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Take-off without runway lighting involving Airbus A320, VH-JQG

What happened

Hobart Apron

Source: Hobart International Airport

At 2327 Eastern Daylight-saving Time[1] on 14 December 2012, an Airbus A320 registered VH-JQG (JQG) operated by Jetstar Airways on a scheduled passenger flight from Hobart, Tasmania to Melbourne, Victoria, took off without the runway lights being activated for the taxi and take-off roll.

Airport information and lighting

Outside tower hours, Hobart Airport operated as a non-towered, uncontrolled airport, operating on a common traffic advisory frequency (CTAF).[2] When operating as a CTAF, the runway lighting was controlled by a pilot-activated lighting (PAL) system that was combined with an aerodrome frequency response unit (AFRU).[3] To activate the lights, pilots were required to make a sequence of three transmissions on the CTAF. Each transmission was to have a maximum duration of 1 second, with the break between transmissions being a maximum of 1 second. On receipt of the appropriate transmission, the AFRU would broadcast an automatic message 'Hobart lights ON' on the CTAF.

Once the PAL system was activated, the airport lighting would remain on for 30 minutes. If it was reactivated during this period, the lighting would remain on for 30 minutes from the time of reactivation. At 10 minutes prior to the end of the 30-minute activation period, the wind indicator (windsock) lights would commence flashing to warn users that the airport lighting was about to extinguish. In addition, an automated message would be transmitted on the CTAF to state there was 10 minutes of runway lighting remaining. There was no indication that the system was malfunctioning on the night of the occurrence.

On the night of the occurrence, JQG was parked at gate 4 facing away from the runway and facing into the brightly lit terminal at Hobart Airport. The apron was brightly lit at night and the apron lighting operated independently of the PAL lighting system. Also, alternating flashing amber holding-point lighting operated independently of the runway PAL lighting system.

Aircraft lighting information

The exterior lighting of the A320 included several lights, which illuminated the ground in front of the aircraft. These included the landing lights, nose lights, taxi lights and runway turn-off lights. The combination of these lights provided a substantial amount of illumination in front of the aircraft.

Recorded information

Recordings of radio transmissions made on the CTAF, along with recorded video from a closed circuit television (CCTV) mounted on the passenger terminal, were reviewed by the ATSB. The CCTV video showed movement of the aircraft consistent with the audio recording of the CTAF. In addition, the lighting activation records were obtained from Hobart Airport, which confirmed that the aerodrome lighting was not activated for the departure of JQG.

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1 Eastern Daylight-saving Time was Coordinated Universal Time + 11 hours
2 A CTAF is a radio frequency designated for communications between aircraft in the vicinity of aerodromes without a control tower.
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.

Flight crew experience

The Captain had approximately 18,000 hours total flying experience and was a senior check captain with the operator.

The First Officer had approximately 10,000 hours total time and had recently joined the operator. The flight on 4 December was to serve as a final check to line for the First Officer.

Both pilots noted that it had been a number of years since they had operated from a CTAF at night utilising PAL.

Comments from flight crew

The crew had been delayed throughout the day which resulted in the aircraft arriving at Hobart two hours later than scheduled. Consequently, the Hobart Tower had been deactivated and operations were being conducted in accordance with the non-towered aerodrome procedures, which the crew had not originally planned for. The Captain also reported being cognisant of the fact that the delays earlier in the day had the potential to affect his duty time for the following day.

The crew had previously operated the Melbourne to Hobart sector arriving at Hobart at 2230 EDT. The Captain reported making three 3-second transmissions on arrival to activate the runway lighting. On becoming visual with the runway, the crew noted that the runway lights were on and believed that they had activated the runway lighting via the PAL system.

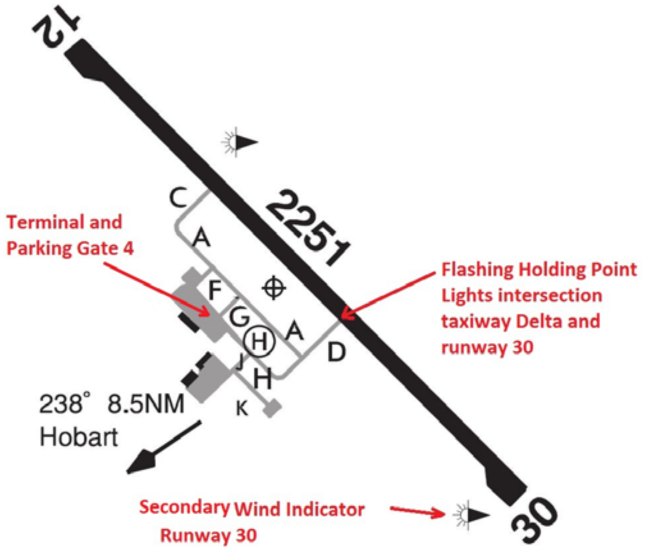
During the turnaround and prior to taxiing for departure, the Captain recalled hearing the “Runway lights 10 minutes remaining warning” and used the same sequence of transmissions that he had used on arrival to reactivate the runway lighting for the departure.

On departure, the crew taxied via taxiways Golf (G), Alpha (A) and Delta (D) for runway 30 (Figure 1). At the intersection of taxiway Delta (D) and runway 30 there were alternating flashing holding point lights. The Captain reported that the flashing holding point lights confirmed in his mind that the runway lights were on.

The Captain did not recall seeing the windsock adjacent to the runway threshold as they approached the turning node at the end of the runway. However, the First Officer particularly recalled looking to the windsock and confirming the wind direction and that the windsock lights were not flashing. He later concluded that the windsock must have been lit by the aircraft lights as the aircraft turned through the turning node.

Both flight crew commented that they had no difficulties maintaining directional control during the taxi and take-off roll, further noting that at no time did anything seem unusual or out of the ordinary.

