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Aircraft proximity event between Beech 1900, VH-EMK and Airparts FU-24, VH-HVP

What happened

Jabiru airport

Source: Google Earth

On 5 October 2012, a Beech 1900 aircraft, registered VH-EMK (EMK), departed Darwin on a charter passenger flight to Jabiru, Northern Territory. The first officer (FO) was designated as the pilot flying.

At top of descent, the crew broadcast a call on the Brisbane Centre frequency advising that they were 40 NM to the west of Jabiru, leaving FL150[1], with an estimated time of arrival (ETA) for the circuit at 0654 Central Standard Time[2]. Brisbane Centre air traffic control advised of nil traffic for the descent.

At about 30 NM, the crew broadcast a call on the Jabiru common traffic advisory frequency (CTAF) advising they were inbound, with an ETA of 0654. The crew reported receiving the voice identification from the aerodrome frequency response unit (AFRU)[3]. The crew reported that no other broadcasts on the CTAF were heard.

When at about 15 NM, the crew broadcast a second inbound call on the CTAF advising they were tracking for a 5 NM final and would be established at 0654. With the traffic alert and collision avoidance system (TCAS) set to 15 NM, the crew continued to monitor the TCAS, with no traffic observed.

During the approach to runway 09, the crew observed a 'glint' on the runway. At the time, the Captain believed it may have been from a car operating on a road near the runway or an aerodrome officer completing a runway inspection, so he continued the approach.

Shortly after, at about 5 NM, the crew broadcast a call advising they were established on final for runway 09. They had not heard any other broadcasts on the CTAF since receiving their own inbound response from the AFRU. They again checked the TCAS, with no traffic observed.

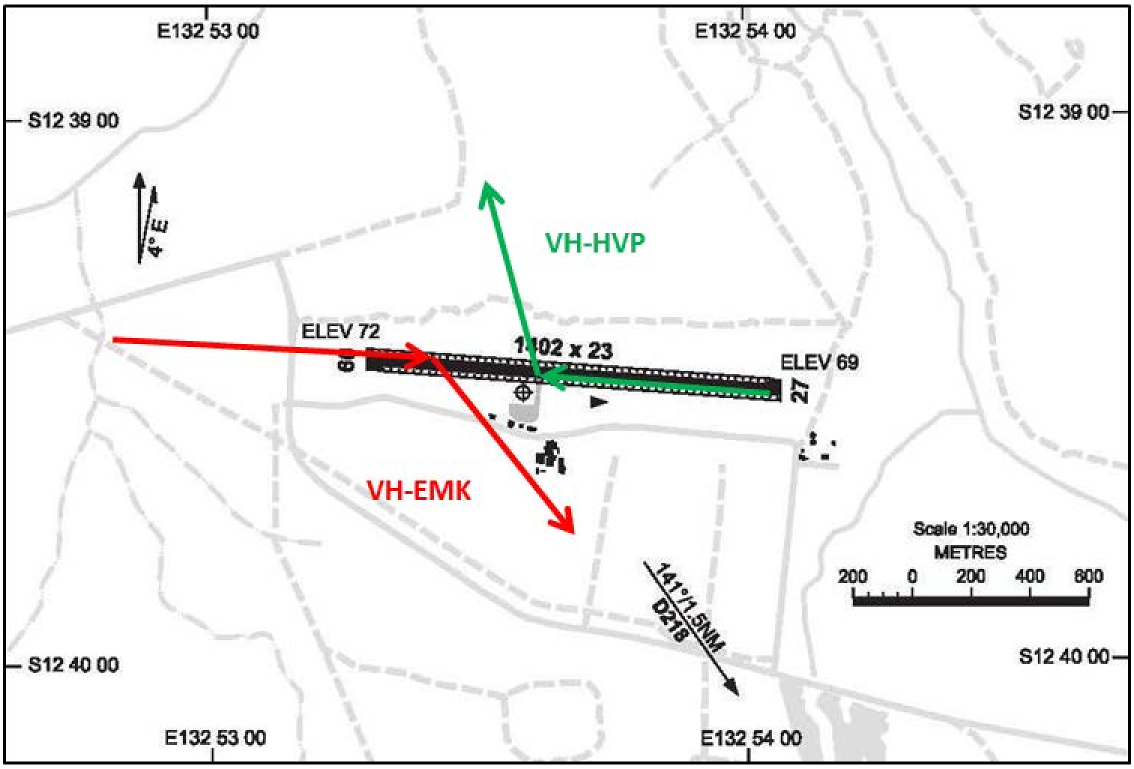
About 3NM from Jabiru, the Captain believed he may have observed something on the runway and broadcast a further call advising they were established on final.

[1] 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.

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

[3] Aerodrome frequency response unit (AFRU) is a VHF transceiver which provides an automatic response when the pilot transmits on the traffic frequency (normally CTAF) for a particular aerodrome.

Figure 1: Approximate aircraft positions



Source: *Airservices Australia*

Airparts FU-24, VH-HVP

At about 0645, an Airparts FU-24 aircraft, registered VH-HVP (HVP), was being prepared for an aerial survey flight in the Jabiru area. During pre-flight preparations, the pilot turned the aircraft's radio on and selected standby on the transponder[4].

Shortly after, the pilot broadcast on the CTAF advising that he was taxiing for runway 27. At that time, the pilot heard a broadcast from the crew of EMK advising they would be established on a 5 NM final at 0654. The pilot of HVP determined that he would have 4 minutes to depart, before EMK was reported to be established on final.

The pilot looked for traffic prior to entering the runway, with none sighted. The pilot broadcast a call advising he was entering and backtracking runway 27 and selected 'ALT'[5] on the transponder. The pilot reported that he did not receive any response to his broadcast and consequently believed there was no conflict with EMK.

The incident

At about 0652, the pilot of HVP estimated that EMK would be about 8-10 NM from the airport, and elected to commence the take-off.

When at about 1 NM inbound, the crew of EMK observed HVP taking-off on runway 27, directly opposite to their approach path. The Captain immediately called for a go-around, which the FO initiated. The FO took avoiding action by manoeuvring the aircraft to the right.

At the same time, the pilot of HVP observed EMK on final for runway 09, at about 500 ft. The pilot decided to continue the take-off as he did not want to remain on the runway if the crew of EMK had not sighted HVP.

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4 Transponder- is a form of Secondary Surveillance Radar (SSR) which emits an identifying signal to ATC.

5 The ALT key of the transponder which relays aircraft altitude information (Mode C) to ATC.

After take-off, at about 50 ft, the pilot of HVP turned the aircraft to the right to maintain separation with EMK. Immediately after, the pilot observed EMK in a climbing right turn.

Following the incident, the crew of EMK attempted to contact HVP on three occasions, but received no reply and HVP was not observed on the TCAS display. The pilot of HVP heard a broadcast from the crew of EMK and attempted to respond, but then realised that his radio was only receiving broadcasts and not transmitting.

The crew of EMK and HVP reported different assessments as to the minimum separation of the two aircraft. It appears that separation reduced to about 300 ft vertically and 200-250 m laterally.

VH-HVP radio selection

The aircraft's communication system consisted of a very high frequency (VHF) radio, a high frequency (HF) radio, and a satellite phone. One radio selector switch was used to activate each system. The pilot of HVP reported using the satellite phone the previous day. When changing the selection back to VHF, he inadvertently placed the selector in between the VHF and HF radio. The pilot further stated that he did not confirm the radio selection during his pre-flight checks.

VH-HVP transponder

The crew of EMK reported that HVP was not observed on the TCAS. When HVP was last operated in controlled airspace, the transponder was reported to be unserviceable and was repaired during HVP's last scheduled maintenance service. The PIC reported the transponder was confirmed as operational when it was checked following the incident.

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-HVP

As a result of this report, the operator of VH-HVP has undertaken the following actions:

- provided all pilots with copies of the ATSB publications listed in the safety message below, and
- has arranged for all pilots to re-visit company Standard Operating Procedures on radio transmissions and low-level survey flying.

Safety message

The practice of see-and-avoid has long been recognised as the primary method for minimising the risk of collision when flying in visual meteorological conditions; it is considered a crucial element of a pilot's situation awareness. An ATSB research report titled '*Limitations of the See-and-Avoid Principle*' showed that, when searching for traffic, alerted see-and-avoid (when a radio is used in combination with a visual lookout) is eight times more effective than un-alerted see-and-avoid (when no radio is used). However, pilots should be mindful that the absence of a traffic broadcast does not necessarily mean the absence of traffic. Pilots should remain vigilant and employ both un-alerted and alerted see-and-avoid principles to ensure the greatest level of traffic awareness is achieved.

This incident demonstrates the importance of checking the serviceability of radio equipment prior to flight. In particular, the use of available resources such as AFRU for ensuring the radio is transmitting. Carriage and use of radio is a mandatory requirement at all registered, certified and military non-towered aerodromes (CAR 166).

