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Fumes event involving an Airbus A330, VH-XFB

What happened

At around midday on 9 June 2014, an Airbus A330, registered VH-XFB, operated by Virgin Australia, took off from Perth, Western Australia, on a scheduled passenger service, bound for Sydney, New South Wales. As engine power was applied at the commencement of take-off, the cabin crew members at the rear of the cabin noticed a burning odour. Based upon their experience on this particular aircraft, the cabin crew initially dismissed the fumes as being relatively common. The crew had experienced similar fumes on previous occasions, noting that they usually dissipated soon after take-off. On this occasion however, the crew noted that the fumes seemed more intense than usual, and appeared to grow in intensity as the departure continued.

Concerned about the growing intensity of the fumes, the cabin crew contacted the cabin supervisor, who was seated further forward during the take-off. When the cabin crew were released from their seats by the flight crew, the cabin supervisor came back to assist with identification of the source of the fumes. Some cabin crew further forward also noticed the odour, but to a lesser extent than the crew at the rear of the aircraft. The cabin crew turned off the fridges in the rear galley, believing that a fridge malfunction may be the source of the fumes, but that action had no effect. Upon further investigation, the crew then traced the source of the fumes to a vent in the rear cabin bulkhead.

The cabin crew moved away from the area and monitored the intensity of the fumes, which continued for about 20 minutes before dissipating. The captain was briefed by the cabin supervisor and came to the rear of the cabin to assess the situation, but by that time the fumes had dissipated. The captain indicated to the cabin crew that there had been no flight deck indications to suggest that there was a problem.

Some cabin crew members were adversely affected by the fumes and were unable to complete their normal in-flight duties. The flight crew considered diverting to Adelaide but elected to continue to Sydney given that the most affected crew members had been administered oxygen and were recovering from their exposure to the fumes. Some cabin crew members also sought medical attention following the flight. At the completion of the flight, the captain made a maintenance log entry indicating that acrid fumes were evident in the rear galley area after take-off.

Subsequent engineering investigation

Following the flight, a subsequent engineering inspection found that a portion of insulation blanket fitted to the rear pressure bulkhead of the aircraft had collapsed and came into contact with the Auxiliary Power Unit (APU)[1] bleed air duct, where the duct passes through the rear pressure bulkhead. The engineering investigation determined that the insulation blanket had not been correctly refitted following maintenance by a previous operator of the aircraft.

The insulation blanket is constructed of glass wool encased in a wrapping material. The wrapping was damaged and heat affected where the insulation blanket was in contact with the APU bleed air duct. Damage to the wrapping exposed the inner glass wool material, which also showed evidence of having been affected by heat where the material was in contact with the bleed air duct

[1] The APU is a self-contained unit at the rear of the aircraft that provides a source of air-conditioning and electrical power when required. During this incident, the APU was shut down by the flight crew soon after push-back from the gate, which is normal practice.

(Figures 1 and 2). Engineering staff determined that the insulation blanket in contact with the bleed air duct was the likely source of the fumes.

Figure 1: Insulation blanket damage adjacent to upper surface of APU bleed air duct

Source: Aircraft operator (image cropped by ATSB)

Figure 2: Insulation blanket damage adjacent to lower surface of APU bleed air duct

Source: Aircraft operator (image cropped by ATSB)

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.

Aircraft operator

The operator found similar damage on another A330 aircraft, registered VH-XFA. As an interim measure, the operator prohibited use of the APU on both VH-XFB and VH-XFA. Both aircraft were then subject to an Engineering Order which required that a section of the insulation blanket adjacent to the APU bleed air ducting to be trimmed and sealed, and that the remainder of the blanket be appropriately restrained. The Engineering Order also required a detailed visual inspection of the rear pressure bulkhead structure immediately around the bleed air duct (looking for signs of heat damage, paint discolouration or distortion). The second part of the Engineering Order directed that the insulation blanked be replaced entirely, as a permanent repair.

Aircraft manufacturer

In response to the information provided by the operator, the aircraft manufacturer recommended the following inspections:

- Inspection of a flexible union in the APU bleed duct in the area near the rear pressure bulkhead for evidence of a bleed air leak.
- A heat damage evaluation, including the assessment of any effect on primary structure (using electrical conductivity testing) in the affected area and an inspection of floor panels above the damaged blanket.
- Visual inspection of surface protection (water repellent agent) in the affected area.

The manufacturer also sought to have the damaged insulation blanket shipped to the blanket manufacturer in order to better understand the origin of the damage (this was not possible because the damaged insulation blanket had been discarded when it was replaced).

Safety message

Fumes can originate from a wide range of sources. While some fumes may appear subtle and innocuous, they may be the first indication of a more serious problem. Furthermore, the effect of fumes on the human body is dependent on many variables, including the nature and intensity of the fumes, and the duration of exposure. This incident serves to highlight the importance of treating all fumes with suspicion, and implementing a cautious and conservative response, consistent with published guidance.

In 2011, the FAA released an Information for Operators (InFO) notice dealing with smoke and/or fumes in transport category aircraft (number 11002). This notice was issued to inform operators of the need for 'greater emphasis on finding new ways to identify areas susceptible to smoke or may become susceptible to smoke'. The notice commented that 'approximately 900 smoke or fumes in the cockpit or cabin events occur annually in transport category airplanes'. The notice recommends that operators record and track smoke and/or fumes related events and use this data to definitively resolve and thereby reduce incidents of smoke and/or fumes entering aircraft. A copy of InFO notice 11002 can be found on the FAA website via the following link: www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/info/

The ATSB recently released a research report (AR-2013-213) titled *An analysis of fumes and smoke events in Australian aviation* (www.atsb.gov.au/publications/2014/ar-2013-213.aspx). The study was undertaken to further understanding of the nature and impact of aviation fumes and smoke related occurrences in Australia. Research associated with that report found that:

> *The most common source of fumes/smoke was aircraft systems issues, primarily relating to failure or malfunction of electrical and auxiliary power unit (APU) systems. Equipment and furnishings also featured highly as a source of fumes and smoke. Within this category, air conditioning and galley equipment were the most common sources of fumes/smoke. External sources of fumes/smoke and cargo/baggage related events were relatively rare.*

General details

Occurrence details

Date and time:	09 June 2014 – 1143 WST	
Occurrence category:	Incident	
Primary occurrence type:	Fumes	
Location:	Near Perth, Western Australia	
	Latitude: 31° 56.42' S	Longitude: 115° 58.02' E

Aircraft details

Manufacturer and model:	Airbus	
Registration:	VH-XFB	
Operator:	Virgin Australia	
Serial number:	0372	
Type of operation:	Air Transport	
Persons on board:	Crew – 11	Passengers – Unknown
Injuries:	Crew – 4	Passengers – Nil reported
Damage:	Minor	

Piston aircraft

Engine failure involving a Beech Aircraft Corp D17-S, VH-FNS

What happened

On 31 May 2014 at about 1322 Western Standard Time, a Beech Aircraft Corp D17-S, registered VH-FNS (FNS), was being used to conduct a private flight from Crooked Brook landing area to Geraldton airport, Western Australia. The flight was conducted in visual meteorological conditions and the pilot was the only person on board.

After departure, the pilot tracked FNS in a northerly direction and climbed to an altitude of about 2,500 feet above mean sea level (AMSL). About a minute after setting the engine to cruise power, the pilot felt a violent vibration with an associated decrease in engine power. The pilot described the engine as 'surging' and 'back-firing'. The pilot conducted initial troubleshooting and was unable to identify a reason for the engine malfunction. The vibration ceased and the engine was no longer producing power but the propeller was windmilling. The pilot elected to leave the landing gear retracted and set up a glide approach tracking to the north-east to locate a more suitable landing area to conduct a forced landing. A suitable paddock was identified that was near a house. The aircraft flew over a line of tall trees and then clipped a fence that was next to a private road leading to the house, went through a second fence on the other side of the road, which partially arrested the aircraft. It then impacted a large log and came to rest (Figure 1). A passer-by assisted the pilot to evacuate the aircraft. The pilot was seriously injured and transported to hospital and the aircraft was substantially damaged.

Figure 1: Accident site

Source: Aircraft owner

Pilot comment

The pilot reported that he had conducted a pre-takeoff brief covering the actions and considerations in relation to an engine failure. The pilot also indicated that he had flight planned to cruise at an altitude of 4,500 feet AMSL but amended this to 2,500 feet AMSL due to the increase in wind speed at altitude.

The pilot reported that the engine was subsequently examined and that a hole was located in the number five cylinder wall (Figure 2). Extensive internal damage was found and the reason for the internal engine failure could not be determined. The pilot indicated that the engine had failed at about 223 hours since it was last overhauled and that the specified time between engine overhauls was 1,000 hours.

Figure 2: External view of damage to number five cylinder

Source: Aircraft owner

Safety message

Pilots should consider the effect an in-flight engine failure at different altitudes has on the time available to manage that failure and identify a suitable forced landing area. In this instance the pilot had enough time to manoeuvre towards a different area.

The ATSB booklet Avoidable Accidents No. 3 - Managing partial power loss after take-off in single-engine aircraft (available at www.atsb.gov.au/publications/2010/avoidable-3-ar-2010-055.aspx) contains information that is also relevant to a complete engine power loss.

The booklet highlights the importance of:

- pre-flight decision making and planning for emergencies and abnormal situations for the particular aerodrome including a thorough pre-flight self-brief covering the different emergency scenarios.

- conducting a thorough pre-flight and engine ground run to identify any issues that may lead to an engine failure.
- 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.