Figure 1: Airport Diagram



Source: Airservices Australia

ATSB comment

Two pilot activated lighting systems exist at Australian airports, Pilot Activated Lighting (PAL) and Aerodrome Frequency Response Unit plus PAL (AFRU+PAL). Hobart Airport is equipped with the ARFU+PAL type installation.

The two systems differ in their activation methods. The PAL system requires three 3-second pulses with 1 second between each pulse. The PAL + AFRU system requires three 1-second pulses with 1 second between each pulse and the sequence must be completed within 5 seconds to be effective.

On arrival to Hobart, the Captain reverted to the older, PAL-only activation sequence. On becoming visual on approach to Hobart the crew observed that the runway lights were on and were of the belief that they had activated the lighting via the PAL. However, Hobart Tower had deactivated at about the same time as the crew of JQG became visual and the Tower had switched the runway lighting over to the PAL system, activating the runway lighting. On departure, the crew employed the same incorrect activation sequence when attempting to activate the runway lighting.

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.

Jetstar Airways

As a result of this occurrence, Jetstar Airways advised the ATSB that they have taken the following safety action;

- An internal memo was issued to flight crew reminding them that there were two different systems for activation of PAL in Australia.
- A review of the Quick Reference Handbook to include normal operations that are not regularly applied, including activation of PAL lighting.
- Review of training programs relevant to operations at non-towered aerodromes.

- Company documents to be reviewed to ensure policy is clear in regard to operations from a non-towered aerodrome and provision of an alternate aerodrome.
- Jetstar has raised concerns regarding the reliance on PAL lighting in RPT operations with Airservices Australia and the Civil Aviation Safety Authority.
- A procedure is to be developed to task ground staff in attendance with ensuring lighting has been activated for arrival and departure of company services.

Hobart International Airport

As a result of this occurrence, Hobart International Airport has taken the following safety action;

- Commenced changing the airport lighting program so that the lighting stays on until after the last regular public transport (RPT) aircraft movement.
- Where there is an out of schedule movement, the airport authority will manually activate the lighting, until such time that all RPT movements have been completed.
- All Hobart Airport Senior Operations Officers were briefed and instructed in regard to their expected actions and duty of care in this type of event.

Safety message

Runway and taxiway lighting serves many important functions for a departing aircraft. For example it provides:

- navigational guidance around the airport
- directional guidance during the take-off roll
- an indication of the location of the end of the runway
- necessary guidance for approach and landing if required due to an emergency shortly after takeoff

This incident highlights the potential hazards associated with change blindness, inattention blindness and expectation bias.

Change blindness occurs when a person does not notice that something is different about the visual environment relative to before the change. Research has shown that in some cases, quite dramatic changes are not detected, particularly if changes occur when the observer is not looking at the relevant part of the visual environment.

Inattention blindness occurs when a person does not notice an object which is visible, but unexpected, because their attention is engaged on another task. In this instance, the absence of airport lighting was noticeable, if looked for. However, the crew had an assumption or expectation that the lighting was on.

In simple terms, expectation bias is 'seeing' what you expect to see even when it is not there, in this case, runway lighting being on.

Defining a specific place for PAL tasks in the crew's sequence of procedures, such as when the pre-taxi CTAF call is made and incorporating this into a pre-taxi checklist, could potentially ensure more reliability in performing these tasks.

For similar events involving take-offs without runway lighting refer to:

- ATSB Investigation; AO-2008-020, Procedures-related event, Launceston Airport, Tas., 12 March 2008, VH-VQY, Airbus A320-200

  www.atsb.gov.au/publications/investigation_reports/2008/aair/ao-2008-020.aspx
- ATSB Investigation; AO-2012-069, Take-offs without runway lighting, Gladstone Airport – 16 and 17 May 2012

  www.atsb.gov.au/publications/investigation_reports/2012/aair/ao-2012-069.aspx

For further information on change and inattention blindness and expectation bias refer to:

- *Deadly Omissions* – Transport Canada
  www.tc.gc.ca/eng/civilaviation/publications/tp185-2-10-feature-3718.htm
- Sights unseen – American Psychological Association
  www.apa.org/monitor/apr01/blindness.aspx

General details

Manufacturer and model:	Airbus A320	
Registration:	VH-JQG	
Operator:	Jetstar	
Type of operation:	Regular Public Transport	
Occurrence category:	Incident	
Primary occurrence type:	Runway Lighting Event	
Location:	Hobart Airport	
	Latitude: 42° 50.15’ S	Longitude: 147° 30.20’ E
Damage:	Nil	

Turboprop aircraft

Runway incursion between a Fairchild SA227, VH-WBA and a vehicle

What happened

On 14 January 2013, a Skippers Fairchild SA227 aircraft, registered VH-WBA (WBA), was being operated on a scheduled passenger flight to Leinster aerodrome, Western Australia, with two crew and six passengers onboard.

At about 1045 Western Standard Time,[1] the aerodrome reporting officer (ARO), who was a qualified electrician, arrived at Leinster aerodrome to continue a works order that required the levelling of the runway lights. The ARO went to the terminal office to retrieve a hand held radio and then drove onto the taxiway. Before entering the runway, he made a broadcast on the Leinster common traffic advisory frequency (CTAF) using the hand held radio, indicating he was entering runway 10/28. The ARO reported that he received the voice identification of 'Leinster aerodrome' from the aerodrome frequency response unit (AFRU).[2] He proceeded to the end of runway 28 and commenced work. As the temperature was above 40°C, the ARO positioned the vehicle on the edge of the runway to provide some shade from the sun while he worked on the runway light (Figure 1).