The following ATSB publications provide additional information:

- Safety Watch: Safety around non-towered aerodromes
  www.atsb.gov.au/safetywatch/safety-around-aeros.aspx
- Safety in the vicinity of non-towered aerodromes
  www.atsb.gov.au/publications/2008/ar-2008-044(2).aspx
- A pilot's guide to staying safe in the vicinity of non-towered aerodromes
  www.atsb.gov.au/publications/2008/ar-2008-044(1).aspx
- Limitations of the See-and-Avoid Principle
  www.atsb.gov.au/publications/1991/limit_see_avoid.aspx

General details

Occurrence details

Occurrence category:	Serious incident	
Primary occurrence type:	Airprox	
Location:	Jabiru Airport, Northern Territory	
	Latitude: 12° 39.50' S	Longitude: 132° 53.58' E

VH-EMK

Manufacturer and model:	Beechcraft Aircraft Corporation 1900C	
Registration:	VH-EMK	
Operator:	Vincent Aviation	
Type of operation:	Charter	
Persons on board:	Crew – 2	Passengers – 1
Injuries:	Crew – Nil	Passengers – Nil
Damage:	None	

VH-HVP

Manufacturer and model:	Airparts NZ LTD FU-24-954	
Registration:	VH-HVP	
Type of operation:	Aerial survey	
Persons on board:	Crew – 1	Passengers – 0
Injuries:	Crew – Nil	Passengers – Nil
Damage:	None	

Weather balloon event involving Bombardier DHC-8-400, VH-LQG

What happened

Weather balloon

Source: Bureau of Meteorology

On 26 October 2012, at about 0715 Western Standard Time[1], a Bombardier DHC-8-402 aircraft, registered VH-LQG (LQG), departed Perth on a scheduled passenger service to Geraldton, Western Australia. The first officer (FO) was designated as the pilot flying.

Shortly after takeoff, at about 700 ft, the captain observed a weather balloon above, in his 1 o'clock[2] position. The captain advised the FO, who immediately initiated a slight left turn.

The balloon was observed to pass about 10-20 m laterally from the right wingtip and the captain advised air traffic control (ATC).

Weather balloon

Bureau of Meteorology (BoM) weather balloons at Perth Airport are released by BoM staff at the airport using a remote balloon launcher four times per day at 0015, 0715, 1315 and 1915. Depending on the type of balloon used and the atmospheric conditions at the time, the balloon generally ascends for about 1 hour, reaching an altitude of about 60,000 ft. The balloon train (Figure 1) consists of a balloon, a reflective radar target and a radiosonde that conduct the following functions:

- **Balloon:** the balloon is inflated with a sufficient amount of hydrogen to allow it to ascend through the atmosphere at about 1,000 feet per minute.
- **Radar:** as the balloon ascends, radar is used to automatically track the movement of the reflective target, which enables the calculation of wind speed and direction.
- **Radiosondes**: the radiosonde transmits radio signals indicating pressure, temperature and humidity to a receiver located in the Perth Airport meteorological office. This enables temperature and moisture profiles of the atmosphere to be calculated.

ATC coordination

For the release of weather balloons within 3 NM of a controlled airport, a Letter of Agreement between Airservices Australia and the BoM, and the Manual of Air Traffic Services (5-10-300) state that:

- BoM staff are to contact the control tower and coordinate a balloon release.
- BoM staff are to conduct a visual examination of the airport environment immediately prior to releasing a balloon.
- ATC may delay a balloon release when there is a possibility of conflict with aircraft taking off, landing or conducting a go-around.
- ATC are to advise aircraft that may be operating in close proximity to the balloon below 2,000 ft (above ground level).

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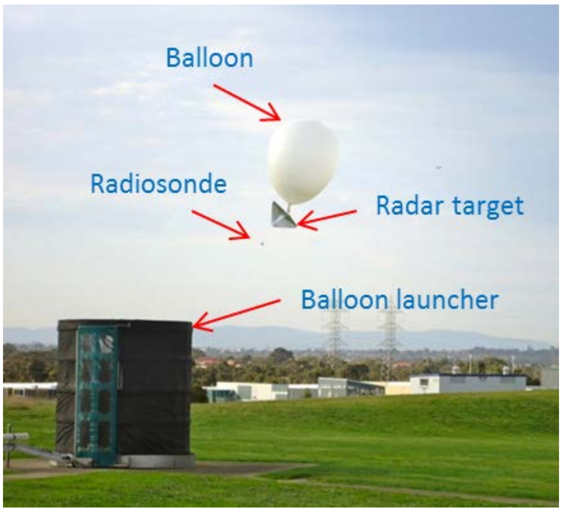
1 Western Standard Time (WST) was Coordinated Universal Time (UTC) + 8 hours.

2 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.

A review of Airservices Australia data showed that the BoM officer contacted the Perth control tower via telephone requesting permission to release a balloon at about 0715. At the same time, the crew of LQG received a clearance from ATC to line-up on runway 03. Permission was granted for the balloon release, and immediately after, the crew of LQG received an ATC clearance to takeoff.

Figure 1: Weather balloon train



Source: Bureau of Meteorology

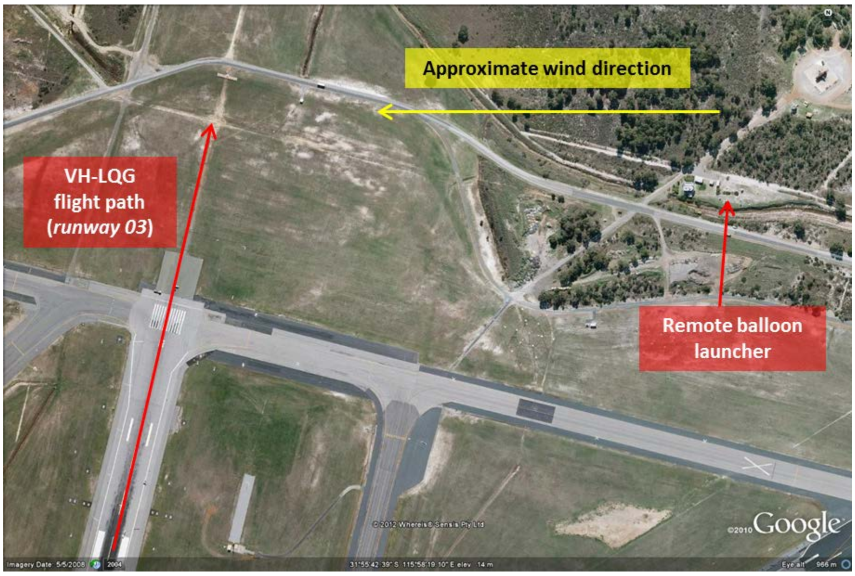
Pilot comments

The FO reported that he conducted a thorough lookout when entering the runway and did not observe any activity related to the release of the balloon. The captain also stated that they did not receive any advice regarding the release.

BoM officer comments

The BoM officer reported that he had conducted a scan immediately prior to the balloon release and did not observe any aircraft taking off. He further stated that it could be difficult to sight aircraft on the southern end of runway 03 due to a line of trees obscuring the view. After releasing the balloon, the officer observed an aircraft taking off on runway 03. The officer was concerned that the balloon may pass in front of the aircraft due to the strong easterly winds.

Figure 2: Perth Airport



Source: Airservices Australia

General details

Registration:	VH- LQG	
Manufacturer and model:	Bombardier Inc. DHC-8-402	
Operator:	Sunstate Airlines	
Type of operation:	Air transport – high capacity	
Occurrence category:	Incident	
Primary occurrence type:	Airspace related event	
Location:	Perth Airport, Western Australia	
	Latitude: 31° 56.42' S	Longitude: 115° 58.02' E
Persons on board:	Crew – 4	Passengers – 54
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Piston aircraft

Runway excursion involving Piper PA-39, VH-MMN

What happened

VH-MMN

Source: Pilot

On 26 October 2012, a Piper PA-39 (Twin Comanche) aircraft, registered VH-MMN (MMN), departed Broken Hill, New South Wales to attend a 'fly-in' at the Innamincka Township aeroplane landing area (ALA), South Australia. On board the aircraft were the pilot and a passenger.

When approaching the ALA, the pilot heard a broadcast on the common traffic advisory frequency (CTAF) for an inbound aircraft. Shortly after, the pilot of MMN also broadcast a call on the CTAF advising he was 10 NM out and inbound. The pilot of MMN later broadcast another call on the CTAF, at which time the preceding aircraft had joined the circuit for runway 28.

MMN joined the circuit, and when on the downwind leg, the pilot noted that the windsock was indicating a strong crosswind. As a precaution, the pilot elected to increase the aircraft's airspeed for the approach by about 5 kts and selected ½ flaps (about 15 degrees)[1].

The pilot turned the aircraft onto final about 200 ft higher than normal. At that time, the windsock was showing a 15 kt crosswind, from the south-west. The pilot focused on the crosswind and ensured that the aircraft remained aligned with the runway[2].

During the landing, at about 100 ft above the runway, the flare[3] was commenced. The aircraft floated and touched down about a quarter the way along the runway. The pilot reduced the throttle setting to the idle position and applied light braking.

When the aircraft was about half way along the runway, the pilot realised that the aircraft's speed was too fast and he applied full braking. The pilot determined that it was too late to commence a go-around. He reported that the braking appeared to be ineffective due to the surface of the runway and the aircraft continued beyond the runway end. The left landing gear struck a depression, and then the aircraft spun to the left and came to rest in a 1 m deep gully. The pilot and passenger exited the aircraft and the aircraft sustained serious damage (Figure 1).