General details

Occurrence details

Date and time:	31 May 2014 – 1330 WST	
Occurrence category:	Accident	
Primary occurrence type:	Engine failure	
Location:	12 km ESE of Bunbury Airport, Western Australia	
	Latitude: 33° 24.12' S	Longitude: 115° 48.15' E

Aircraft details

Manufacturer and model:	Beech Aircraft Corp D17-S	
Registration:	VH-FNS	
Serial number:	3108	
Type of operation:	Private	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – 1	Passengers – Nil
Damage:	Substantial	

Near collision involving a Grob G115, VH-BBJ and a Grob G115, VH-ZIM

What happened

On 21 May 2014, a Grob G115, registered VH-BBJ (BBJ) and a Grob G115, registered VH-ZIM (ZIM) (Figure 1) were both conducting dual flight training in the northern training area, near Merredin aeroplane landing area (ALA), Western Australia. BBJ and ZIM each had a flight instructor and a student pilot on board. The flights were conducted in visual meteorological conditions.

Figure 1: Grob G115 VH-BBJ

Source: David Eyre

Grob G115 VH-ZIM

Neville Murphy

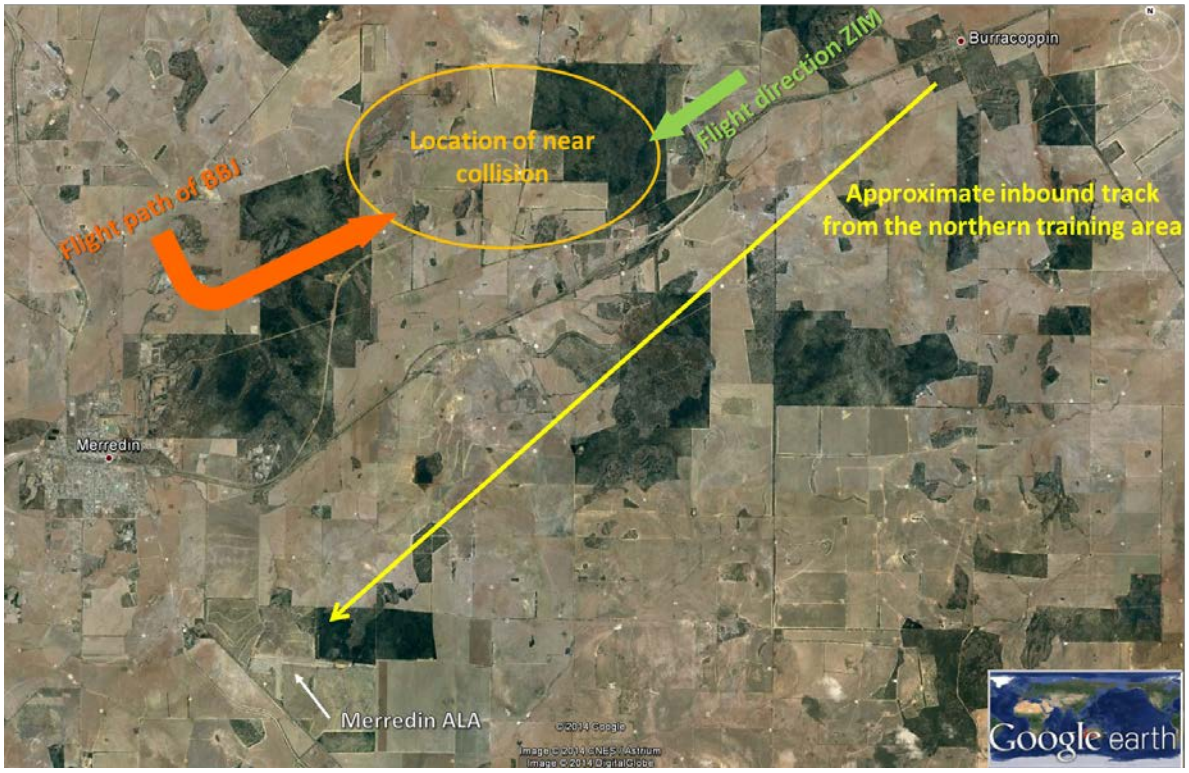
The student pilot of ZIM was conducting a pre-licence general flying progress test (GFPT). After completion of the training area component of the test in the northern training area, the student pilot navigated to the Merredin inbound reporting point near Burracoppin, at an altitude of about 3,500 feet above mean sea level (AMSL). The student broadcast on the common traffic advisory frequency (CTAF) the inbound call to Merredin ALA (Figure 2). During the flight, the student became disorientated and tracked toward the town of Merredin, instead of Merredin ALA. The student was not able to located Merredin ALA and the instructor provided assistance by pointing out land features.

At about the same time, the instructor of BBJ had just completed basic instrument flying with the student in the northern training area. The student tracked to the south-east, toward Burracoppin at 3,500 feet AMSL. The aircraft remained clear of the inbound track from Burracoppin to Merredin ALA. The instructor broadcast their intentions on the CTAF.

As ZIM turned to navigate toward Merredin ALA, the instructor observed BBJ, which appeared to take up almost the entire windscreen. She took control of the aircraft and took evasive action, by pushing the control column forward and descending. At about the same time, the instructor of BBJ observed ZIM straight ahead, at or just below the horizon coming towards them and took control of the aircraft from the student to take evasive action, pulling the control column rearward and climbing.

Both aircraft returned to Merredin without further incident. The pilots of both aircraft were uninjured and neither aircraft was damaged.

Figure 2: Approximate location of near collision



Source: Google earth

Instructor comment BBJ

The instructor of BBJ reported hearing the broadcast on the CTAF made by ZIM at the inbound reporting point to Merredin ALA.

The instructor indicated that although the exact location of ZIM was not known prior to the incident, they were clear of the inbound track, and therefore assumed they were clear of any possible conflict.

The instructor reported that, at the time of the incident, he was instructing the student and this may have reduced the ability to see ZIM earlier.

The first thing that drew the instructor's attention to ZIM was that it was getting larger, it did not appear to be moving. The instructor indicated that the distance between the two aircraft was very close (less than 20 meters) and if they had banked away from each other, instead of changing altitude, they may have collided.

The instructor indicated that there was nothing that affected visibility.

Instructor comment ZIM

The instructor of ZIM reported that, at the time of the incident, she was instructing the student on identifying features to navigate to Merredin ALA, and this may have reduced the ability to see BBJ earlier.

The instructor estimated that they had come within about 10 feet of BBJ. The instructor indicated that when first sighted, BBJ took up almost the whole windscreen. It was traveling in the opposite direction and appeared to be at the same level as they were.

The instructor indicated that there was nothing that affected visibility.

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 not been advised of any proactive safety action in response to this occurrence.

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.

This serious incident highlights that it is difficult for pilots to sight another aircraft through visual observation alone. The ATSB often receives reports from pilots that another aircraft is flying too close to them in uncontrolled airspace. About three quarters of these reports involve pilots flying within 10 nautical miles (18.5 km) of a non-controlled aerodrome.

Insufficient communication between pilots operating in the same area is the most common cause of safety incidents near non-controlled aerodromes.

SafetyWatch highlights the importance of:

- Getting a radio, and always make sufficient broadcasts so that other pilots know your intentions – even when you think there is no nearby traffic.
- Maintaining a lookout for other aircraft at all times. Do not rely solely on monitoring your radio to achieve traffic awareness.
- Achieving radio alerted see-and-avoid by making all the recommended broadcasts within 10 nautical miles of a non-towered aerodrome. A search for other traffic is eight times more effective when a radio is used in combination with a visual lookout than when no radio is used.
- Using the same procedures at all non-towered aerodromes, unless otherwise stated in the En Route Supplement Australia. Following known, standard traffic procedures helps pilots to anticipate the likely position of other aircraft.

Other relevant resources:

- The ATSB booklet *A pilot's guide to staying safe in the vicinity of non-towered aerodromes* outlines many of the common problems that occur at non-towered aerodromes, and offers useful strategies (available at www.atsb.gov.au/publications/2008/avoidable-1-ar-2008-044(1).aspx).
- The Civil Aviation Safety Authority (CASA) has produced several publications and resources that provide important safety advice for operations at, or in the vicinity of non-controlled aerodromes (available at www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_100058).
- The ATSB publication *Limitations of the See-and-Avoid Principle* available at www.atsb.gov.au/publications/1991/limit_see_avoid.aspx.

General details

Occurrence details

Date and time:	21 May 2014 – 1615 WST	
Occurrence category:	Serious incident	
Primary occurrence type:	Near collision	
Location:	near Merredin (ALA), Western Australia	
	Latitude: 31° 25.30' S	Longitude: 118° 22.32' E

Aircraft details VH-BBJ

Manufacturer and model:	Grob G115	
Registration:	VH-BBJ	
Serial number:	82026/C2	
Type of operation:	Flight training	
Persons on board:	Crew – 2	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	None	

Aircraft details VH-ZIM

Manufacturer and model:	Grob G115	
Registration:	VH-ZIM	
Serial number:	82080/C2	
Type of operation:	Flight training	
Persons on board:	Crew – 2	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	None	