Figure 1: Vehicle location on runway

Source: Aerodrome operator

At about 1100, when at top-of-descent, the crew of WBA obtained the weather from the Leinster aerodrome weather information service and briefed to join a 5 NM final for runway 10. The crew contacted their passenger services agent at the aerodrome on a company radio frequency and

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

2 AFRU: A facility installed at certain non-towered aerodromes that provides an automatic response to pilots when transmitting on the CTAF. The AFRU indicates to the pilot that the correct radio frequency has been selected and confirms the operation of the aircraft's transmitter, receiver and volume setting. The pilot will receive either a voice identification, for example 'Leinster aerodrome CTAF', or a 300 millisecond tone or 'beep'.

the agent indicated that the runway was clear.[3] When at 30 NM, the crew broadcast an inbound call on the CTAF[4] advising of their intentions.

At the same time, the ARO only heard the AFRU voice identification of ‘Leinster aerodrome’. He stopped work and looked and listened for an aircraft. As he could not see or hear an aircraft operating in the area, he assumed that it was an aircraft at a nearby aerodrome that used the same CTAF frequency and continued working.

The crew of WBA positioned the aircraft on a 5 NM final and reported making the required broadcasts on the CTAF.

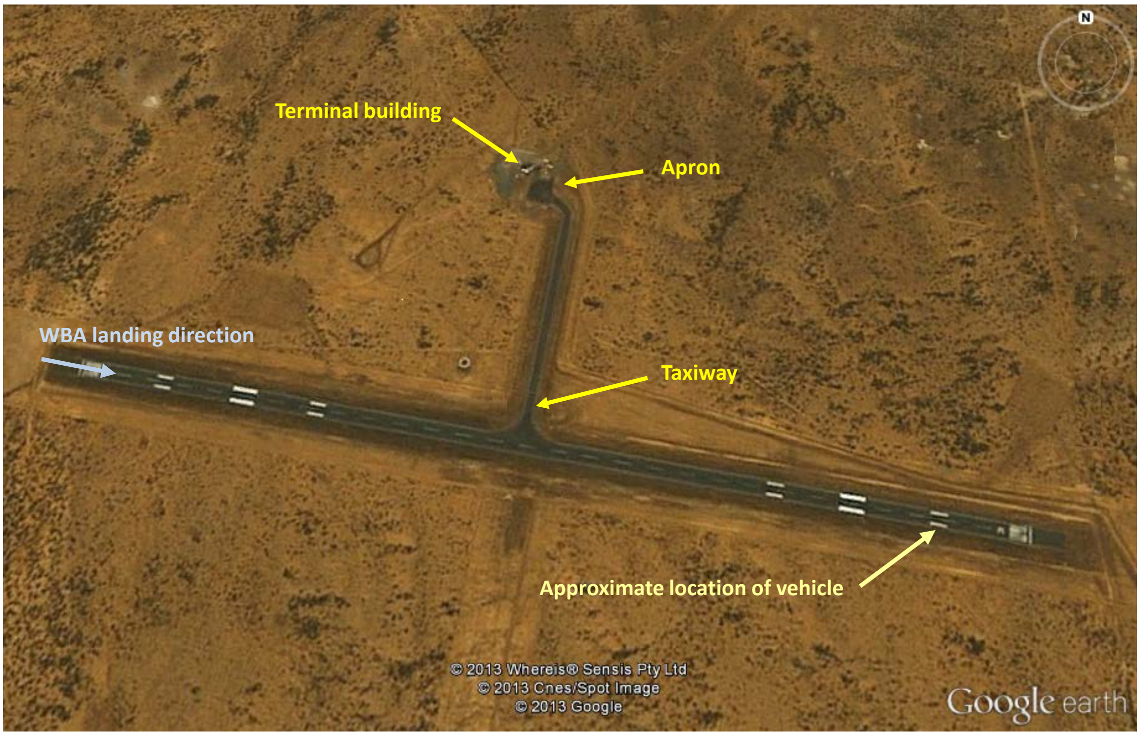
During the landing, at about 1113, the first officer observed something on the runway near the end of runway 28, and commented to the captain that it might be a vehicle. At the same time, the ARO looked up and observed the landing lights of an aircraft coming in to land on runway 10. The crew reported that the heat haze coming off the runway made it difficult to identify that the object was a vehicle. The crew expedited the aircraft’s deceleration and when they got closer, they could see that it was a vehicle positioned on the right side of the runway. The ARO reported that the aircraft appeared to stop before the taxiway that was located about halfway along the runway and he thought that the aircraft would take the taxiway to the terminal. The crew made a broadcast on the CTAF in an attempt to contact the vehicle driver, but no response was received. The ARO reported that this was the first radio transmission that he heard from the aircraft, but it was unintelligible. The ARO moved his tools and the vehicle clear of the runway.

The crew of WBA taxied past the vehicle and used the turning node at the end of the runway to turn around. The aircraft was then taxied back along the runway to the taxiway that led to the terminal (Figure 2). The crew made a broadcast on the CTAF again to contact the vehicle driver, but did not receive a response. The ARO reported that he heard the radio transmission, but it was unintelligible. The crew continued to the terminal and after shutting down, they made another broadcast on the CTAF, with no response received.

[3] The agent, who provided passenger services, was normally informed by the aerodrome reporting officer (ARO) if work was being carried out on the runway.

[4] The crew reported that they had confirmed that they had selected the correct frequency that was contained in the ERSA and on the Leinster aerodrome data card.

Figure 2: Location of vehicle on the runway



Source: Google earth

The ARO reported that he heard the broadcast on the CTAF after WBA was shut down, but again it was unintelligible. The ARO completed the works and made a broadcast advising he was exiting the runway.

The crew of WBA reported that they had made all the appropriate broadcasts on the correct frequency, however, no response to the calls were received. The passenger services agent had reportedly heard the crew's broadcasts on a radio located in the terminal office, but was not aware that runway works were in progress at the time.