Airstrip information

The Innamincka Township ALA had one gravel runway aligned 100°/280°, about 1,000 m (980 m usable) in length. The pilot reported that the surface of the runway, particularly towards the end of runway 28, contained a lot of small loose stones, which may have affected the braking capacity of the aircraft during the landing roll. The pilot also stated that there were markings on the runway indicating that the aircraft's brakes had intermittingly locked up during the landing. The pilot contacted the airport operator several days after the accident and was advised that the runway surface had since been rolled.

The pilot further reported that the ground prior to the threshold of runway 28 was rocky. Consequently, he elected to land further along the runway than normal to avoid the rough ground.

[1] When a crosswind component in excess of 12 kts existed, the aircraft's pilot operating handbook stated that an above normal approach speed and partial or no flaps should be used.

[2] The pilot reported that the runway was reasonably narrow, about 15-20 m wide.

[3] The flare, also known as the roundout, is the final nose-up of a landing aircraft to reduce the rate of descent to about zero at touchdown.

Figure 1: VH-MMN

Source: Pilot

Pilot comments

The pilot provided the following comments regarding the accident:

- **Landing type:** When a crosswind in excess of 12 kts existed, the pilot's operating handbook (POH) for the Twin Commanche stated that an above normal approach speed and partial or no flaps should be used. While the pilot selected an approach speed of about 5 kts above the normal speed, he reported that he was being overly cautious and this was not in fact required. He also believed that he should have conducted a short field landing, retracted the flaps and applied heavy braking immediately after touchdown as stated in the POH.
- **QNH**: The pilot reported that the forecast area QNH[4] was selected on the aircraft's altimeter at the time as the actual local QNH[5] for Innamincka was not known. The pilot stated that this may have affected his circuit altitude if the area and local QNH were different.
- **Airstrip information**: The pilot reported that he could have contacted the pilot of the preceding aircraft, who had landed shortly before MMN, to obtain the local QNH and gain a more accurate assessment of the wind conditions on the ground. The pilot of MMN was also advised by other pilots after the accident that they had considered the wind conditions to be difficult.
- **Go-around**: The pilot stated that one of the key lessons learnt from the accident was gaining an appreciation of the relationship between the operating conditions at the time and when to initiate a go-around.

Safety message

This accident demonstrates the importance of assessing the operational and environmental conditions at the time in order to determine the most suitable landing type. Pilots should also establish a decision point along the runway at which a go-around should be initiated if the requirements for a safe landing can no longer be met. Additionally, it highlights the benefits of using all available resources, including persons on the ground, for gathering information on the actual conditions. The following publications provide additional information on short field approaches and landings:

- http://flighttraining.aopa.org/students/maneuvers/skills/shortsoftlanding.html
- http://flighttraining.aopa.org/students/maneuvers/skills/shortapproach.html
- www.caa.govt.nz/fig/downloads/advanced-manoeuvres/short-field-takeoff-and-landing.pdf

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4 Altimeter barometric pressure subscale setting to provide altimeter indication of height above mean sea level in that area. The area QNH is representative of the QNH of any location within a particular area.

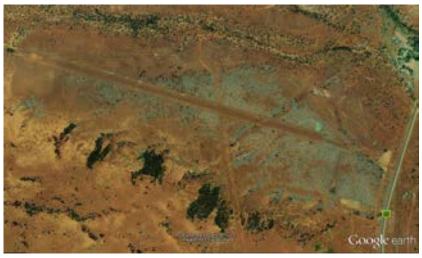
5 The local QNH would have provided a more accurate indication of the aircraft's operating altitude at Innamincka.

General details

Registration:	VH-MMN	
Manufacturer and model:	Piper Aircraft Corporation PA-39	
Type of operation:	Private	
Occurrence category	Accident	
Primary occurrence type:	Runway excursion	
Location:	Innamincka Township (ALA), South Australia	
	Latitude: 27° 44.50' S	Longitude: 140° 44.70' E
Persons on board:	Crew – 1	Passengers – 1
Injuries:	Crew – 1 (Minor)	Passengers – Nil
Damage:	Serious	

Wheels up landing involving Beech A36, VH-SQI

Kumarina Roadhouse airstrip



Source: Google earth

What happened

On 12 November 2012, a Beech A36 aircraft, registered VH-SQI (SQI), was conducting a fire inspection flight. On board were the pilot and one passenger.

At about 0525 Western Standard Time[1], the aircraft departed Meekatharra, Western Australia for Kumarina, where SQI conducted a 45 minute flight to observe nearby fires. At about 0850, the pilot and passenger prepared to depart Kumarina for further inspection of fires in the area. During the take-off run, the forward cabin door, located next to the passenger, opened and the pilot elected to continue the take-off. The passenger was slightly alarmed by the door opening, but the pilot reassured him that it was fine and that they would return and land.

The pilot elected to conduct a tighter and lower than normal circuit to expedite the landing, and decided to leave the aircraft in the take-off configuration to reduce his workload. He did however decide to retract the landing gear. During the shorter circuit, the pilot focused on locating a communications tower located north of the runway within the circuit area. The pilot commented that he felt overloaded and did not conduct his normal downwind and pre-landing checks as he believed the aircraft was already configured.

During the flare[2], the pilot realised he had not done his pre-landing checks and had forgotten to lower the landing gear. The aircraft landed with the wheels up and skidded to a halt about 200 m down the runway. The pilot and passenger were uninjured, however the aircraft was substantially damaged.

Neither the pilot nor passenger reported hearing the landing gear warning horn. The pilot stated this may have been due to the noise from the open door and his focus on flying the aircraft.

Pilot comments

This was the pilot's first flight into Kumarina, however he stated he had been well briefed on the local area by his company Chief Pilot.

The pilot reported briefing his passenger on emergency procedures and the door locking procedure on the previous sectors. On the accident flight, he watched the passenger close and lock the door, and checked it before take-off. He also reported that the aircraft type familiarisation training included practice with the door being opened during take-off and he was aware of the difficulty and danger of attempting to close the door in flight.

In addition, the pilot reported that the following factors may have contributed to the accident:

- **Fatigue:** The pilot had flown a scenic flight in a fixed gear aircraft in the morning the day before the accident and then departed on the charter in SQI later that afternoon. Due to approaching last light, they had overnighted in Meekathara. The pilot commenced duty at 0400 on the accident day, and reported some level of fatigue throughout the day.
- **Workload:** The pilot commented that the workload of handling an abnormal situation, his concern about the passenger, a potential obstruction in the circuit, and his decision to rush the

[1] Western Standard Time (WST) was Coordinated Universal Time (UTC) + 8 hours
[2] Final nose-up pitch of landing aeroplane to reduce rate of descent close to zero at touchdown

circuit all contributed to him not realising until the flare that he had neglected his downwind and final pre-landing checks. These checks include lowering and confirming the position of the landing gear.

Figure 1: VH-SQI

Source: Pilot

Safety message

Transport Canada and the Transportation Safety Board of Canada have conducted research which found a number of aircraft accidents occurred after a cabin, baggage or other compartment door opened in flight or during takeoff in small twin (eg Cessna 404) and single engine aircraft (eg A36). In particular, the research indicated that all 33 aircraft in the study were capable of controlled flight with the door open. However "the distraction, pre-occupation, channelized attention, panic, etc. associated with a door opening in flight apparently affected 17 of the accident pilots to such an extent that aircraft control was significantly degraded." This degradation led to outcomes such as stalling, landing hard or with the gear up, flying into an object or the ground and loss of control while attempting to close the door. In 11 of these 17 accidents, the pilot-in-command had over 500 hours total flying time.

Most small aircraft which feature in these statistics do not have either a secondary door latch or any "door open" warning device to alert the pilot. For this reason the report encourages operators to prepare pilots for these types of events with a pre-determined plan of action. It also recommends adequate training be introduced at the ab-initio level of pilot training, and be included in recurrent training opportunities.

Transport Canada and Transport Safety Board research and recommendations regarding in-flight opening of doors on small aircraft can be found at:

- www.tc.gc.ca/eng/civilaviation/opssvs/air-tsb-1993-a92p0191-a92p0191_synopsis-524.htm
- www.tc.gc.ca/eng/civilaviation/opssvs/air-tsb-1993-a92p0191-a92p0191_p2-558.htm

In light of this research, CASA produced the following Airworthiness Bulletin:

- www.casa.gov.au/wcmswr/_assets/main/airworth/awb/52/002.pdf

The ATSB research report *Dangerous Distraction* examined the effect of distractions in aviation accidents and incidents from 1997 – 2004. Sources of distraction included flight management tasks, external objects and people on board the aircraft.

- The report identified 18 (7.3%) of the 247 occurrences in the study where having persons of board contributed to pilot distraction.
- External events including objects on the ground, contributed to pilot distraction in 6 (2.4%) occurrences.

The report is available at:

- www.atsb.gov.au/publications/2005/distraction_report.aspx

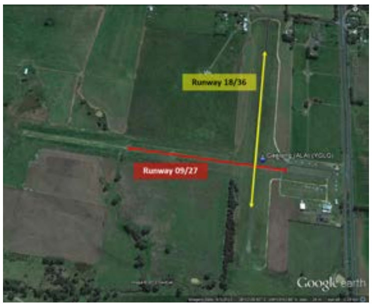
General details

Registration:	VH-SQI	
Manufacturer and model:	Beech Aircraft Corporation A36	
Type of operation:	Aerial Work – Fire Spotting	
Occurrence category:	Accident	
Primary occurrence type:	Wheels up landing	
Location:	Kumarina Roadhouse airstrip, Western Australia	
	Latitude: 24° 42.73' S	Longitude: 119° 35.89' E
Persons on board:	Crew – 1	Passengers – 1
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Substantial	

Landing on a closed airstrip involving a Piper PA-28R, VH-HKZ

What happened

Geelong (Grovedale) airstrip



Source: Google earth

On 17 November 2012, a Piper PA-28R aircraft, registered VH-HKZ, was prepared for a private flight from Bairnsdale to Geelong (Grovedale), Victoria.