Loss of control involving a Piper Aircraft Corp PA-28-161, VH-TEK

What happened

Piper Aircraft Corp PA-28-161

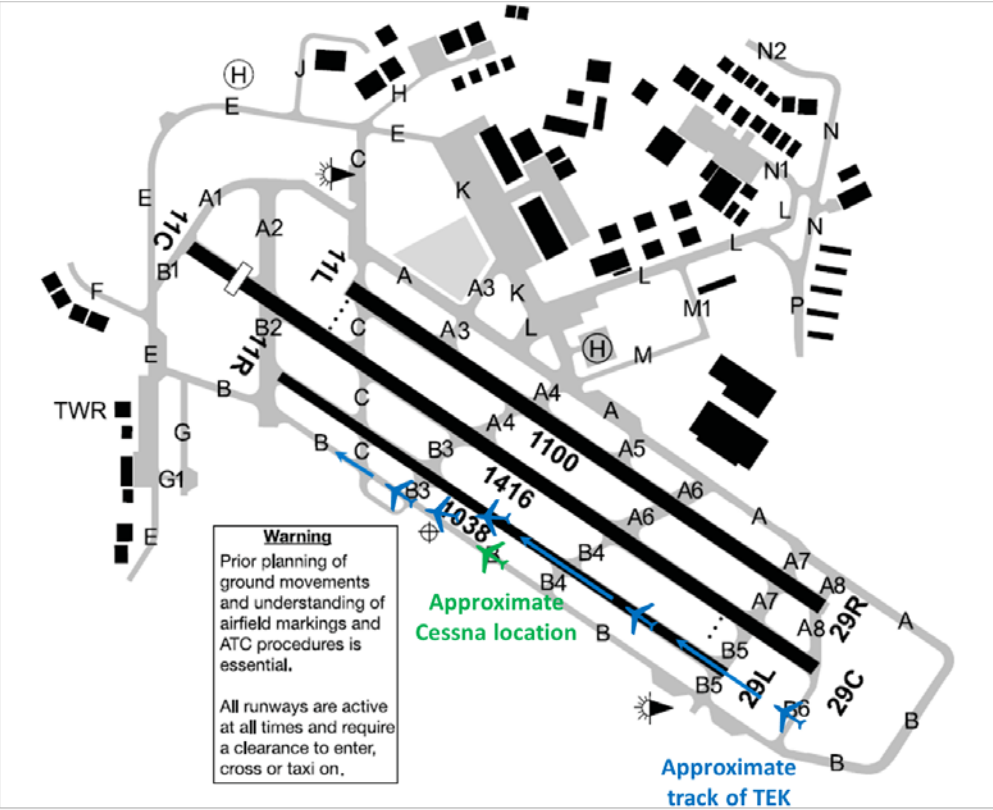
Source: Krzysztof Malek

On 3 July 2014, a Piper Aircraft Corp PA-28-161, registered VH-TEK, was returning from the training area via the 2RN reporting point to Bankstown Airport, New South Wales. The student pilot was the only person on board. The flight was conducted in visual meteorological conditions.

The student tracked from the 2RN reporting point and joined downwind for a touch-and-go landing on runway 29L. The student turned onto base and then final legs of the approach and Bankstown tower gave the student a clearance to conduct a touch-and-go. The student reported that the approach and landing were normal. As soon as the student felt the aircraft wheels were on the ground, the student reached down to the flap lever and selected the flaps to the retracted position.

The aircraft veered slightly to the right and then quickly to the left departing the runway and onto the grass strip (Figure 1). The student regained control of the aircraft and informed the tower of what happened and reported that he did not require assistance. The student then taxied onto taxiway B, between taxiway B4 and B3, passing about 20 meters in front of a taxiing Cessna 150. TEK was then taxied to the flying school without further incident. The student pilot was uninjured and the aircraft was not damaged.

Figure 1: Bankstown Airport chart



Source: Airservices Australia

Student pilot comment

The student pilot reported that he had been in the training area for about 30 to 40 minutes before returning to conduct some circuits. The student indicated that he did not remember any distractions at the time of the incident. The student was not able to remember any weather issues at the time. There was reported to be a westerly wind at a speed of about 5 knots. This would equate to a cross wind from the left of about 2 knots.

Operator investigation

The operator investigation was not able to determine the reason why the student pilot of TEK lost directional control during the landing. The student reported to the operator that he may have inadvertently applied right rudder and then left rudder while reaching for the flap lever. The student pilot had a total of about 25 hours flying experience and this was the second training area solo flight.

The operator found no mechanical faults with the 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 not been advised of any proactive safety action in response to this occurrence.

General details

Occurrence details

Date and time:	3 July 2014 – 1000 EST	
Occurrence category:	Serious incident	
Primary occurrence type:	Loss of control	
Location:	Bankstown Airport, New South Wales	
	Latitude: 33° 55.47' S	Longitude: 150° 59.30' E

Aircraft details

Manufacturer and model:	Piper Aircraft Corp PA-28-161	
Registration:	VH-TEK	
Serial number:	28-7916377	
Type of operation:	Flight training	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	None	

Near collision involving an Evektor Sportstar 24-4467, and a PA28R, Piper Arrow, VH-KGP

What happened

Piper Arrow, VH-KGP

Source: Airliners.net: Andrei Bezmylov

On 7 September 2014 at 1303 Eastern Standard Time, a Piper Arrow PA28R-200 aircraft, registered VH-KGP, was completing a private, visual flight rules (VFR) flight from Orange to Wollongong, New South Wales. On board were a pilot and one passenger.

Due to low cloud over the southern highlands, the pilot had diverted north of the direct track, in order to remain visual. When about 10 NM to the north of Wollongong, the pilot broadcast an inbound call on the common traffic advisory frequency (CTAF) (Table 1). At the time, an instructor and student in an Evektor Sportstar aircraft, registered 24-4467 (4467) (Figure 1) were one of two aircraft conducting circuit training at Wollongong.

The instructor and student in 4467 heard the pilot of KGP call inbound, and, although they did not communicate directly with the pilot of KGP, they broadcast their aircraft position and intentions (Table 1), making it clear that they were established in the circuit. Noting that runway 34 was in operation, the pilot of KGP began to manoeuvre the aircraft onto an oblique extended downwind leg (Figure 2).

The crew of the two aircraft remained in communication, although the exact position of KGP was not established until it was sighted at 1306.

An extract from the Wollongong CTAF recording, from the time the pilot of KGP made the 10 NM inbound call up until the aircraft turned base as number 1 to land, is reproduced in Table 1.

Figure 1: Sportstar 24-4467

Source: Airliners.net: Andrei Bezmylov

Table 1: Wollongong CTAF recording extract

Time	Aircraft	Transmission content
1303	KGP	All stations Wollongong, KGP an Arrow 10NM inbound from the north maintaining 2,000 ft.
1303	4467	Wollongong traffic Sportstar 4467 base 34 for a touch and go, Wollongong
1304	4467	Wollongong traffic Sportstar 4467 turning final 34, touch and go, Wollongong
0305	Unknown	Very short transmission - unreadable
0305	Unknown	Short transmission – unreadable (4 seconds after last transmission)
0305	Unknown	That was a right circuit for runway 34
0306	Other circuit traffic	Position and intentions in the circuit
1306	KGP	And Traffic Wollongong, KGP early downwind runway 34
1306	4467	“KGP this is Sportstar 4467, we have just turned downwind for runway 34; ah we are in your 12 o’clock, have you got us sighted yet?”
1306	KGP	“KGP is 900 ft, we have just avoided an aircraft taking off from 34, KGP “
1307	4467	“4467 we are established in the circuit, turning downwind, we will manoeuvre and be number two to you”
1307	KGP	KGP copied that, thanks for that”
1307	Other circuit traffic	“KGP, just confirm your height for us”
1307	KGP	“KGP is number one for runway 34, it will be a full stop”
1307	4467 and other traffic	Discussion on closeness of KGP and 4467
1308	KGP	KGP turning base runway 34

Figure 2: Approximate flight paths of KGP and 4467

Source: Google earth and ATSB

When 4467 was on the crosswind leg for a right circuit for runway 34 (Figure 2), the crew noted KGP on their left, about 100 m ahead and at about the same level as them. KGP was about 800-900 ft above ground level on an oblique approach to the downwind leg. The pilot in KGP was still visually searching for 4467 as he joined the extended leg of the circuit and began to descend.

Concerned about the proximity and current track of KGP, the instructor in 4467 initiated a climbing turn. Shortly after, KGP passed underneath and just behind 4467. KGP continued to descend on downwind, and 4467 manoeuvred to allow KGP to be first in the sequence to land.

KGP landed and vacated runway 34; 4467 conducted a go-around and then completed another couple of circuits prior to landing.

Pilot comments (24-4467)

The instructor commented that although they had heard the 10 NM inbound call from KGP at 1303, no estimate for arrival in the circuit was given. Hence they were not expecting the aircraft to arrive as early as it did; nor join the circuit from the oblique angle that it did. KGP joined the circuit on the inside of the circuit being flown by 4467.

Pilot comments (VH-KGP)

The pilot of KGP had flown into Wollongong airport on many previous occasions. He commented that the weather was more challenging than normal on this day, and he had to manoeuvre to keep the aircraft in visual conditions.

He also recalled making either a 5 NM or 3 NM inbound call. Table 1 shows that there were two unreadable short calls two minutes after the 10 NM broadcast, but due to the static interference, the ATSB was unable to decipher the calls.

The pilot also reported that he usually switches between the headphone and speaker selections on the KMA20 audio panel as he likes to keep the passengers involved in proceedings. He stated it is possible that he may have had an incorrect combination of switches set at some stage during the arrival into Wollongong.

Safety message

This incident highlights the importance of using standard phraseology, and making extra calls when there is any uncertainty regarding another aircraft's position when operating at non-controlled airports. As well as the regulated requirement for broadcasting, it is good airmanship to do so, considering the limitations of the See-and-Avoid Principle.

CASA CAR 166C outlines the broadcasting responsibilities for pilots at non-controlled airports. Also, CASA has recently updated the related Civil Aviation Advisory Publication, CAAP 166-1 and 2. This is available at: www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_100058

CAR 166 also contains a note directing pilots to the Aeronautical Information Publication (AIP) for the recommended format for broadcasting at non-controlled airports. AIP ENR 1.1 46, 47 give a summary of these broadcasts. This is available at: www.airservicesaustralia.com/publications/

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 (non-controlled) aerodromes www.atsb.gov.au/safetywatch/safety-around-aeros.aspx.

ATSB's research report, *Limitations of the See-and Avoid Principle* is available at www.atsb.gov.au/publications/2009/see-and-avoid.aspx.