Aerodrome reporting officer (ARO) comments

The ARO provided the following comments regarding the incident:

- all radio transmissions received on the handheld radio were unintelligible, apart from the AFRU voice identification of 'Leinster aerodrome'.
- due to the wind direction, which was north-easterly, he was unable to hear the aircraft until it taxied past.
- when conducting maintenance on the runway lights, he would normally park the vehicle off the runway, but as the temperature was above 40 °C, he had used the vehicle to shelter from the sun.
- in general, when he hears the AFRU respond, but there is no accompanying radio broadcast, it is normally an aircraft operating at nearby aerodromes, which use the same frequency as the Leinster aerodrome CTAF.

Pilot comments

The crew reported that the heat haze coming off the runway affected their visibility and it wasn't until they had touched down that they could see something was there, although they could not identify it was a vehicle until they were closer. The crew also reported that there was no Notice to Airmen (NOTAM)[5] issued for the works on the runway.

Aerodrome operator investigation

The aerodrome operator conducted an internal investigation into the incident and determined the following:

- the works order had been scheduled at the same time aircraft were planned to arrive and depart.
- no defects with the hand-held radio or AFRU system were found. However, the operator stated that the the operation of the hand-held radio may have been affected by the heat.
- the vehicle was located near the first touchdown marker on runway 28, which was about 160 m from the runway end.There were five surrounding aerodromes that used the same CTAF frequency as Leinster.
- the aerodrome operator determined that a NOTAM was not required as the requirements of Manual Of Standards (MOS) 139 10.10.3 *Time-Limited Works* were met:

  > *10.10.3.3: A person must not commence time-limited works that require more than 10 minutes to restore normal safety standards to the movement area and remove obstacles, unless a NOTAM has been issued not less than 24 hours before the commencement, giving the date and time of commencement and the time required to restore normal safety standards.*

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.

Skippers Aviation

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

- **Flight crew training**: Continual education of all crews to maintain a vigilant lookout, especially when operating at non-towered aerodromes.[6]

Aerodrome operator

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

Aerodrome reporting officer (ARO) training

All AROs are to be provided with practical training on communicating with aircraft personnel.

Leinster aerodrome procedures

- a sign is to be used to advise terminal and ground/apron staff that an ARO is airside[7]
- utilise a pre-recorded message on the AFRU to advise pilots that an ARO is airside
- scheduled aerodrome works to take into account known flight schedules

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

6 A non-towered aerodrome is an aerodrome at which air traffic control (ATC) is not operating, this includes: an aerodrome that is always in Class G airspace; an aerodrome with a control tower, but no ATC service is currently provided, or an aerodrome that would normally have ATC services, but is presently unavailable.

7 Airside is all parts of the aerodrome containing aircraft.

- all aerodrome work notifications are to include a note for ARO's to check with ground crew for any known aircraft movements for the day
- known flight schedules are to be displayed in the airport terminal building and the ARO office
- all aerodrome works are to be approved by the aerodrome manager.

Leinster aerodrome equipment

- installation of a very high frequency (VHF) radio with an external speaker into two ARO vehicles
- aerodrome CTAF/AFRU radios to be regularly inspected, ensuring that they are functioning correctly.

Safety message

The risk of runway incursions and other separation events can be minimised through good communication. This incident shows the importance of communication and ensuring that the systems exist to minimise the likelihood of communication break downs. Effective communication between each of the parts of the aviation system, along with robust systems in place to support the individuals, is essential for safe operations. It also demonstrates the difficulties with having multiple aerodromes operating on the same frequency, highlighting the need for all radio users to remain vigilant and treat all AFRU transmissions with attention. Furthermore, it highlights the benefits of utilising the full functionality of the AFRU system to enhance pilot awareness of operations at an aerodrome.

Broadcasting on and monitoring the CTAF, and maintaining a good lookout is the key way for users to establish situation and traffic awareness when operating at non-towered aerodromes. The following publication: provides additional information on operating at non-towered aerodromes:

- A pilot's guide to staying safe in the vicinity of non-towered aerodrome
  www.atsb.gov.au/publications/2008/ar-2008-044(2).aspx
- Operations at non-towered aerodromes
  www.casa.gov.au/wcmswr/_assets/main/pilots/download/nta_booklet.pdf
- Civil Aviation Advisory Publication (CAAP) 166-1(1) Operations in the vicinity of non-towered (non-controlled) aerodromes
  www.casa.gov.au/wcmswr/_assets/main/download/caaps/ops/166-1.pdf

General details

Occurrence details

Occurrence category:	Incident	
Primary occurrence type:	Runway incursion	
Location:	Leinster aerodrome, Western Australia	
	Latitude: 27° 50.60' S	Longitude: 120° 42.20' E

VH-WBA

Manufacturer and model:	Fairchild Industries Inc. SA227-DC	
Registration:	VH-WBA	
Operator:	Skippers Aviation	
Type of operation:	Air transport - low capacity	
Persons on board:	Crew – 2	Passengers – 6
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Vehicle

Manufacturer and model:	Vehicle	
Registration:	LV580	
Persons on board:	Driver – 1	Passengers – 0
Injuries:	Driver – Nil	Passengers – Nil
Damage:	Nil	

Loss of ground control involving a PZL-Mielec M18A Dromader, VH-TGY

What happened

Damage to VH-TGY

Source: Aircraft operator

On 22 February 2013, at about 0600 Eastern Daylight-saving Time,[1] a PZL-Mielec M18A (Dromader) aircraft, registered VH-TGY (TGY), departed a private airstrip near Bourke for Rumleigh (7 km east-south-east of Brewarrina aerodrome), New South Wales. About 10 minutes later, a second Dromader, registered VH-TZJ (TZJ), also departed Bourke for Rumleigh.