The pilot obtained the weather forecast for the flight and submitted a flight plan to Airservices Australia. The aircraft then departed Bairnsdale with the pilot and a passenger on board.

During the cruise, the pilot heard broadcasts from aircraft operating at Barwon Heads and Torquay. The pilot also reported broadcasting several calls advising of his intention to land at Geelong, with no responses received.

When approaching Geelong, the pilot noted cloud at about 2,500 ft overhead the airstrip. He also began to feel apprehensive as he had not heard any broadcasts for aircraft operating at Geelong, but believed that the cloud may have been a deterrent.

On arrival at the airstrip (Figure 1), the pilot observed flags adjacent to the powerlines on the approach to runway 27. At the time, he believed that the flags may have been installed for increased awareness due to a wirestrike accident that occurred in 2010. Subsequently, the aircraft joined the downwind leg of the circuit for runway 18.

The pilot noted there were no aircraft visible on the ground, but did observe a number of cars and umbrellas. He suggested to his passenger that they should possibly divert to Barwon Heads. However, the pilot reported that he was not prepared for conducting a landing at Barwon Heads, nor was it the most appropriate runway suitable under the given wind conditions. Consequently, and as he was more familiar with Geelong, he decided to continue. As a precaution, he elected to overfly the runway. Both the pilot and passenger examined the runway for any visible markings (cross markers) to indicate the airstrip was closed, but none were sighted. The pilot did, however, observe a light coloured section near the northern end of runway 18/36. Overall, the pilot reported that the runway appeared the same as it had on previous occasions.

A second circuit was conducted, during which the pilot and passenger inspected the condition of the runway and the aircraft was landed on runway 18.

After landing, the pilot noticed that the office buildings were unoccupied and a fence had been placed across runway 09/27. The pilot and passenger exited the aircraft and were subsequently advised by people on the ground that the airstrip had been closed and was being redeveloped. The pilot then contacted Airservices Australia via telephone to cancel his SARTIME[1]; in acknowledging the cancellation, the Airservices employee made reference to Barwon Heads as the planned destination.

After returning to Bairnsdale, the pilot noted that he had a message on his home phone and mobile from Airservices Australia advising that Geelong was closed and his flight planned destination had been changed to Barwon Heads.

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[1] Time nominated by a pilot for the initiation of Search and Rescue action if a report from the pilot has not been received by the nominated unit.

Airstrip information

The Geelong (Grovedale) airstrip was an uncertified, unregistered aeroplane landing area (ALA), located about 3 NM to the north of the Geelong Township. The airstrip, which had been operating for about 40 years, had two runways aligned 180°/360° and 090°/270°. The airstrip was privately owned and operated.

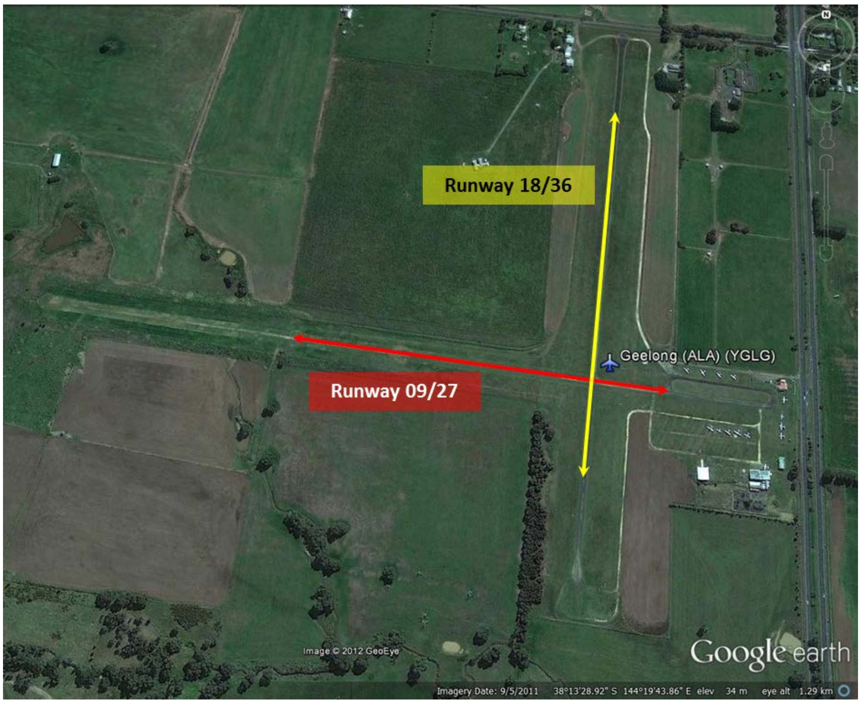
On 25 September 2010, a Rockwell International 114 aircraft, registered VH-CSH (ATSB investigation AO-2010-071) collided with high voltage powerlines while conducting an approach to runway 27. As a result of that accident, operations at Geelong were restricted and the airstrip was closed to visiting aircraft. The airstrip was initially scheduled for complete closure in June 2011; however, the lease was extended. The airstrip was subsequently closed in April 2012 for re-development as a residential estate.

The Aeronautical Information Publication AD 1.1 paragraph 4, subparagraph 3.3.2 stated that:

> When an aerodrome that does not have 24 hour ATC [air traffic control] coverage is completely unserviceable for all operations, an unserviceability cross marker is displayed in the signal circle[2].

The pilot reported that neither he nor the passenger observed any markings on the runway to indicate the airstrip was closed. The pilot did, however, observe a marking at the northern end of runway 18/36. Prior to departing Geelong, the pilot visually inspected the runway and noted that the marking was a large square or rectangle covering the width of the runway, and was of a powder-like substance. The pilot could not recall sighting the windsock.

Figure 1: Geelong (Grovedale) airstrip



Source: Google earth

Pre-flight preparation

In preparation for the flight, the pilot looked at a number of potential landing areas including Barwon Heads and Geelong. The pilot initially referenced the En Route Supplement Australia (ERSA) and noted that there was airstrip information for Barwon Heads, but not Geelong. The pilot then referred to the Aircraft Owners and Pilots Association of Australia (AOPA) National Airfield Directory 2010/11 to obtain runway information for both airstrips.

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2 The signal circle is coloured circular area located near the windsock for displaying ground signals to pilots.

The pilot reported that the weather forecast indicated moderate to strong westerly winds in the afternoon. He determined that the length of the east-west runway at Barwon Heads may be insufficient under these conditions and consequently, selected Geelong as the destination. The AOPA Directory also stated that permission was required to operate at Geelong.

After the incident, the pilot referenced the Directory again and then noted that permission was required. The pilot stated that, in general, he contacts an airstrip operator to request permission and to gain an appreciation of the runway/s. He further stated that, if he had contacted the Geelong operator and received no response, he would have likely selected Barwon Heads.

The latest edition of the AOPA Directory (2012) was released at about the same time the incident occurred. That edition stated that the Geelong (Grovedale) airstrip was closed.

Pilot comment

The pilot reported that he had concerns with landing at Geelong when no aircraft were observed on the ground. However, as the runway appeared normal, with no cross markers sighted, the pilot elected to continue. The pilot further stated that he felt comfortable and familiar with landing at Geelong, which may have supported this decision.

Safety message

Before commencing a flight, the pilot in command should review all available information appropriate to the intended operation, including current weather reports and forecasts, and the condition and suitability of the selected landing area/s.

Furthermore, Civil Aviation Safety Authority Advisory Circular AC 91-225(0)[3] stated that:

> There is ownership and management of almost every potential landing place, with the possible exception of open areas of water. Unless a landing place is unambiguously open to public use for aviation the pilot should assume that approval is required before using land or water for an aircraft movement.

This incident highlights the importance of reviewing flight information in its entirety, ensuring that operational documents are current, and the benefits of contacting the airstrip operator to not only obtain landing permission, but to also receive information on the runway and its condition, any hazards and/or obstructions, and if there are any special procedures applicable to the airstrip.

General details

Registration:	VH-HKZ	
Manufacturer and model:	Piper Aircraft Corporation PA-28R-201T	
Type of operation:	Private	
Occurrence category:	Serious incident	
Primary occurrence type:	Runway events	
Location:	Geelong (Grovedale), Victoria	
	Latitude: 38° 13.50' S	Longitude: 144° 20.98' E
Persons on board:	Crew – 1	Passengers – 1
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

[3] www.casa.gov.au/newrules/parts/091/download/ac091-225.pdf

Helicopters

Ditching involving Robinson R44, VH-CYH

What happened

On 9 June 2012, a Robinson R44 helicopter, registered VH-CYH (CYH), departed Thursday Island to Dauan Island, Queensland (Figure 1), on a charter passenger flight with one passenger. The pilot had submitted a flight plan, with a nominated SARTIME[1] of 1800 Eastern Standard Time[2].