General details

Occurrence details

Date and time:	07 September, 2014 2009 – 1245 EST	
Occurrence category:	Serious incident	
Primary occurrence type:	Near collision	
Location:	Wollongong Airport, New South Wales	
	Latitude: 34° 33.67' S	Longitude: 150° 47.32' E

Aircraft details

Manufacturer and model:	Evektor Aerotechnik SPORTSTAR	
Registration:	24-4467	
Serial number:	2005 0403	
Type of operation:	Flying training - dual	
Persons on board:	Crew – 2	Passengers – Nil
Injuries:	Crew – Nil	Passengers –N/A
Damage:	Nil	

Aircraft details

Manufacturer and model:	Piper Aircraft Corporation PA28R-200	
Registration:	VH-KGP	
Serial number:	28R-35611	
Type of operation:	Private - Pleasure	
Persons on board:	Crew – 1	Passengers – 1
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Wirestrike involving a Piper PA-25, VH-CPU

What happened

Damage to VH-CPU

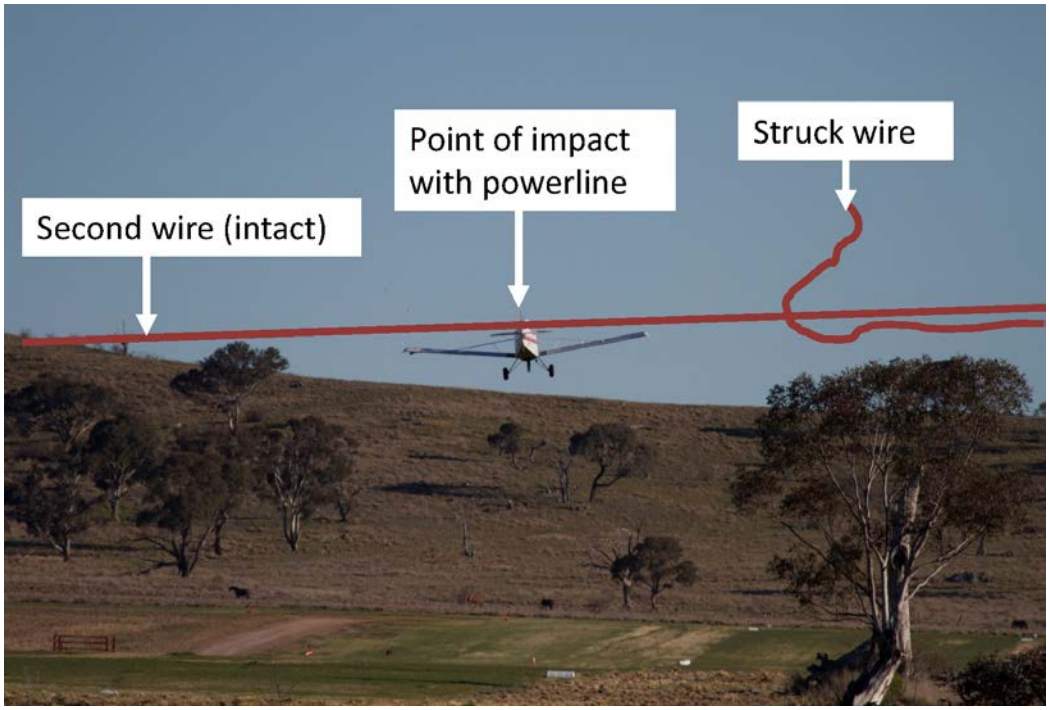
Source: Used with permission

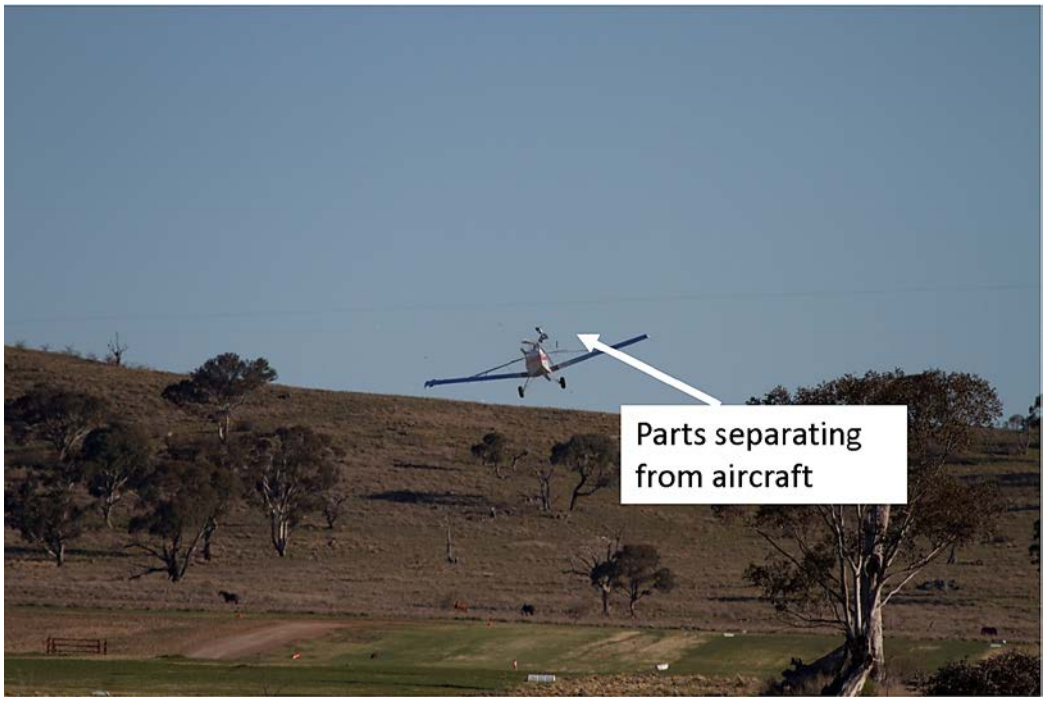
On 20 September 2014, the pilot of a Piper PA-25 aircraft, registered VH-CPU, conducted a ferry flight from Camden to Bunyan aeroplane landing area (ALA), via Goulburn, New South Wales.

After refuelling at Goulburn aerodrome, the pilot tracked to overhead Michelago and continued south towards Bunyan. About 10 km south of Michelago, the pilot intended to overfly a private airstrip to assess its condition and suitability as a potential out-landing site for gliders operating from Bunyan.

The aircraft was heading south and as the airstrip was oriented approximately north-south, the pilot elected to overfly the runway. The pilot observed the windsock indicating a southerly wind of about 8-10 kt. When about 300 m beyond the runway threshold, the aircraft struck powerlines that crossed the runway about 15 m above ground level, dislodging the windscreen and canopy (Figure 1). The top of the fin was severed by the powerlines.

Figure 1: Actual photographs showing VH-CPU wirestrike (wires enlarged for effect)

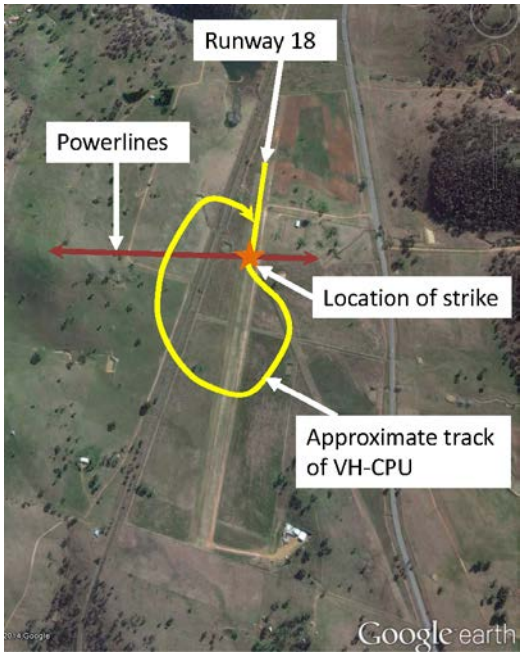




Source: Used with permission

The pilot attempted to broadcast a Mayday[1] call, but his headset was no longer in place. Immediately after the strike, the aircraft banked to the left before returning to level flight. The pilot assessed that the aircraft was too high to land ahead on the remaining runway and sighted a hill straight ahead. He then made a right turn, initially planning to land towards the north on the adjacent paddock. However, due to the rough surface of the paddock and tailwind, he conducted a short downwind leg before turning to the right, and the aircraft landed into wind on the runway (Figure 2).

Figure 2: Approximate flight path of VH-CPU



Source: Google earth and pilot recollection

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

Aeroplane landing area information

The privately-owned grass ALA had been constructed between September 2009 and March 2010. It was used by the land-owner, who reported that he did not authorise other aircraft to land on the airstrip. The owner reported that he had alerted a member of the gliding club to the powerlines and advised that the airstrip could only be used in an emergency. The owner had previously found evidence of other aircraft striking the powerlines.

The airstrip was oriented approximately north-south, with a useable length of about 1,200 m and a width of 20 m. The airstrip was mown grass and clearly marked by white rectangular markers. A windsock was located adjacent to the northern threshold.

The powerlines

Two 11 kV powerlines crossed the runway east to west about 300 m south of the northern threshold at about 15 m above ground level (AGL). The powerlines were constructed in 1992. A power pole was located immediately east of the runway with the two wires spanning about 800 m to a pole situated on the top of a hill.

Electricity infrastructure provider report

In a report provided to the ATSB, the company responsible for the powerlines infrastructure advised that a court order was issued in May 2011, which required the powerlines to be relocated or placed underground so as not to present a hazard to aircraft movements. In July 2011, the provider had offered to contribute to the cost of having the powerlines run underground, however this had not been carried out. No compliance date was placed on the order. In September 2013, four flag type marker flags had been fitted to the powerlines by the provider, following a request from the owner and as a matter of public safety.