Both aircraft were to conduct aerial application (spraying) operations on cotton fields at Rumleigh. The operation was supported by two ground personnel (mixers) who were responsible for mixing the spray chemicals and loading the aircraft's hoppers.

At about 0630, TGY landed at the Rumleigh airstrip and the mixers[2] loaded the aircraft's hopper with 2,750 L of water/chemical. TGY departed and commenced spraying operations to the south-west of the airstrip.

Shortly after, TZJ landed at Rumleigh and was loaded with 2,700 L of water/chemical. As the take-off run on the south-eastern runway was commenced, TZJ's fire-bombing door[3] unexpectedly released and the water/chemical load was jettisoned onto the ground, contaminating the runway (Figure 1).

The takeoff was continued and the aircraft returned to the airstrip, landing on the north-west runway. During the landing roll, the pilot manoeuvred TZJ to the left of the contaminated area, with the aircraft's left wheel on dry ground and the right wheel on the contaminated area. The pilot shut down the aircraft and confirmed that the cockpit switches were appropriately selected for spraying operations. After exiting, the pilot examined the fire-bombing door, with no irregularities found. As a precaution, the mixers partially loaded the hopper with water to test the door. As the door remained closed, the hopper was re-loaded with the water/chemical.

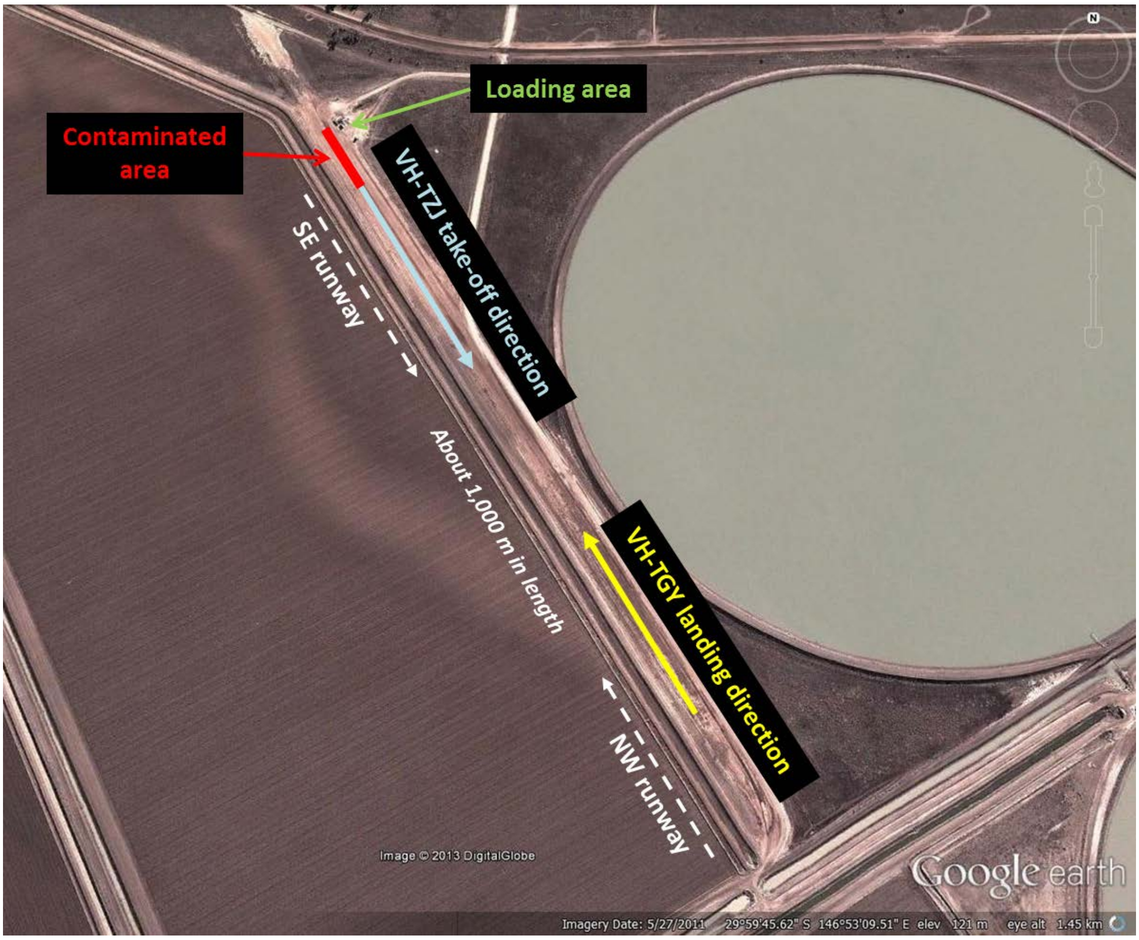
During that time, the pilot of TZJ attempted to contact TGY by Ultra-High Frequency (UHF) radio, but was unsuccessful. The mixers elected not to contact the pilot of TGY as they were of the understanding that he had been advised of the runway contamination by the pilot of TZJ.

TZJ then departed off the south-east runway, through the contaminated area. The pilot reported that, while mud was observed spraying up from the aircraft's wheels, directional control was maintained. After takeoff, the pilot attempted to contact TGY again on the UHF, but without success. The pilot of TZJ commenced his spraying flight.

The pilot of TGY reported observing TZJ depart and land again, but was not concerned as he had not received any communications indicating a problem existed.

1 Eastern Daylight-saving Time (EDT) was Coordinated Universal Time (UTC) + 11 hours.
2 The mixers were positioned at the northern end of airstrip, on the right side of the runway.
3 Fire-bombing doors were attached to the aircraft's hopper. This allowed the aircraft's load to be released quickly when conducting fire suppression operations.