During the flight, the alternator light illuminated on two separate occasions. The pilot turned the alternator off and then back on and the light extinguished on both occasions.

When at Dauan Island, the pilot attempted to start the engine for the return flight, however, he reported that the engine rotated several times and then a clicking sound was heard 'like a battery without enough power'. After consultation with the operator, truck batteries were used to start the helicopter. The engine was run at idle power for about 10 minutes before the helicopter departed for Horn Island at about 1700, with only the pilot on board.

About 10 minutes after departing, the alternator light illuminated. The pilot turned the alternator off and back on again and the light went out. Shortly after, the alternator light illuminated again, the pilot turned the alternator off and back on again and the light went out. This happened twice again in quick succession before the pilot then isolated all non-essential electrical systems and, as he had passed the point of no return[3] to Dauan Island he elected to fly to Moa Island.

About 10 minutes later, the pilot heard a high 'revving' sound and the engine governor failed[4]; the pilot switched the governor off. The pilot also noted that the engine and main rotor tachometer indicators were reading higher than normal. In response, the pilot manually reduced the engine revolutions per minute (RPM). The pilot became concerned that the high engine and main rotor RPM may have resulted in a main rotor transmission overspeed. As a precaution, the pilot descended the helicopter to 500 ft above the water, so that he could better assess the helicopter's height above the water in the event of an emergency.

Over the next 10 minutes, the pilot adjusted the throttle manually to manage the engine and rotor RPM which would stabilize for a few minutes and then indicate a reduction. The engine manifold air pressure increased each time the throttle was adjusted and the pilot made adjustments to maintain the manifold air pressure within the normal range. This was coupled with a gradually increasing vibration and grinding noise. When at about 300 ft above the water, the pilot deployed the emergency 'pop-out' floats. The pilot was concerned about the increase in engine noise and vibration and elected to descend and commence a hover taxi. Soon after, the throttle was not able to be adjusted further and the manifold air pressure continued to rise, and he elected to ditch the helicopter.

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1 A SARTIME is nominated by a pilot for the initiation of Search and Rescue action if a report from the pilot has not been received by the nominated unit. SARTIMEs are managed on a national basis by the central SARTIME management database, CENSAR.

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

3 Point of no return is the geographic position on track or time at which fuel remaining becomes insufficient for aircraft to return to starting point.

4 The governor maintains engine RPM by sensing changes and applying corrective throttle inputs through a friction clutch, which can be overridden by the pilot. If the governor malfunctions, the pilot is required to grip the throttle firmly to override the governor, then switch the governor off. The flight is then completed using manual throttle control. The governor operates on 14 volts supplied via a voltage regulator and ceases operation when the battery voltage decreases below 10 volts.

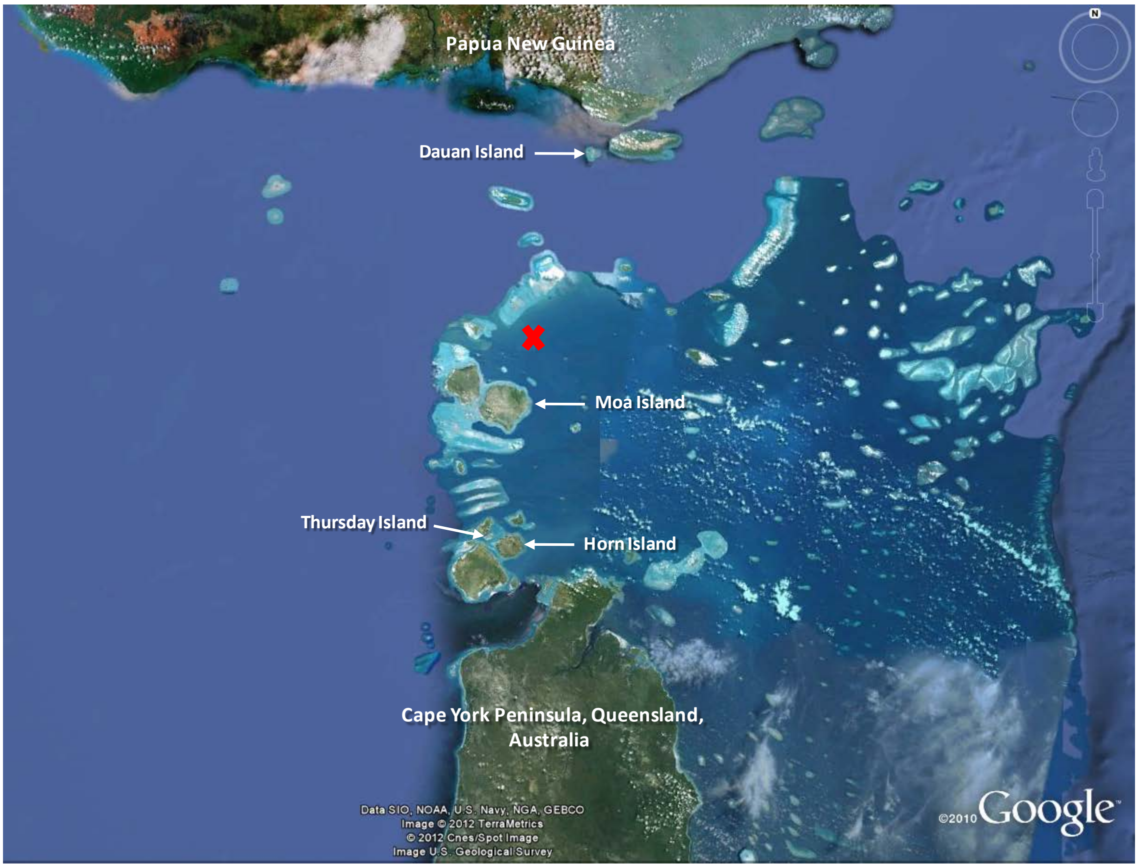
CHY was landed in 1 m of swell and remained upright. The pilot shut down the helicopter and remained in the cockpit, as conditions at that time were considered reasonably stable. The pilot, who was wearing a life jacket, activated his personal locator beacon (PLB).

The pilot attempted to contact the Horn Island police on his mobile phone, but the signal dropped out. The pilot then contacted the helicopter operator using his mobile phone, who initiated a search and rescue operation by contacting the Rescue Coordination Centre Australia (RCC)[5]. Shortly after, the signal from the PLB was detected by the Cospas-Sarsat system[6] and an automatic alert was generated and provided to the RCC.

At about 1800, CENSAR[7] contacted the pilot via mobile phone to advise that the SARTIME for CYH had expired.

At about 1845, a search and rescue helicopter arrived and transported the pilot to Horn Island. The pilot was uninjured, however the helicopter sustained substantial damage as a result of exposure to the salt water. The helicopter was recovered the next day.

Figure 1: Horn Island area showing the approximate location of ditching (red cross)



Source: *Google Earth*

Pilot comments

The pilot reported that the crew of the search and rescue helicopter navigated to him using the flares that he had discharged until the helicopter was visible as they were not able to determine an accurate location from the PLB signal as it remained within the helicopter fuselage

5 The search and rescue service is provided by the Rescue Coordination Centre Australia (RCC), the national search and rescue organisation, which is part of the Australian Maritime Safety Authority (AMSA).

6 The Cospas-Sarsat System comprises distress beacon receivers on orbiting satellites. A network of ground receiving stations receives the satellite transmissions and sends the information to the RCC.

7 CENSAR is an automated centralised SARTIME database software package used by Airservices to manage SARTIMEs (AIP Australia GEN 2.2 – 5).

The pilot reported that he had been using a noise-cancelling headset on the flight, which may have dampened the abnormal engine sounds. Consequently, he only became aware of the engine problems when the governor failed.

The pilot reported that ditching training undertaken in 2008 had prepared him for the water landing. The pilot also stated that the mobile phone signal in that area was intermittent and he had to turn his phone off at times to conserve battery power.

Helicopter inspection

A detailed examination of the helicopter following the accident determined that the engine number 4 cylinder exhaust valve stem cap had dislodged from its normal location and the engine cooling fan wheel had rotated 180^0 on the fan shaft assembly. This was reported to be consistent with an engine overspeed. The battery voltage, which was normally 24 volts, was measured as 10.5 volts.

R44 electrical systems

The R44 helicopter has a 28 volt electrical system. The dual engine/main rotor tachometer indicator operates electrically on 14 volts supplied via a voltage regulator. The helicopter manufacturer indicated that the dual-tachometer would under-read as the supplied voltage decreases. That is consistent with what the pilot observed. The engine oil temperature, oil pressure and cylinder head temperature gauges are also controlled electrically and will also under-read as the supplied voltage decreases below 21 volts. However, the manifold absolute pressure (MAP) gauge operates on pressure and will remain accurate irrespective of the electrical system status. The helicopter manufacturer indicated that a higher than normal MAP indication along with excessive engine noise and vibration are very reliable indications of an engine overspeed condition.

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

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

- The lanyard on the PLB has been extended from 0.5 m to 3 m allowing the PLB to be thrown clear of the helicopter.
- Company policy has been amended in relation to a flat battery and faulty alternator, requiring immediate replacement.
- Pilots have been briefed in the use of noise cancelling headsets.
- A safety management program is being developed to monitor the reliability of helicopter components, to determine an appropriate time in service.