Wire marking standards

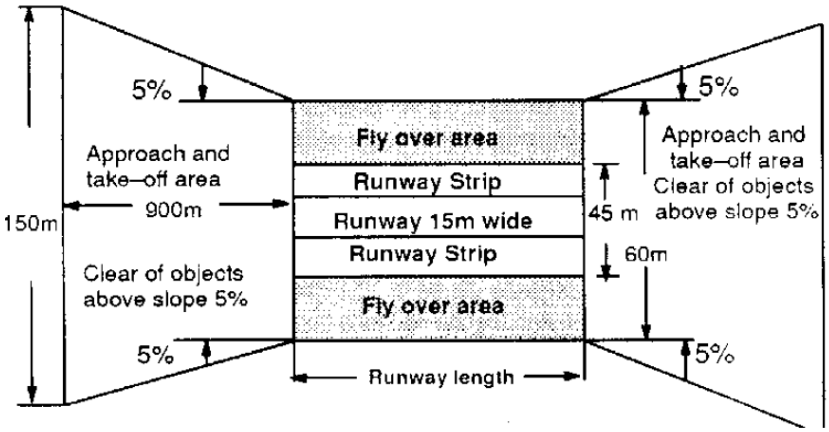
The requirements for mapping and marking powerlines and their supporting structures were published in *Australian Standard AS 3891.1, Part 1, Permanent marking of overhead cables and their supporting structures* and *AS 3891.2, Part 2, Marking of overhead cables for low level flying*. The ALA was not used as described in Clause 3.2 of AS 3891.1 nor were the powerlines in an area involved in planned low-flying operations as described in AS 3891.2. The powerlines did not require marking in accordance with either Australian Standard.

Advisory material

The Civil Aviation Advisory Publication (CAAP) 92-1(1) *Guidelines for aeroplane landing areas*,[2] provided guidance on how pilots may determine the suitability of an aeroplane landing area (ALA) such as the recommended obstacle clearance standards and suggested landing area markings. The CAAP defined an obstacle free area to mean 'there should be no wires or any other form of obstacles above the approach and take-off areas, runway, runway strips, fly-over areas or water channels'. The minimum landing area physical characteristics recommended in the CAAP for single-engine and centre-line thrust aeroplanes not exceeding 2,000 kg maximum take-off weight for day operations is depicted in Figure 3.

[2] www.casa.gov.au/scripts/nc.dll?WCMS:OLDASSET::svPath=/download/CAAPs/ops/,svFileName=92_1.pdf

Figure 3: Recommended landing area characteristics



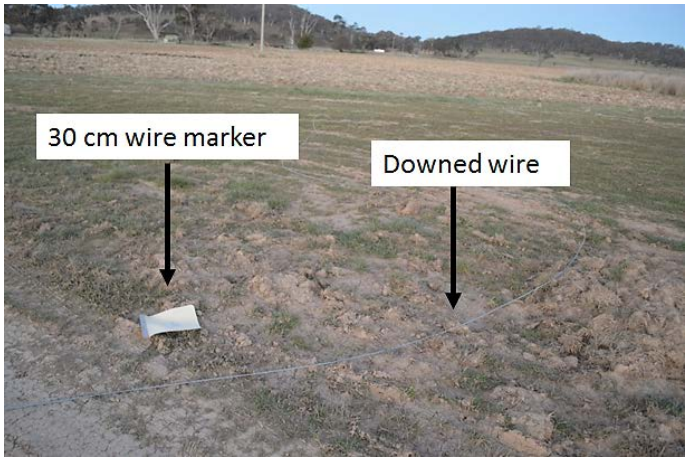
Source: Civil Aviation Safety Authority

Pilot hazard awareness

The pilot reported that he had overflown the airstrip and assessed its condition 3 to 4 times previously and was not aware of the wires. Gliding club members reported having previously been given verbal permission to use the landing strip. The pilot later found that some of the gliding club instructors knew of the powerlines' existence. The surrounding land was rocky and generally unsuitable for landing, making the airstrip appear to be a suitable emergency landing field.

The wires were marked with square off-white markers, about 30 cm wide, located adjacent to but not overhead the runway (Figure 4).

Figure 4: Wire marker



Source: Operator

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.

Gliding Federation of Australia

As a result of this occurrence, the Gliding Federation of Australia (GFA) has advised the ATSB that they are taking the following safety actions:

- The GFA has reminded all pilots operating into an unfamiliar landing area to remain vigilant and ensure the necessary precautions are taken to reduce the risks. Precautionary searches

are to be conducted initially from a safe height, working to lower level once risks have been identified.

- The GFA has reminded pilots of tow aircraft to ensure the owner of an airstrip or paddock has given permission to operate there and provided information regarding powerlines and other potential hazards.
- The GFA recommended all gliding clubs fit passive wire-strike protection systems to tow aircraft, especially those used for paddock retrieves.

Safety message

Research conducted by the ATSB found that 166 aircraft wirestrikes were reported to the ATSB between July 2003 and mid-June 2011 and another 101 occurred and were unreported but identified by electricity distribution and transmission companies. The majority of wirestrike occurrences were associated with aerial agriculture operations however, 22 occurrences (8 per cent) involved private operations. The research report, *Under reporting of aviation wirestrikes*, is available at www.atsb.gov.au/publications/2011/ar2011004.aspx.

The ability of pilots to detect powerlines depends on the physical characteristics of the powerline such as the spacing of power poles, the orientation of the wire, and the effect of weather conditions, especially visibility.

Depending on the environmental conditions, powerlines may not be contrasted against the surrounding environment. Often the wires will blend into the background vegetation and cannot be recognised. In addition, the wire itself can be beyond the resolving power of the eye: that is, the size of the wire and limitations of the eye can mean that it is actually impossible to see the wire. As such, pilots are taught to use additional cues to identify powerlines, such as the associated clearings or easements in trees or fields that can underlie the powerline, or the power poles and buildings to which the powerlines may connect.

The ATSB publication, *Avoidable Accidents No. 2 – Wirestrikes involving known wires: A manageable aerial agriculture hazard*, www.atsb.gov.au/publications/2011/avoidable-2-ar-2011-028.aspx advises pilots to always conduct an aerial reconnaissance to confirm wire locations and other hazards.

Risks associated with operations to private airstrips can be mitigated by ALA owners assessing their airstrips against the guidance in CAAP 92-1(1) *Guidelines for aeroplane landing areas*. Such risk assessments would benefit from giving consideration to first time users of the ALA.

General details

Occurrence details

Date and time:	20 September 2014 – 1630 EST	
Occurrence category:	Accident	
Primary occurrence type:	Wirestrike	
Location:	near Michelago, New South Wales	
	Latitude: 35° 47.47' S	Longitude: 149° 09.5' E

Aircraft details

Manufacturer and model:	Piper Aircraft Corporation PA-25	
Registration:	VH-CPU	
Serial number:	25-3607	
Type of operation:	Private	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Substantial	

Collision with terrain involving a Cessna 206, VH-KRR

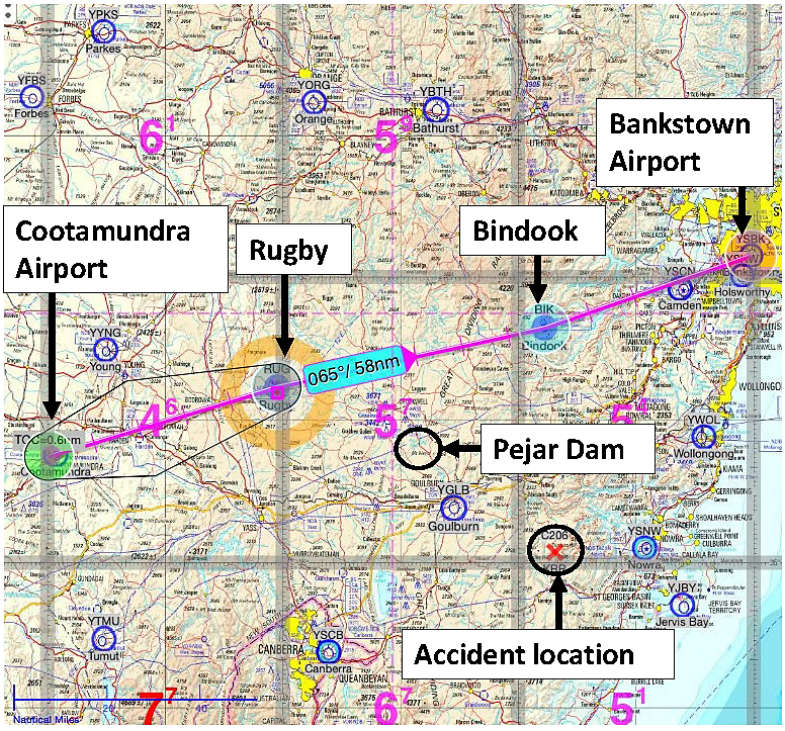
What happened

On 16 October 2014, the pilot of a Cessna 206 aircraft, registered VH-KRR, conducted pre-flight preparations for a solo training flight from Bankstown, New South Wales to Cootamundra and return. The pilot filled both the left and right fuel tanks to full, or 150 litres, with a total of 300 litres of fuel on board. Based on a planned fuel consumption rate of 60 litres per hour, this provided a fuel endurance of 300 minutes. At about 0800 Eastern Daylight Time, the aircraft departed Bankstown Airport with the fuel selected to the right tank. At about 0830, the pilot selected the fuel to the left tank and at about 0930 the pilot selected the right tank.