Figure 1: Rumleigh airstrip



Source: Google earth

Soon after, the pilot of TGY completed his spraying flight and joined final approach for the north-west runway. The pilot of TZJ observed TGY tracking towards the airstrip and attempted to contact the pilot on the UHF again.

About 15 minutes after the runway became contaminated, TGY touched down about a quarter of the way along on the north-west runway. At the time, there was a 5 kt tailwind. The pilot reported applying light braking and reverse thrust.

When approaching the runway end at a reasonably slow speed, but faster than his normal taxi speed, the pilot of TGY suddenly observed mud spraying up from the aircraft's wheels. The aircraft then commenced sliding and turning to the left. When the left wheel contacted dry ground, the aircraft swung further left and tipped forward, resulting in the propeller contacting the ground. The aircraft then tipped backwards and the tail wheel assembly detached. TGY came to rest at 90° to the runway direction. The pilot of TGY exited and spoke to the mixers, who advised that the fire-bombing door in TZJ had malfunctioned and released the 2,700 L load, contaminating the runway. TGY sustained minor damage (Figure 2).

TZJ landed to the left of the north-west runway about 15 minutes later. The reason for the fire-bombing door malfunction could not be determined.

Figure 2: Damage to VH-TGY

Source: Aircraft operator

Contamination

The contamination covered a 100-150 m area at the northern end of the runway. As the runway surface was dirt/clay, the water/chemical had soaked in and created a layer of mud. Consequently, the pilot of TZJ reported that, when he landed to re-load, he had difficulties sighting the contaminated area on the runway surface.

Landing (VH-TGY)

The aircraft operator reviewed the incident and believed that a reasonable amount of braking and reverse thrust was being applied when TGY contacted the contaminated area, subsequently resulting in a loss of ground control. The mixers reported to the ATSB that TGY's landing appeared normal and the aircraft's speed was not fast, as also reported by the pilot of TGY.

Communications

The day prior to the incident, the radio in TZJ was reported as operating intermittently; the pilot of TGY could hear broadcasts made by TZJ, but the pilot of TZJ could not hear broadcasts made by TGY. On the day of the occurrence, the pilot of TZJ attempted to contact the pilot of TGY on a number of occasions, but the broadcasts were not heard. The operator advised that the radio audio selector had failed gradually the previous day. Subsequent to the incident, a 100-hourly maintenance inspection of TZJ was conducted, during which time the radio fault was rectified. The radio in TGY was reported as serviceable.

The pilot of TGY also stated that, when they were unable to contact someone using the UHF radio they would generally send a mobile telephone text message. While a text message had not been sent on this occasion, the pilot suggested that an alternative means could have been employed to warn him of the hazard; such as placing the mixers' truck on the runway.

Safety message

A reliable communications system can assist with improving the overall efficiency and safety of an operation. This incident highlights the impact ineffective two-way communications can have on aircraft operations, and in that case, the need to consider alternative means for warning pilots of potential ground hazards.

General details

Manufacturer and model:	PZL-Mielec M-18A (Dromader)	
Registration:	VH-TGY	
Type of operation:	Aerial work	
Occurrence category:	Serious incident	
Primary occurrence type:	Ground strike	
Location:	7 km ESE of Brewarrina aerodrome (Rumleigh), New South Wales	
	Latitude: 30° 00.47' S	Longitude: 146° 52.68' E
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Minor	

Piston aircraft

Collision on ground involving Cessna 150F, VH-ICE

What happened

VH-ICE accident site

Source: Insurance representative

On 9 February 2013, at about 0730 Eastern Daylight-savings Time,[1] a Cessna 150F, registered VH-ICE (ICE), landed on the 11th fairway[2] of the Mt Broughton Golf Club, New South Wales after the initial leg of a return flight from Robertson. The pilot was the only person on-board and had been authorised and pre-arranged with the Golf Club to use the fairway as a landing area.

After landing to the south, the pilot backtracked along the landing area[3] to conduct a short field take-off in the same direction (Figure 1).

The pilot reported that the aircraft accelerated as normal, however during the take-off run he realised the aircraft would not clear the trees at the end of the landing area and elected to reject the take-off. The pilot reduced the power to idle and applied the brakes, however the remaining distance was insufficient and the left wing impacted a tree, the aircraft turned over and came to rest inverted. The pilot was uninjured and the aircraft sustained substantial damage (Figure 2).

Figure 1: Landing area

Source: Google earth

View of the landing area from point of takeoff

Source: Insurance representative

1 Eastern Daylight-saving Time (EDT) was Coordinated Universal Time (UTC) + 11 hours.
2 The 11th hole is advertised to be 440 m long (1,443 ft).

Figure 2: VH-ICE damage to the left wing

Source: Insurance representative

Pilot comments

The pilot reported that the landing area had short grass that was wet from dew. He had previously landed and taken off at the landing area in ICE without incident and had prior permission from the Golf Club to use the landing area[4]. He also stated that he did not know the available take-off distance.

The pilot commented that it was a clear day, with a 2 to 3 knot wind from the south.

The pilot reported that the aircraft had been modified with the installation of a 160 hp engine (Lycoming 0-320 D3G) from the 100 hp engine and the installation of vortex generators on the wings and horizontal stabiliser in accordance with supplemental type certificates.

Accident site

An insurance assessor attended the accident site and reviewed the landing area. The landing area had a hard surface with short grass and 50 ft high trees at the southern end of the fairway. The assessor determined that the effective available take-off length of the landing area was 1,180 ft. Based on performance charts in the approved Cessna 150F owner's manual, the take-off distance required by the unmodified Cessna 150 F was 1,583 ft. There was no available performance data that took into account the installation of the 160 hp engine.