Safety message

This accident demonstrates the safety benefit of having a life jacket that was worn and equipped with flares and a PLB among other safety items.

A nominated realistic SARTIME provided another layer of safety, particularly if the pilot’s mobile telephone was not available.

This accident also demonstrates the benefit of a thorough knowledge of an aircraft’s systems. Low voltage from a failing battery led to the gauges for the engine/main rotor tachometer indicator under-reading. The noise cancelling headset worn by the pilot may also have masked changes in the ‘normal’ sounds of the helicopter[8].

The pilot had undergone helicopter underwater escape training[9] and stated it gave him the knowledge and confidence to prepare for a water landing and a possible submersion.

General Details

Manufacturer and model:	Robinson Helicopter Co R44 II	
Registration:	VH-CYH	
Type of operation:	Charter – test and ferry	
Occurrence category	Accident	
Primary occurrence type:	Abnormal engine indications	
Location:	83 km N of Horn Island airport, Queensland	
	Latitude: 09° 58.57' S	Longitude: 142° 21.23' E
Persons on board:	Crew – 1	Passengers – 0
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Substantial	

[8] CASA Airworthiness Advisory Circular (AAC) 1-43 Noise Isolating Headsets www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_90691 .

[9] Flight Safety Australia magazine September-October 1999, Sink or Swim, p 38, 39 www.casa.gov.au/wcmswr/_assets/main/fsa/1999/sep/huet.pdf .

Power loss involving Robinson R44, VH-NWD

What happened

VH-NWD

Source: Aircraft owner

On 11 October 2012, at 0845 Eastern Standard Time[1] a Robinson R44 Raven 1 helicopter departed a property near Mount Molloy for Georgetown, Queensland, on a private flight. On board the helicopter were the pilot and one passenger.

The pilot performed his usual pre-takeoff checks which included a check of the magnetos, with nothing unusual noted. The helicopter departed to the west from an elevated position located on a spur of a hill.

About 30 seconds after becoming airborne and as the helicopter passed through 250 ft and 60 knots indicated airspeed, the pilot heard a loud grinding noise from the rear of the helicopter. This noise was immediately followed by the illumination of the clutch light[2] and an uncommanded left yaw.

The pilot immediately executed a 180^{o} turn to the left, in an attempt to return to the clear area from which the helicopter had become airborne. As the pilot rolled out of the turn, the low Revolutions Per Minute (RPM) light and warning horn activated and he reported that the helicopter “kicked” three times to the left. The pilot lowered the collective[3] and entered autorotation[4] in an attempt to recover the rotor RPM.

The low RPM light and horn deactivated and the pilot autorotated towards the only clear, level area within autorotative distance; a contour drain located down a slope from the departure point.

At about 30 ft above ground level, the low RPM horn and light reactivated. The pilot initiated a flare[5] and increased the collective to its upper limit in order to utilise the remaining rotor RPM to cushion the landing. The helicopter touched down nose-high, on the heels of the skids with substantial forward momentum. The helicopter tipped forward and up onto the toes of the skids and the main rotor severed the tail boom. The helicopter came to rest straddling a contour drain and remained upright with the engine still running. The pilot shut down the helicopter and together with the passenger exited the helicopter without injury.

Weather

The pilot reported the weather as fine at 5 knots from the north-east.

Pilot information

The pilot held a Private Pilot Licence (Helicopter) with approximately 100 hours total time and 43 hours on the R44.

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

[2] Indicates clutch actuator circuit is on, either engaging or disengaging clutch.

[3] 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.

[4] Descent with power off, air flowing in reverse direction upwards through the lifting rotor(s) causing it to continue to rotate at approximately cruise RPM. Pilot preserves usual control functions through pedals, cyclic and collective, but cannot alter steep ‘glide path’. The rate of descent is reduced just before ground impact by an increase in collective pitch; this increases lift, trading stored rotor kinetic energy for increased aerodynamic reaction of the blades, and should result in a gentle touchdown.

[5] Final nose up pitching of landing helicopter to reduced rate of descent and forward airspeed to close to zero.

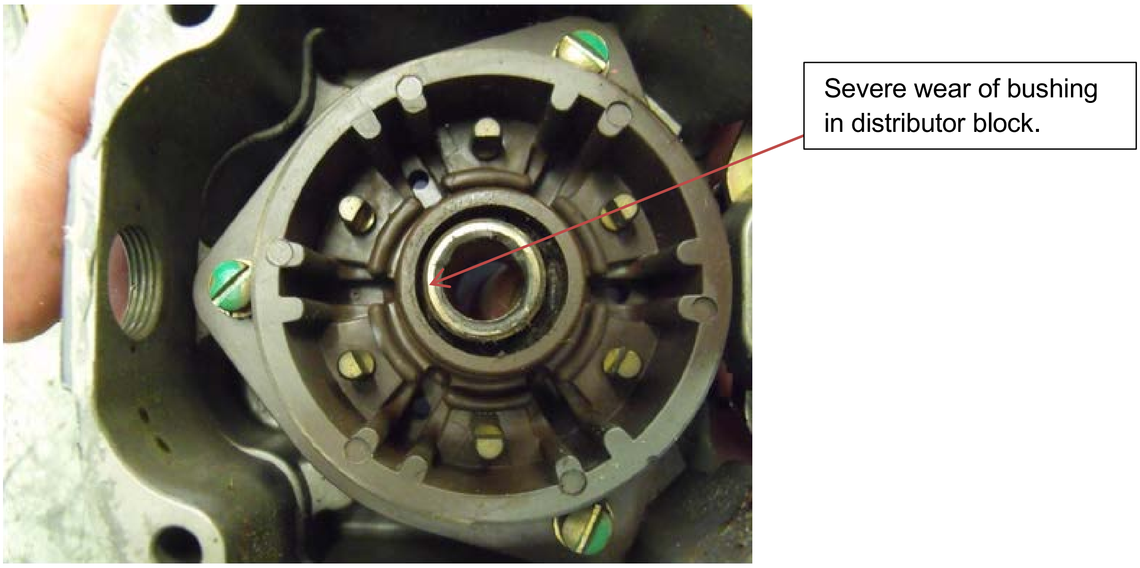
Helicopter history

The maintenance records indicated that the helicopter was serviceable and had flown a total of 174 hours at the time of the accident. A 100-hourly inspection had been performed approximately 70 flight hours prior to the accident and all the engine cylinders were found to be glazed and were replaced. The carburettor was found to be providing an overly lean mixture and was also replaced, with another brand of carburettor. On 15 August 2012, a 50-hourly inspection was performed with no defects noted. The aircraft had flown 19.9 hours since the performance of the 50-hourly inspection.

Engine examination

The aircraft was transported by the insurer to a contracted maintenance organisation for inspection. The magnetos were removed, inspected and checked for timing. The right magneto timing was found to be correct. The timing gear on the left magneto was found to be worn with a large amount of play. On disassembly, the left magneto was found to have a badly worn distributor block, which allowed the timing gear to move and alter the internal timing by approximately 40^0.

Figure 1: Left magneto distributor block



Source: Insurer

Safety message

Every take-off is unique and will require a different course of action in the event of a malfunction. Pilots are encouraged to perform a self-briefing prior to each take-off. Self-briefing is important, as it serves as a reminder in the event of an emergency, such as a complete or partial power loss.

Also, having made a plan prior to an emergency situation may mitigate some effects of decision making under stress, such as reduced short term memory. Further, knowing that you have made a plan under non-stressful and controlled conditions, should give you the confidence to carry out the required actions in an emergency situation.

For further information on what a pre-take-off brief should take into account see:

- ATSB Avoidable Accident booklet: Managing partial power loss after take-off in single-engine aircraft.

  www.atsb.gov.au/publications/2011/partial-power-loss.aspx

General details

Manufacturer and model:	Robinson R44 Raven 1	
Registration:	VH-NWD	
Type of operation:	Private	
Occurrence category:	Accident	
Primary occurrence type:	Mechanical	
Location:	38 km north west Cairns Airport, Queensland	
	Latitude:16°40'13.33 S	Longitude: 145°28'21.15 E
Persons on board:	Crew – 1	Passengers – 1
Injuries:	Crew – 0	Passengers – 0
Damage:	Substantial	

Hard landing involving Cabri G2, VH-CDU

What happened

Guimbal Cabri G2

Source: Helicopter operator

On 25 October 2012, at about 1510 EDT[1] a Hélicoptères Guimbal Cabri G2 (Cabri G2) helicopter, registered VH-CDU (CDU), landed heavily at Bankstown Airport, New South Wales. On board the helicopter were an instructor and a student pilot.

The purpose of the flight was to demonstrate the recovery procedure from various emergencies in the hover, including engine failure, loss of yaw control and low main rotor revolutions per minute (RPM).

A short briefing was performed by the instructor and at 1445 CDU departed for the western grass helicopter training area at Bankstown Airport. The instructor commenced the lesson by demonstrating a number of jammed pedal exercises and the recovery procedure. The instructor then proceeded to demonstrate a low main rotor RPM[2] situation and the recovery procedure.

The instructor reported that it was his usual practice to initiate the low RPM situation by overriding the governor[3] and winding the throttle[4] closed slightly to reduce the main rotor RPM to about 95% RPM[5] (513 RPM). However, in this case he could not recall specifically what value the RPM was reduced to, but considered that it was less than 95%. As a result, the helicopter began to rotate to the left at a high rate. The instructor stated that he opposed the rotation with full right pedal[6] however this had no effect on the rate of rotation.