At about 0943, the aircraft landed at Cootamundra Airport. During taxi, the pilot selected the left fuel tank. After taxiing to the parking bay and shutting down the engine, the pilot dipped the fuel tanks. He reported that 100 litres remained in the right tank and 85 litres in the left. This indicated an actual fuel consumption rate of about 67-70 litres/hour, and about 12 litres less fuel remaining in the tanks than the pilot had expected. The pilot had calculated prior to departing Bankstown that the fuel required for the return flight was 66 litres and assessed therefore that sufficient fuel remained on board.

At about 1022 the aircraft departed Cootamundra with the right fuel tank selected. The planned route from Cootamundra to Bankstown was via Rugby and Bindook (Figure 1).

Figure 1: Planned route and accident location



Source: Aircraft owner

At about 1030, the pilot selected the left fuel tank. At about 1100, he observed that the aircraft had deviated from the planned track. He re-established the aircraft's position as overhead Pejar Dam. The pilot then selected the frequency for the Bindook non-directional beacon (NDB) on the aircraft's automatic direction finder (ADF) and attempted to track direct to Bindook. The pilot

reported then taking up a heading of about 120°, which resulted in a further deviation from the planned track rather than a turn towards it.

At about 1114, and when at about 5,500 feet above mean sea level, the aircraft's engine surged and then stopped. The pilot conducted some emergency checks including an attempt to restart the engine, but did not select the fuel pump ON or change the selected fuel tank. The pilot broadcast a Mayday[1] call, assumed a glide speed of about 75 knots and looked for a suitable landing area. Initially the pilot observed only heavily treed areas, but when passing about 3,500 feet on descent, he sighted a clearing ahead. The pilot did not extend the flaps, so as to increase the glide range of the aircraft, and reduced the airspeed to about 65 knots just prior to impact. The aircraft collided with trees about 50 metres short of the intended landing site and was substantially damaged (Figure 2). The pilot sustained a minor injury.

Figure 2: Damage to VH-KRR

Source: Aircraft owner

The pilot reported that, by his calculations, at least 35 minutes of fuel endurance remained at the time of the accident.

Post-accident inspection

The aircraft owners attended the accident site on Friday 17 October. They reported that about 7 litres of (unusable) fuel remained in the right tank and none in the left. The fuel bladders appeared to be intact and they did not observe any evidence of spilled fuel. The left fuel tank was selected and the master and magneto switches were ON. The engine casing was intact and there was no evidence of catastrophic engine damage.

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

Safety message

This incident highlights the importance of thorough pre-flight planning and monitoring and reassessing actual versus planned flight tracks and aircraft fuel consumption.

The ATSB publication *Avoidable Accidents No. 5 – Starved and exhausted: Fuel management aviation accidents*, www.atsb.gov.au/publications/2012/avoidable-5-ar-2011-112.aspx, states that

> *Accurate fuel management also relies on a method of knowing how much fuel is being consumed. Many variables can influence the fuel flow, such as changed power settings, the use of non-standard fuel leaning techniques, or flying at different cruise levels to those planned. If they are not considered and appropriately managed then the pilot's awareness of the remaining usable fuel may be diminished.*

CAAP 234-4(1)[2] *Guidelines for Aircraft Fuel Requirements*, states that fuel gauges, particularly on smaller aircraft, may be unreliable. In an aircraft that is not fitted with a fuel flow indicator, the fuel gauges should not be relied on as the sole means of calculating fuel burn in flight.

General details

Occurrence details

Date and time:	16 October 2014 – 1123 EDT	
Occurrence category:	Accident	
Primary occurrence type:	Collision with terrain	
Location:	33 km W Nowra Airport, New South Wales	
	Latitude: 34° 52.93' S	Longitude: 150° 10.87' E

Aircraft details

Manufacturer and model:	Cessna Aircraft Company U206F	
Registration:	VH-KRR	
Serial number:	U20603210	
Type of operation:	Flying training - solo	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – 1 (Minor)	Passengers – Nil
Damage:	Substantial	

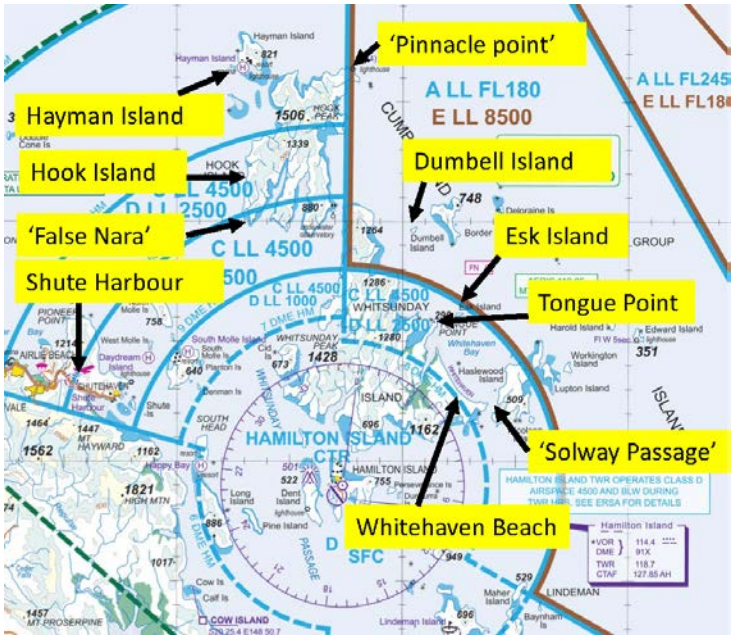
[2] www.casa.gov.au/wcmswr/_assets/main/download/caaps/ops/234_1.pdf

Near collision involving a de Havilland DHC-2, VH-AWD and a Gippsland Aeronautics GA-8, VH-NOQ

What happened

On 31 October 2014, the pilot of a de Havilland DHC-2 aircraft, registered VH-AWD (AWD), was conducting a scenic charter flight from Hayman Island Water Landing Area, Queensland, with five passengers on board. The aircraft tracked to the north of Hook Island (Figure 1), and climbed towards Pinnacle Point. The pilot of AWD broadcast on the common traffic advisory frequency (CTAF)[1] when passing Pinnacle Point.

Figure 1: Hamilton Island visual terminal chart with reference locations



Source: Airservices Australia and pilot recollection

The broadcast from AWD was heard by the pilot of a Gippsland Aeronautics GA-8 aircraft, registered VH-NOQ (NOQ), which had departed from Shute Harbour Airport at about 1325 Eastern Standard Time (EST) for a 30 minute scenic charter flight, with four passengers on board. Although he heard the broadcast, the pilot of NOQ did not know where Pinnacle Point was as it was not labelled on the Hamilton Island visual terminal chart (VTC).

The pilot of NOQ broadcast on the CTAF after passing Tongue Point and heading south along Whitehaven Beach. At about the same time, AWD was overhead Dumbell Island and the pilot of AWD was providing a commentary to the passengers. The pilot of AWD heard a broadcast on the CTAF, possibly that of the pilot of NOQ at Tongue Point, but did not hear the contents of the

[1] The ATSB obtained a copy of the CTAF recordings but none of the reported transmissions on that frequency could be verified. This may have been due to terrain shielding and/or the level of signal/noise ratio selected by the airport operator.

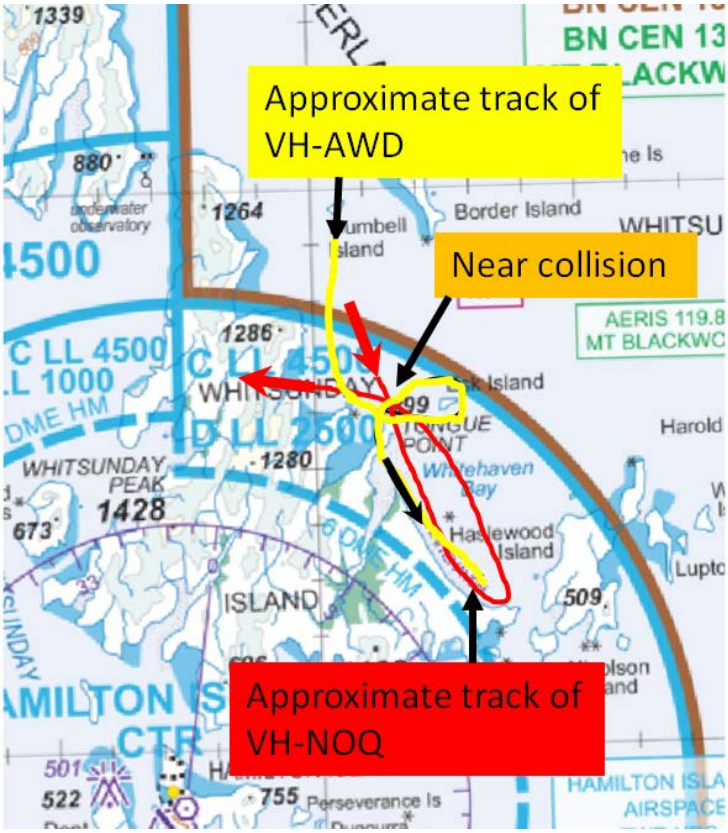
broadcast. As he missed the broadcast, the pilot of AWD then broadcast his position and intentions, and did not receive a response.

NOQ then tracked to the southern end of Whitehaven Beach, turned and headed north returning to Tongue Point. When just south of Tongue Point for the second time, the pilot of NOQ broadcast on the CTAF, detailing his intention to track to Hamilton Island and advising that he was changing to Hamilton Island air traffic control (ATC) Tower frequency. The pilot then commenced a left turn, selected the Tower frequency and was no longer monitoring the CTAF.

At about 1352 Eastern Standard Time, the pilot of NOQ advised Hamilton Island Tower that NOQ was at Tongue Point at 1,000 ft and tracking via the Northern Tip to Shute Harbour.