Safety message

This accident highlights the importance of following the published performance data for your aircraft and knowing the performance requirements, physical characteristics and dimensions of the landing area that you are intending to take-off and land on. Other factors, such as

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4 See *Civil Aviation Regulation (CAR) 93*.

environmental conditions, may affect the usable landing area length needed for a safe take off, landing or rejected take-off.

The Civil Aviation Safety Authority publication Civil Aviation Advisory Publication 92-1(1) *Guidelines for aeroplane landing areas* contains guidance for determining the suitability of the intended landing area for approved aircraft to take off and land on safely. It is available at www.casa.gov.au/wcmswr/_assets/main/download/caaps/ops/92_1.pdf

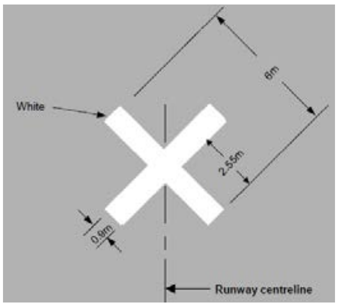
General details

Manufacturer and model:	Cessna 150F	
Registration:	VH-ICE	
Type of operation:	Private	
Occurrence category:	Accident	
Primary occurrence type:	Collision on ground	
Location:	21 km SW of Mittagong (ALA), NSW	
	Latitude: 34° 34.07' S	Longitude: 150° 19.30' E
Persons on board:	Crew – 1	Passengers – 0
Injuries:	Crew –Nil	Passengers – Nil
Damage:	Substantial damage	

Landing on a closed runway involving a Cessna 310, VH-TWN

What happened

Unserviceability marking



Source: CASA

On 20 February 2013, at about 0615 Eastern Daylight-saving Time[1], the pilot of a Cessna 310 aircraft, registered VH-TWN (TWN), arrived at Wagga Wagga Airport to conduct a freight charter flight to Albury and Corowa, New South Wales.

In preparation for the flight, the pilot reviewed the applicable weather forecasts and Notice to Airmen (NOTAM)[2] on a computer. At that time, another company employee initiated a conversation with the pilot. The pilot completed his pre-flight preparations and the aircraft departed at 0730 for Albury.

Prior to 0800, four workers at the Corowa aerodrome commenced laying unserviceability cross markers on runway 05/23. The runway had been declared closed from 0800 to 1800 due to works in progress (WIP); runway 14/32 remained open.

Soon after, the Corowa Aerodrome Manager and works contractor drove along the runway to discuss the WIP. The Aerodrome Manager was also aware that the regular charter flight was due to arrive and was maintaining a lookout for the aircraft, which he expected to land on runway 14/32.

At about 0810, TWN departed Albury for Corowa. When 19 NM and 10 NM from Corowa, the pilot reported broadcasting an inbound call on the common traffic advisory frequency (CTAF) [3].Due to the calm wind conditions, the pilot elected to join the base leg of the circuit for runway 23. The pilot broadcast additional calls on the CTAF advising he had joined base, and soon after, turned onto final.

The workers at Corowa were in the process of placing the last unserviceability cross marker near the runway 05 threshold, when they observed an aircraft (TWN) on final approach for runway 23 (Figure 1). The workers vehicle, with its headlights and flashing safety light on, was also positioned on the runway facing the direction of TWN. The workers and vehicle vacated the runway.

At the same time, the Aerodrome Manager and contractor drove to the parking area located next to the aerodrome terminal and exited the vehicle. The Aerodrome Manager then reported hearing an aircraft. He looked across and observed TWN below the tree line, about 5 m above the ground.

At about 0825, TWN landed on runway 23. Immediately after landing, when about 90-120 m along the runway, the pilot observed an unserviceability cross marker on the ground. The aircraft was taxied to the parking area via runway 14/32, during which time the pilot checked the NOTAM for Corowa and noted that runway 05/23 was closed due to WIP.

The workers were monitoring the CTAF on a hand held radio, but no broadcasts from TWN were reportedly heard.

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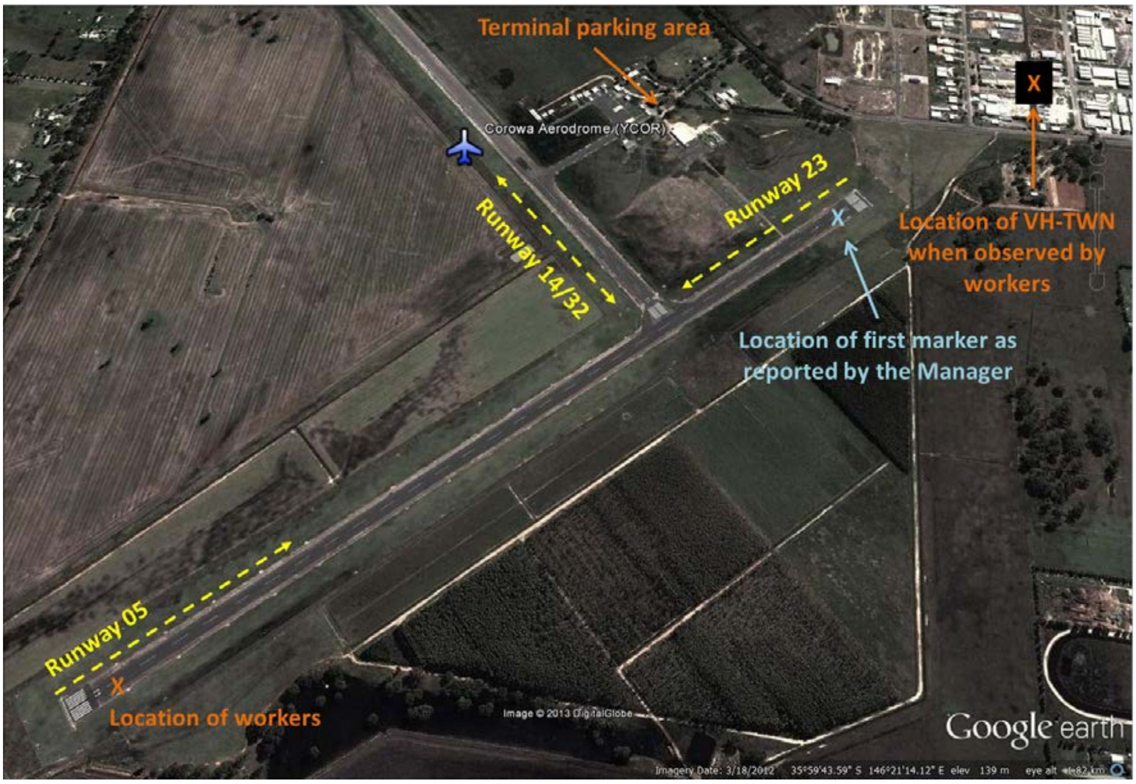
1 Eastern Daylight-saving Time (EDT) was Coordinated Universal Time (UTC) + 11 hours.