The instructor was unable to maintain the position of the helicopter with the cyclic control, due to the rate of rotation, and the helicopter drifted towards the airport boundary fence. The instructor stated that the speed of rotation started to decrease, however the boundary fence was approaching rapidly. He elected to put the helicopter on the ground rather than see if he could arrest the rotation.

The helicopter landed heavily and remained upright. A further three rotations occurred on the ground before the helicopter came to rest with the tail about 60 cm from the fence. The instructor and student were able to exit the helicopter without injury. There was minor damage to the helicopter as a result of the incident.

Weather

The METAR[7] issued for Bankstown Airport around the time of the incident reported the weather to be fine and the wind as:

- 030° at 8 knots, at 1430

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[1] Eastern Daylight-savings Time (EDT) was Coordinated Universal Time (UTC) + 11 hours.
[2] Low rotor RPM is a product of insufficient engine power relative to the engine power required. A lack of engine power can be due to a number of reasons including complete engine failure, a partial power loss, the ambient conditions or pilot technique.
[3] The governor is designed to assist in keeping the rotor RPM constant at flight RPM. The governor maintains the engine RPM by sensing changes and applying corrective throttle inputs through a friction clutch which can be overridden by the pilot.
[4] The throttle is situated on the end of the collective and is operated by a twist grip.
[5] Flight RPM of 100% is 530 RPM.
[6] The anti-torque pedals control yaw about the yaw axis by simultaneously varying pitch on the shrouded tail rotor blades.
[7] Routine aerodrome weather report issued at fixed times, hourly or half hourly

- 060° at 12 knots, at1500
- 060° at 13 knots, at 1530

The pilot reported that the wind at the time of the accident was gusting to 20 knots[8].

Pilot information and comments

At the time of the accident, the instructor held a Commercial Pilot (Helicopter) Licence and a Grade 1 Instructor Rating. The instructor had about 7,500 hours helicopter experience with about 300 hours on the Cabri G2.

The student had approximately 40 hours total time, all on the Cabri G2.

The instructor commented that it was his understanding that the Civil Aviation Safety Authority (CASA) had recommended and required low RPM awareness training be conducted in all helicopter types including the Cabri G2.

The instructor commented that he could not recall what initiated the rotation but considered it may have been as a result of;

- raising the collective or
- his hand may have slipped on the throttle allowing the governor to suddenly open the throttle.

Aircraft information

The Guimbal Cabri G2 is a two-seat helicopter manufactured in France. It features a 3-bladed main rotor which rotates clockwise when viewed from above. The torque produced by the main rotor causes the fuselage of the helicopter to rotate in the opposite direction (nose left in this case). The anti-torque system comprises a 7-bladed shrouded tail rotor [9] in place of a conventional tail rotor. The shrouded tail rotor provides thrust, which counteracts the main rotor torque and provides directional control while hovering.

Manufacturer comments

The main rotor of the Cabri has a high inertia, with a t/k criteria[10] of 1.6 seconds, compared to other helicopters in a similar category where a figure between 0.8 and 1.1 seconds is common. At 85 per cent RPM (450 RPM) the main rotor produces the maximum amount of lift. That is the main rotor initially produces more lift as the RPM is reduced below the normal flight RPM (at100 % or 530 RPM).

Both the European Aviation Safety Agency (EASA) and the US Federal Aviation Administration (FAA) certification requirements are that the helicopter (in this category) can be controlled in yaw with a 17 knot wind from every direction at the maximum gross weight for the density altitude and at the minimum powered rotor speed (515 RPM or 95% in the Cabri G2). The Cabri G2 exceeds the certification requirements and has demonstrated that yaw can be controlled at a main rotor speed as low as 85 % RPM (450 RPM) in nil wind conditions (Figure1). Following the incident, the helicopter manufacturer examined CDU and considered that the main rotor RPM was likely between 70 and 75 % when CDU contacted the ground.

The electronic RPM governor in the Cabri controls the rotor speed within a maximum variation of +/- 3 %. It is possible to override the governor and lower the main rotor speed below the minimum controllable value of 85 % (Figure 1) while demonstrating low rotor speed in a hover. Increasing the torque in order to recover the rotor RPM in this situation may exceed the anti-torque capability of the shrouded tail rotor.

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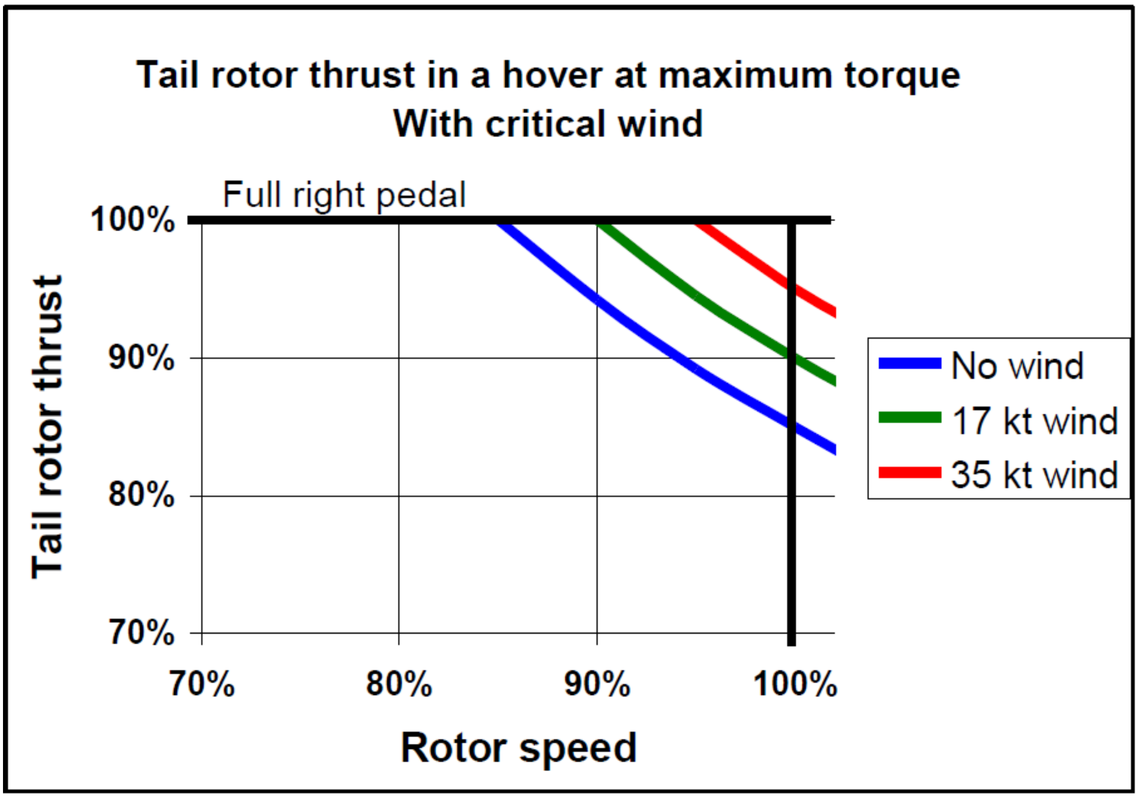
8 Maximum wind speed is only reported when the maximum wind speed is 10kts or more than the mean wind speed.

9 Helicopter tail rotor with numerous blades rotating in a short duct inset into the fin.

10 t/k criteria is the standard by which the auto rotational ability is measured. It is calculated by dividing the useable rotor inertia (to rotor stall) by the power required to hover. t/k provides an indication of the time to land (in a hover) or time to enter autorotation (in cruise) after an engine failure at full power.

The Cabri G2's high main rotor inertia will make the yaw departure to the left comparatively quick. Moreover, if the governor is not turned off for the manoeuver, the governor will react quickly in the event the pilot stops overriding it, contributing to the speed of departure in yaw to the left. The manufacturer commented that practising low main rotor RPM recovery in ground effect or at low altitudes poses an unnecessary risk and is not warranted in the Cabri G2 when a similar manoeuvre could be practised safely above 1000 ft above ground level. Such a manoeuvre at low altitude is not described or recommended in the aircraft flight manual.

Figure 1: Tail rotor thrust margin versus rotor speed at maximum torque



Source: *Hélicoptères Guimbal*

ATSB comment

In 1995, the US FAA responded to the issue of a failure to recognise the onset of settling with power, low rotor RPM and over-pitching in low speed operations in the Robinson R22 and R44 helicopter types by issuing Special Federal Aviation Regulation (SFAR) No.73. This regulation mandated annual awareness training, minimum aeronautical experience and flight review for pilots of the R22 and R44 helicopters.

ATSB report AO-2008-062, *Collision with terrain, 6 km NE of Purnululu ALA, Western Australia, 14 September 2008*, identified a safety issue with the Australian helicopter training syllabus. The issue identified was that there was no Australian requirement for endorsement and recurrent training conducted on Robinson R22/R44 helicopters to specifically address the preconditions for low rotor RPM or the recovery procedure. The report is available at:

- www.atsb.gov.au/publications/investigation_reports/2008/aair/ao-2008-062.aspx

CASA responded to the safety issue raised by the ATSB and recommendations of the WA Coroner and conducted a flight training meeting with industry helicopter Chief Flying Instructors (CFI) and Authorised Testing Officers (ATOs) in May 2011. This meeting specifically discussed the R22 and R44 and SFAR No.73. However it was recommended that a project to amend Civil Aviation Order (CAO) 40.3.0 be initiated to incorporate awareness training for any light single engine helicopter identified as an at risk type for the relevant key hazards contained in SFAR No.73.