At about 1354, and at a height of 1,300 ft, as AWD approached Tongue Point from Dumbell Island (Figure 2), the pilot of AWD commenced a left turn to head towards Esk Island. While providing commentary to the passengers, and glancing out at the beach to ensure the aircraft was positioned correctly, the pilot sighted NOQ on a reciprocal track and estimated the aircraft passed on his right about 50 m away and about 50 ft above AWD. Both aircraft were turning left at the time.

Figure 2: Aircraft tracks overlaid on Hamilton Island visual terminal chart



Source: Airservices Australia and pilot recollection

The pilot of AWD then attempted to communicate with the pilot of NOQ on the CTAF but did not receive a response. He then checked the frequency selected, the avionics COMM selector, and the squelch, and confirmed the radio was functioning normally. AWD then completed a left turn around Esk Island and the pilot broadcast on the CTAF approaching Tongue Point for a left turn followed by a water landing at Southern Whitehaven and did not receive a response. The pilot of NOQ did not see AWD at any time. AWD then landed in the southern corner of Whitehaven Beach.

Pilot comments – VH-NOQ

The pilot of NOQ provided the following comments:

- He heard the pilot of AWD report at Pinnacle Point, but did not know where that was. Other pilots and ATC referred to locations that were not on the visual terminal chart (VTC) and as this was only his fourth flight in the area, he did not know where they were.
- He started and finished both radio broadcasts on the CTAF when in the vicinity of Whitehaven Beach with 'Whitehaven Traffic' in an attempt to alert other aircraft to his location.
- The radio transmissions from AWD were distorted and could be hard to hear.
- Use of a distance from known points, for example 1.5 miles north of Tongue Point, instead of features that are not depicted on the VTC would assist in understanding where an aircraft was operating.
- When entering controlled airspace, pilots were often required by ATC to report at Tongue Point or Solway Passage – which is also not marked on the VTC.
- Tongue Point is a crossover point for traffic in multiple directions.
- He had all the aircraft lights on: taxi lights, strobes, navigation lights and the beacon.
- He heard the broadcast from the pilot of AWD but did not know where Pinnacle Point was. In future he would call the pilot directly and request clarification of the aircraft's position.
- The second radio was on company frequency as they were travelling with two other company aircraft.

Pilot comments – VH-AWD

The pilot of AWD provided the following comments:

- The aircraft was fitted with two radios. The primary radio was selected to CTAF and the secondary radio was selected to company frequency as he did not intend to operate inside controlled airspace. If he were going to enter the Control Zone, he would use the secondary radio to monitor the CTAF and use the primary radio to obtain a clearance from the Tower prior to entering the zone.
- The aircraft is noisy but the radio is quite audible.
- Due to the frequency change requirements associated with the Hamilton Island control zone, there was a greater risk of collision at Tongue Point, Solway Passage and Happy Bay. There were no local procedures specifying traffic direction or hazard alerts at those points.
- He had the aircraft rotating beacon on but not the landing lights at the time of the incident.
- To avoid similar incidents occurring, aircraft fitted with two radios intending to enter controlled airspace should monitor the CTAF until entering the control zone.
- Pinnacle Point is the lighthouse on Hook Island and has been used for many years by local operators. In comparison, the 'Northern Tip' location is a recent term, is not marked on the VTC, and has been used to refer to different islands by both ATC and pilots. ATC also use False Nara as a standard inbound reporting point and it is not marked on the VTC.
- Some radio calls may have been affected by terrain shielding.

Airservices Australia comment

Airservices Australia provided the following comments in relation to the investigation:

- The Hamilton Island Tower Local Instructions for air traffic controllers contain a list of local places and flight strip abbreviations which are used by ATC for the provision of traffic management, a number of which are not identified on the VTC.
- Currently the Aeronautical Information Publication (AIP) does not prevent a pilot from reporting positions that are not identified on the aeronautical charts, as long as they positively fix the

aircraft position by visual reference to features shown on a topographical chart at intervals not exceeding 30 minutes (AIP ENR 1.1 19.2.1 (b)).

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.

Aircraft operator: VH-AWD

As a result of this occurrence, the operator of VH-AWD sent an email to all company pilots reminding them to maintain a diligent listening watch in all high traffic areas, and particularly when approaching a radio frequency boundary. Pilots were recommended to monitor both Hamilton Island Tower and the common traffic advisory frequencies until established within the Tower control zone boundary.

Aircraft operator: VH-NOQ

As a result of this occurrence, the operator of VH-NOQ sent an email to all company pilots reminding them of the following:

- Keep a vigilant lookout when transiting between the control zone and the CTAF.
- Always include the phrase 'switching to tower frequency' on the last CTAF call prior to entering controlled airspace. Following this call, wait 5-6 seconds before actually changing frequency to allow any conflicting aircraft to make contact on the CTAF.
- If possible, continue to monitor both frequencies by using two radios.

Airservices Australia

Airservices Australia advised that they are planning to seek industry input at the North Queensland Regional Airspace and Procedures Advisory Committee (RAPAC) meeting on amending reporting points on the VTC. Pending the outcome from industry and internal consultation, Airservices will determine any actions required for continual safety improvement.

Safety message

Issues associated with unalerted see-and-avoid have been detailed in the ATSB's research report *Limitations of the See-and-Avoid Principle*. The report highlights that unalerted see-and-avoid relies entirely on the pilot's ability to sight other aircraft. Broadcasting calls on the appropriate frequency is known as radio-alerted see-and-avoid, and assists by supporting a pilot's visual lookout for traffic. An alerted traffic search is more likely to be successful as knowing where to look greatly increases the chances of sighting traffic. The report is available at www.atsb.gov.au/publications/2009/see-and-avoid.aspx.

This incident highlights the importance of broadcasting radio calls on, and monitoring, the appropriate frequency, to alert pilots and assist in see-and-avoid practices. It serves as a reminder to keep a good lookout for other aircraft, particularly around high traffic areas and radio frequency zone boundaries.

General details

Occurrence details

Date and time:	31 October 2014 – 1354 EST	
Occurrence category:	Serious incident	
Primary occurrence type:	Near collision	
Location:	16 km NNE Hamilton Island Airport, Queensland	
	Latitude: 20° 13.90' S	Longitude: 149° 01.55' E

Aircraft details: VH-AWD

Manufacturer and model:	de Havilland DHC-2	
Registration:	VH-AWD	
Serial number:	1066	
Type of operation:	Charter	
Persons on board:	Crew – 1	Passengers – 5
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Aircraft details: VH-NOQ

Manufacturer and model:	Gippsland Aeronautics GA-8	
Registration:	VH-NOQ	
Serial number:	GA8-07-127	
Type of operation:	Charter	
Persons on board:	Crew – 1	Passengers – 4
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Helicopters

Loss of control during landing, involving a Bell 206B3, VH-CLR

What happened

VH-CLR on Mount Cook

Source: Queensland Police

On 7 October 2014 at about 0800 Eastern Standard Time, the pilot of a Bell 206B3 helicopter registered VH-CLR, departed Cairns, Queensland with one passenger on board. The purpose of the flight was to conduct a charter flight to Mount Cook, about 9 km south-east of Cooktown Airport, Queensland.

As the pilot had not used the landing area previously, he conducted an aerial reconnaissance of Mount Cook prior to arriving at Cooktown Airport to pick up the remaining passengers. In order to assess the conditions, he made 3-4 practice approaches and a practice landing, touching down with the right skid onto the ledge. He assessed that stabilising the helicopter with the right skid for the embarking and disembarking of the passengers would be preferable to the previously decided method of using both skids on the uneven surface. The landing area was a rocky ledge jutting out from the south-eastern side near the top of Mount Cook (Figure 1).

After a short break at the airport, and following a passenger safety brief, the pilot conducted two flights up to the landing area on Mount Cook, dropping off a total of five passengers. He reported that the wind during these two flights was estimated to be about 10 knots from the south-east. While waiting back at the airport for the clients to complete their work, the pilot contacted his company to discuss his concerns regarding the greater risk than anticipated of operating onto the landing site. The decision was made to have a full debrief and updated risk assessment of operations at Mount Cook, at the completion of the charter.

Figure 1: Approaching to land on Mount Cook (Ground co-ordinator in foreground)

Source: Peter Scott

After checking the current wind in the area on the Airservices Australia briefing website, the pilot returned to the Mount Cook landing site at about 1145 to pick up the first load of passengers. By now, the wind had increased to about 14-15 knots.

During the approach to land, the pilot reported that he felt the helicopter was stable and appeared unaffected by the increased wind. He was guided into the landing area by the charter client's ground co-ordinator, who remained in radio contact with him. The ground co-ordinator also managed the loading and unloading of passengers. Although all five people on the ground had initially remained clear, as the helicopter prepared to touchdown, both the ground co-ordinator and one of the passengers planning to board moved closer (Figure 1).

Just prior to stabilising the helicopter and touching down on the right skid, the pilot felt it momentarily lift, most likely from a gust of wind, and drift to the right. The right skid then scraped along the rock ledge. The helicopter rolled rapidly onto its right side and slid a short distance forward, prior to coming to rest.

The pilot immediately shut down the helicopter and exited through the broken front windscreen. One of the waiting passengers and ground controller had both been struck by the helicopter and the passenger was still trapped underneath; the remaining personnel worked to raise the helicopter sufficiently to allow him to free himself. The ground controller had been knocked unconscious. An ambulance officer in the group called emergency services, and then took over management of the unconscious man.

As there was some smoke from the helicopter exhaust, the pilot returned to the cockpit and removed the fire extinguisher, at the same time rechecking that all switches were off. However, he elected not to discharge the fire extinguisher.

The pilot and one passenger sustained minor injuries and the ground controller was seriously injured. The helicopter was substantially damaged (Figure 2).

Figure 2: VH-CLR post accident

Source: Peter Scott

Pilot experience and comments

The pilot had about 7,300 hours total flying experience, with about 770 flight hours on the B206. He held the position of chief pilot and chief flying instructor for the company. He was also a Civil Aviation Safety Authority (CASA) approved test officer (ATO).

