing collective pitch; this increases lift, trading stored rotor kinetic energy for increased aerodynamic reaction by blades, and should result in a gentle touchdown.

Figure 1: Damage to VH-ONT

Source: Operator

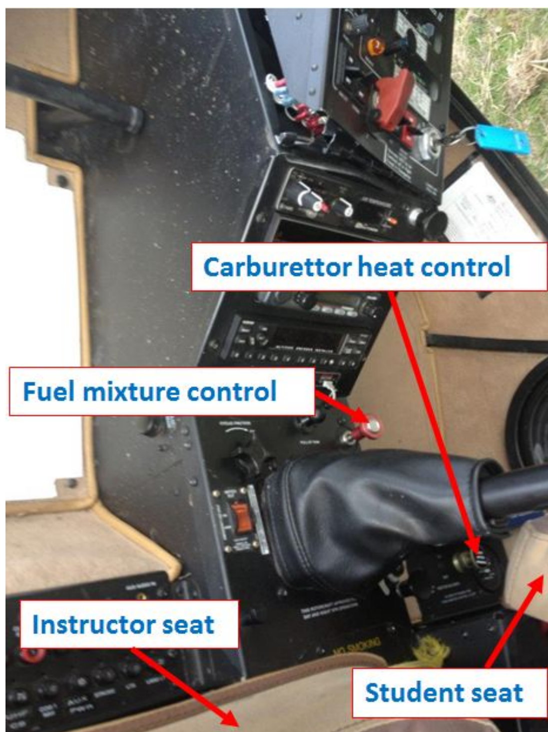
Pilot experience

The pilot held a Student Pilot Licence, with about 6.6 hours total time, all of which were on the R22. The student had not flown in the 18 months prior to the accident.

Pilot comments (instructor)

The instructor reported that he could not see the fuel mixture and carburettor heat controls from his normal seated position on the left side of the helicopter as the controls were obscured by the cyclic (Figure 2). He believed that he had observed the student reach down (toward the carburettor heat control) not forward (toward to fuel mixture control), prior to looking outside to check for traffic.

Figure 2: Location of the controls in VH-ONT



Source: Operator

Pilot comments (student)

The student pilot provided the following comments regarding the accident:

- he had inadvertently pulled the fuel mixture control instead of the carburettor heat
- he had not previously used the carburettor heat control
- the fuel mixture control was positioned forward of the carburettor heat control
- given his low amount of flying hours, he suggested that he should have confirmed where the carburettor heat control was, before pulling it out.

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

Helicopter operator

As a result of this occurrence, the helicopter operator has advised the ATSB that they are taking the following safety actions:

- devising a procedure, and determining limits, that do not allow a student to operate the carburettor heat until a certain number of flying hours and recency have been achieved
- placing an increased emphasis on secondary control awareness
- students will be required to verbally confirm 'carby heat identified' prior to pulling the control and then saying 'carby heat off'
- increasing the frequency of emergency procedures training.

Safety message

This accident highlights the benefit of pilots positively identifying the control to be manipulated, prior to performing the action. Robinson Helicopter Company Safety Notice SN-1[9] advises that cases have been reported where a pilot inadvertently pulled the mixture control instead of the carburettor heat control, resulting in sudden and complete engine stoppage. The notice recommends that the mixture control guard and the differences between the controls be emphasised to new pilots. If the mixture control is advertently pulled, the notice advises pilots to lower the collective and enter autorotation, or if there is sufficient altitude, to push the mixture in and restart the engine using the left hand.

General details

Occurrence details

Date and time:	13 September 2013 – 1600 EST	
Occurrence category:	Accident	
Primary occurrence type:	Aircraft configuration event	
Location:	near Armidale Airport, New South Wales	
	Latitude: 30° 31.68' S	Longitude: 151° 37.03' E

9 http://www.robinsonheli.com/rhc_safety_notices.html

Aircraft details

Manufacturer and model:	Robinson Helicopter Company R22	
Registration:	VH-ONT	
Serial number:	4495	
Type of operation:	Flying training - dual	
Persons on board:	Crew – 2	Passengers – Nil
Injuries:	Crew – 2 (Minor)	Passengers – Nil
Damage:	Substantial	

Australian Transport Safety Bureau

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The Bureau is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; fostering safety awareness, knowledge and action.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements.

Purpose of safety investigations

The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the safety factors related to the transport safety matter being investigated. The terms the ATSB uses to refer to key safety and risk concepts are set out in the next section: Terminology Used in this Report.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

About this Bulletin

The ATSB receives around 15,000 notifications of Aviation occurrences each year, 8,000 of which are accidents, serious incidents and incidents. It also receives a lesser number of similar occurrences in the Rail and Marine transport sectors. It is from the information provided in these notifications that the ATSB makes a decision on whether or not to investigate. While some further information is sought in some cases to assist in making those decisions, resource constraints dictate that a significant amount of professional judgement is needed to be exercised.

There are times when more detailed information about the circumstances of the occurrence allows the ATSB to make a more informed decision both about whether to investigate at all and, if so, what necessary resources are required (investigation level). In addition, further publically available information on accidents and serious incidents increases safety awareness in the industry and enables improved research activities and analysis of safety trends, leading to more targeted safety education.

The Short Investigation Team gathers additional factual information on aviation accidents and serious incidents (with the exception of 'high risk operations), and similar Rail and Marine occurrences, where the initial decision has been not to commence a 'full' (level 1 to 4) investigation.

The primary objective of the team is to undertake limited-scope, fact gathering investigations, which result in a short summary report. The summary report is a compilation of the information the ATSB has gathered, sourced from individuals or organisations involved in the occurrences, on the circumstances surrounding the occurrence and what safety action may have been taken or identified as a result of the occurrence.

These reports are released publically. In the aviation transport context, the reports are released periodically in a Bulletin format.

Conducting these Short investigations has a number of benefits:

- Publication of the circumstances surrounding a larger number of occurrences enables greater industry awareness of potential safety issues and possible safety action.
- The additional information gathered results in a richer source of information for research and statistical analysis purposes that can be used both by ATSB research staff as well as other stakeholders, including the portfolio agencies and research institutions.
- Reviewing the additional information serves as a screening process to allow decisions to be made about whether a full investigation is warranted. This addresses the issue of 'not knowing what we don't know' and ensures that the ATSB does not miss opportunities to identify safety issues and facilitate safety action.
- In cases where the initial decision was to conduct a full investigation, but which, after the preliminary evidence collection and review phase, later suggested that further resources are not warranted, the investigation may be finalised with a short factual report.
- It assists Australia to more fully comply with its obligations under ICAO Annex 13 to investigate all aviation accidents and serious incidents.
- Publicises ***Safety Messages*** aimed at improving awareness of issues and good safety practices to both the transport industries and the travelling public.

Australian Transport Safety Bureau

24 Hours 1800 020 616
Web www.atsb.gov.au
Twitter @ATSBinfo
Email atsbinfo@atsb.gov.au

Investigation

ATSB Transport Safety Report
Aviation Short Investigations
Aviation Short Investigation Bulletin Issue 24

AB-2013-202
Final – 10 December 2013