On 19 December 2011, CASA approved project; OS 11/52 to include the requirement for Awareness Training to be conducted as part of endorsement for initial pilot training and endorsement and recurrent training on all helicopters identified as an at risk type. This would include a review of the Helicopter Flight Instructors Manual.

- Project OS 11/52 is available at: www.casa.gov.au/scripts/nc.dll?WCMS:PWA::pc=PC_100815

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.

Manufacturer

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

- A service letter (SL) is being prepared intended to help prevent inappropriate training procedures for the helicopter type.

Safety message

This accident highlights that different helicopter types have their own specific handling characteristics and that pilots should be familiar with the emergency procedures prescribed by the helicopter manufacturer’s flight manual and the immediate actions to be performed to ensure a successful outcome.

The following publications provide useful information;

- ATSB investigation: Guimbal Cabri G2, VH-ZZT www.atsb.gov.au/publications/investigation_reports/2012/aair/ao-2012-055.aspx
- BFU Investigation: BFU 3X036-10: Guimbal Cabri G2 www.bfu-web.de/nn_223970/DE/Publikationen/Untersuchungsberichte/2010
- AAIB Investigation: Guimbal Cabri G2, G-UIMB www.aaib.gov.uk/publications/bulletins/march_2012/guimbal_cabri_g2__g_uimb.cfm

General details

Manufacturer and model:	Hélicoptères Guimbal Cabri-G2	
Registration:	VH-CDU	
Type of operation:	Flying training	
Primary occurrence type:	Hard landing	
Location:	Bankstown airport, New South Wales	
	Latitude: 33° 55.47' S	Longitude: 150° 59.30' E
Persons on board:	Crew – 2	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Minor	

Controlled flight into water involving Robinson R22, VH-HOA

What happened

On 31 October 2012, a Robinson R22 helicopter, registered VH-HOA (HOA) was being used to conduct mustering operations at Innamincka Station, South Australia. The pilot was the only person on board.

The helicopter commenced operations at about 0730 CDT[1], with the pilot returning to base camp for fuel and refreshment breaks throughout the day. The pilot reported that, due to operating at low-level over the sandy and swampy terrain, the windscreen was dirty, leading to poor visibility. During one break, water was poured over the windscreen to clean it, however the pilot reported that the visibility did not improve.

The pilot reported that the weather was 38^{0} C, with no cloud and minimal wind.

At 1415, HOA departed base camp for its final mustering run of the day. The helicopter and ground personnel were moving cattle in a northerly direction. As the cattle moved slowly along a narrow neck of land, east of Lake Marradibbadibba, the pilot looked for stray cattle by flying an east-west grid pattern, well behind the main herd.

At about 1520, HOA was traveling west at 60-70 kts between 120-150 ft above the ground. With about 19 inches of manifold pressure, the pilot conducted a turn to the east, over the edge of the lake. A few seconds later, the helicopter collided with the water and sank rapidly into 8-10 ft of water. The pilot exited the helicopter without injury and swam to shore. However the helicopter was seriously damaged.

Due to his location, well behind the ground personnel moving the main herd of cattle, there were no witnesses to the accident.

Pilot comments

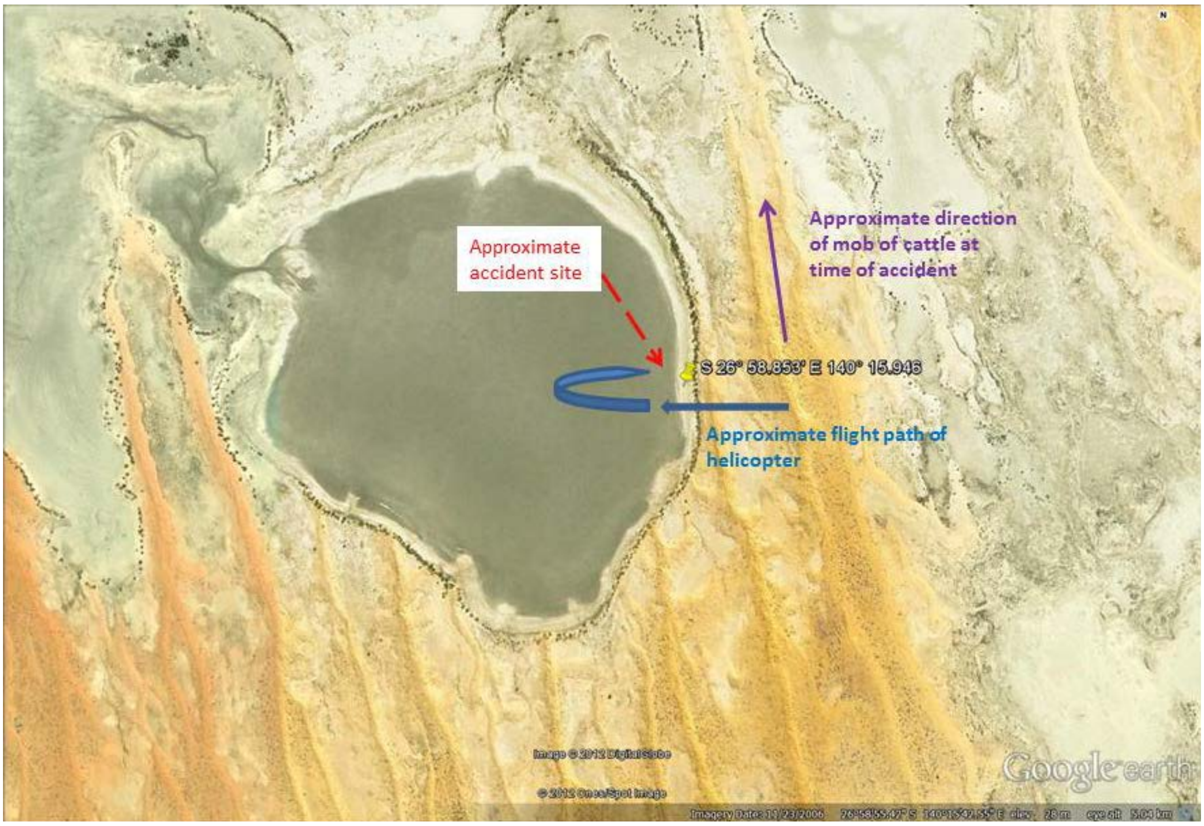
The pilot stated that even though he was wearing sunglasses, during the turn there was significant sun-glare from a reflection off the water. He reported becoming disoriented, due to the combination of the sun-glare and the dirty windscreen, and consequently did not detect the rate of descent.

Due to previous damage to the pilot's helmet, he was not wearing a helmet on the day.

The majority of the pilot's 3000 hours flying experience had been mustering operations in the R22.

[1] Central Daylight Time (CDT) was Coordinated Universal Time (UTC) + 10.5 hours.

Figure 1: Accident site – Lake Marradibbadibba



Source: Google Earth

Safety message

The effect of sun-glare when relying on visual cues is an important consideration for all pilots. The US Federal Aviation Administration (FAA) has conducted research into sunlight and its association with aviation accidents. This research found:

- 80 per cent of accidents where glare was a contributing factor occurred during daytime hours, rather than in the early morning or evening.
- In five per cent of the accidents, a dirty or damaged windscreen was an additional contributing factor.
- The majority of accidents occurred during flight manoeuvres at low altitude in airspace congested with other aircraft or obstacles.

The report suggests a number of preventative techniques to reduce the effects of sun glare including wearing sunglasses and ensuring the windscreen is clean. The research report is available at:

www.hf.faa.gov/docs/508/docs/cami/0306.pdf

In 2010, the ATSB investigated a collision with water involving a Cessna 172, VH-UFN over a lake in far western New South Wales. The investigation report noted the danger associated with flight operations overhead bodies of water when the surface is glassy (as in low or nil wind conditions). These conditions can lead to a difficulty in depth perception and effect a pilot's judgement of the aircraft's height above the surface. The report is available at:

www.atsb.gov.au/publications/investigation_reports/2010/aair/ao-2010-045.aspx

http://siimssharepoint/Aviation/investigation.aspx?investigation=AO-2010-045Although the pilot was uninjured as a result of this accident, previous ATSB investigations have shown the benefits of wearing a helmet. The following ATSB investigation provides additional information on helicopter safety helmets:

- AO-2012-016: Partial power loss - Schweizer 300C helcopter, VH-FUJ, 19 km south of Long Hill (ALA), Tasmania, 25 January 2012
  www.atsb.gov.au/publications/investigation_reports/2012/aair/ao-2012-016.asp

General details

Manufacturer and model:	Robinson R22	
Registration:	VH-HOA	
Type of operation:	Aerial work - mustering	
Primary occurrence type:	Controlled flight into terrain	
Location:	89 km NNW of Innamincka (ALA), South Australia	
	Latitude: 27° 01.13' S	Longitude: 140° 15.52' E
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	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.

ATSB Transport Safety Report

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