He commented that as he had not landed at the site prior to this day, he had conducted a thorough aerial reconnaissance, including practice approaches in the conditions, prior to landing with the passengers. He had also checked the helicopter tail clearance while manoeuvring during this session.

He commented that during the accident approach, the wind was coming from between the 9 o'clock and 12 o'clock positions. Although the trees around the site were showing some effect from the wind, the helicopter appeared unaffected.

He had returned from three days off work and was well rested prior to the charter flight. He had consumed food and had kept himself well hydrated throughout the morning.

In hindsight, he advised that charter operations should be limited to properly prepared landing sites. He was surprised how quickly the wind had contributed, turning a stable approach into an accident.

Operator comments

The purpose of the charter flight was to conduct an inspection of the location for a new purpose built helicopter landing site (HLS) which would permit access to telecommunications infrastructure located on the mountain.

As the pilot had been on leave for the three days prior to the accident, there had been no opportunity for him to discuss the landing site with the client. He did however have a brief discussion with the deputy chief pilot on the morning of the charter.

The Mount Cook HLS had not previously been used by this company, so the client provided details and site photos about it to them. However, the company felt the site photos were a little misleading as they gave the impression that the surface was reasonably flat. The chief and deputy chief pilots decided the best method would be to land on both skids, high up on the rocky outcrop. It was assessed that this would provide a more stable footing for embarking and disembarking the passengers.

After the aerial reconnaissance, and noting the uneven surface of the rocky ledge, the pilot altered this decision and elected to only place the right skid on the landing surface.

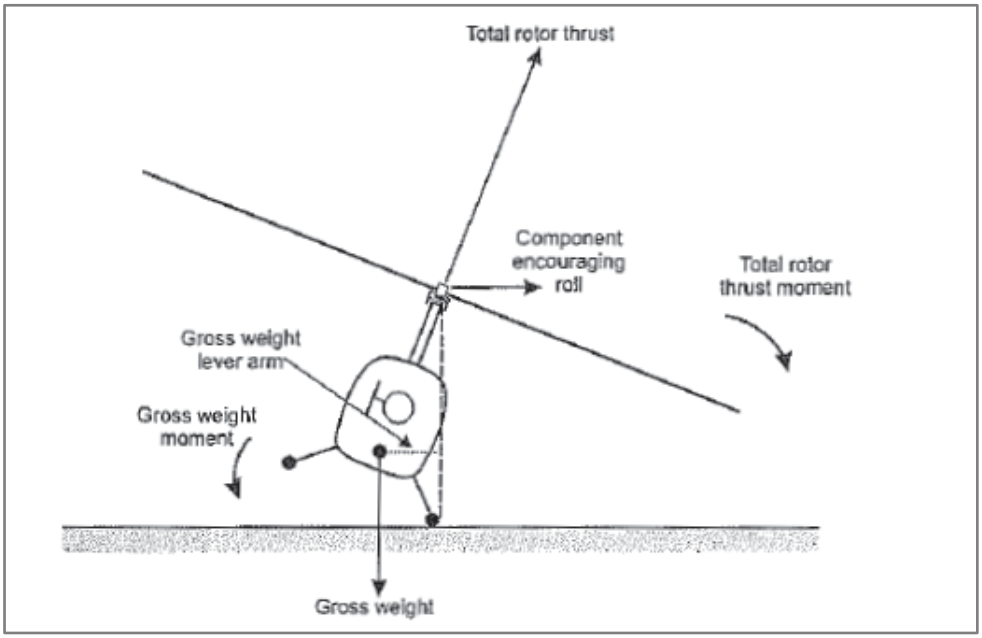
ATSB comment

The roll onto the right side by the helicopter is consistent with the phenomenon known as dynamic rollover.

When a helicopter rests on one skid, the aircraft may begin rolling, and under certain circumstances it cannot be controlled. This is known as dynamic rollover.

Figure 2 shows the forces involved in dynamic rollover. A moment is produced by the horizontal component of total rotor thrust about the point of ground contact of the skid. This moment is opposed by the weight of the helicopter and decreases as the helicopter is placed in progressively steeper banks. The horizontal component of total rotor thrust is related to the angle of bank or roll. Beyond a specific angle of bank it is impossible to stop further roll, and if the helicopter is kept in contact with the ground, it will fall. This angle is known as the critical angle.

Figure 2: Dynamic rollover



Source: Principles of Helicopter Flight, 2nd ed., W.J. Wagtendonk

The rate at which the roll takes place influences the critical angle. When the right skid is on the ground, tail rotor drift to the right encourages further roll that results in the critical angle being smaller. Any crosswind from the left which causes disc blow-back to the right exacerbates the problem. (Principles of Helicopter Flight, 2nd ed., W.J. Wagtendonk)

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 have taken proactive safety actions, some of which are listed below:

Pre- flight planning

For all future charter operations, the company will allow sufficient time prior to the flight to thoroughly research any HLS previously unused by them. A comprehensive risk analysis will be completed, and then a suitable procedure developed for operations at the site.

Helicopter landing site

Operations at Mount Cook will cease until a helicopter landing pad compliant with Civil Aviation Advisory Publication 92.2.2 (2) has been installed and inspected for use. A review of the register containing all the company HLS will be undertaken.

CAAP 92.2.2 (2) is available on the CASA website at:

www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_91054

Commercial Pressure

No company pilot, or any other member of staff should ever be subject to undue pressure to complete tasks they judge to be unsafe or outside their individual capabilities. This culture is to be continuously reinforced throughout the organisation.

Communications and Safety Equipment

A satellite phone should be included as minimum equipment on any flights north of Mossman and west of Mareeba, Queensland.

General details

Occurrence details

Date and time:	07 October 2014 – 1145 EST	
Occurrence category:	Accident	
Primary occurrence type:	Loss of control	
Location:	9 km south – east of Cooktown Airport (Mount Cook), Queensland	
	Latitude: 15° 29.22’ S	Longitude: 145° 15.42’ E

Aircraft details

Manufacturer and model:	Bell Helicopter Co 206B (111)	
Registration:	VH-CLR	
Serial number:	3349	
Type of operation:	Charter	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Minor	Passengers – Nil
Persons on ground	1 Minor, 1 serious	
Damage:	Substantial	

Windshear event involving a Eurocopter EC120B, VH-BGB

What happened

On 21 October 2014, the pilot of a Eurocopter EC120B helicopter, registered VH-BGB, conducted a charter flight from a ship about 24 nautical miles north-north-west of Port Hedland to transfer two marine pilots to Port Hedland Airport, Western Australia. The flight was conducted under the night visual flight rules.

Prior to take-off, the pilot observed the windsock on board the ship indicating calm wind conditions. At about 2240 Western Standard Time, the helicopter lifted off and the pilot commenced the climb and transitioned to a forward airspeed of about 15 knots. As the helicopter passed over the bow of the ship, it encountered windshear. Approaching about 350 feet above sea level, the pilot observed the airspeed indicating about 5 knots. He reported that his focus had momentarily been on the radar altimeter and he had not detected the airspeed decaying. He immediately applied forward cyclic[1] to increase the airspeed, and then continued the climb to 1,500 feet and proceeded to Port Hedland without further incident.

The pilot did not receive any warnings and the helicopter remained in stable flight throughout.

Pilot comments

The pilot reported that in a normal climb, by about 400 feet he would expect the airspeed to be approaching 40 knots. He believed that his delay in recognising the decreasing airspeed was due to feeling unwell. He had some symptoms of a cold prior to the flight. The next morning he sought medical attention and was prescribed antibiotics. He had been on duty for about 22 hours prior to the incident and had slept for about 2 hours during that time. The base pilots were operating on a 24 hour shift cycle, with a minimum 5 hours' sleep to be taken during that period.

Figure 1: VH-BGB

Source: Operator

[1] The cyclic pitch control, or cyclic, is a primary flight control that allows the pilot to fly the helicopter in any direction of travel: forward, rearward, left and right.

Safety action

Helicopter operator

As a result of this occurrence, the helicopter operator issued a Safety Notice to all company pilots reminding them of the importance of managing fatigue and fitness to fly in accordance with their Fatigue Management policy.

Safety message

The ATSB report *Pilot Incapacitation: Analysis of Medical Conditions Affecting Pilots Involved in Accidents and Incidents*, www.atsb.gov.au/publications/2007/b20060170.aspx, found that the majority of pilot incapacitation events between 1 January 1975 and 31 March 2006 did not involve a chronic or pre-existing medical condition.

One of the CASA's 'Out-N-Back' six part video series focuses on pilot decision making in regard to fitness to fly. It directs pilots to Civil Aviation Order (CAO) 48. This publication sets out clear guidelines in regard to fatigue assessment and management. The Civil Aviation Advisory Publications (CAAP) 48-1 offers further guidance. This Out-N-Back video and article can be found at:
www.services.casa.gov.au/outnback/inc/pages/episode3/episode3_Fatigue_management.shtml.

In addition, this 'I'm safe checklist' provide a means of self-checking one's current readiness to conduct a flight, www.ampl.ma/attachements/publication/509.pdf.

General details

Occurrence details

Date and time:	21 October 2014 – 2240 WST	
Occurrence category:	Incident	
Primary occurrence type:	Windshear event	
Location:	near Port Hedland Airport, Western Australia	
	Latitude: 20° 22.67' S	Longitude: 118° 37.58' E

Helicopter details

Manufacturer and model:	Eurocopter EC120B	
Registration:	VH-BGB	
Serial number:	1347	
Type of operation:	Charter – passenger	
Persons on board:	Crew – 1	Passengers – 2
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

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

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Investigation

ATSB Transport Safety Report
Aviation Short Investigations
Aviation Short Investigations Bulletin Issue 38
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