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

3 Radio broadcasts made by the pilot on the CTAF could not be verified as transmissions at Corowa were not recorded.

Figure 1: Position of VH-TWN and aerodrome workers



Source: Google earth

Runway works in progress (WIP)

Major repair work was to be conducted on runway 05/23 as a result of flood damage. Prior to the work being commenced, core samples of the runway were to be taken on 20 February 2013 using a drilling rig, which necessitated the closure of the runway.

Two days prior to the scheduled works, the Aerodrome Manager submitted a request to Airservices Australia for the issue of a NOTAM declaring runway 05/23 closed between 0800 and 1800 due to the WIP. The Aerodrome Manager received a copy of the NOTAM the day prior to the incident.

Runway unserviceability markings

The Civil Aviation Safety Authority (CASA) Manual of Standards (MOS) Part 139 – Aerodrome[4], states that:

> An unserviceability marking or closed marking must be used to indicate any part of a runway, which is not to be used by aircraft. The marking must comprise a white cross placed on the unserviceable portion of the runway.

According to MOS 139, the unserviceability marker used on runway 05/23 was considered a ‘smaller’ marking (Figure 2). These types of markings are to be displayed at each end of the unserviceability and in the intermediate area at intervals of no more than 200 m. The Aerodrome Manager reported that there was 10-11 unserviceability markers placed on the runway, with the first marker placed near the runway 23 number. Consequently, the spacing between each unserviceability marker was per the requirements of MOS 139.

The Aerodrome Manager also reported that each cross arm was 6 m long and 0.75 m wide. The crosses were made from white canvas and were nailed to the runway.

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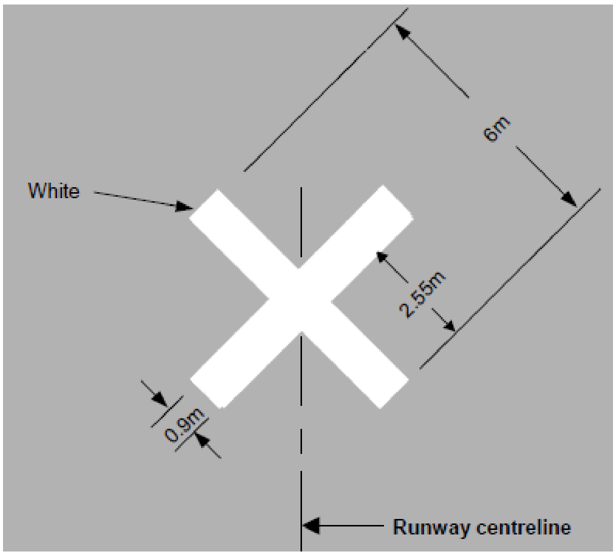
4 www.comlaw.gov.au/Details/F2012C00280/Download

Figure 2: A 'smaller' unserviceability marking



Source: CASA

Pilot comments

The pilot provided the following comments regarding the incident:

- The job had become repetitive in nature as he had conducted the same flight 3-4 times per week, for the last 2 years.
- When reviewing the NOTAMs for the flight, he did not observe the description stating that runway 05/23 was not available due to WIP. The pilot reported that he had become distracted by the other company employee and that the NOTAM looked the same as it had on previous occasions. The additional information regarding the WIP was not obvious.
- The pilot did not observe any workers/vehicle on the runway during the approach and landing.
- When on final approach, he did not see an unserviceability cross marker near the runway 23 threshold. However, when he departed in the afternoon, a marker was observed.
- The unserviceability cross markers did not appear large in size. The pilot would have expected the markers to cover a large portion of the runway width.

The pilot also identified a number of points that all pilots should consider:

- double check NOTAMs, even if they appear the same as previously
- do not engage in conversation during the planning stages of flight
- even when operating to the same location on a regular basis, overfly the aerodrome and conduct a circuit to assess the suitability of the runway.

Aerodrome Manager comments

The Aerodrome Manager reported that the runways at Corowa were inspected only twice per week. Consequently, hazards from surrounding farm land or from other sources may be present. The Manager suggested that pilots operating into country aerodromes should overfly the aerodrome and inspect the runway for hazards prior to landing.

Aircraft operator comments

The operator had previously identified complacency as an issue in their freight operations. Consequently, the operator rarely maintains their pilots in the one geographical location for more than 12 months, and in the majority of cases, pilots are relocated within 6 months. However, this is dependent on the pilot's personal circumstances.

Safety action

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

Aircraft operator

As a result of this occurrence, the aircraft operator has advised the ATSB that they have distributed a flight crew notice to all staff highlighting the dangers of complacency in the work place.

Safety message

This incident demonstrates the importance of maintaining a high level of vigilance, even when conducting familiar tasks; and the unexpected nature of distractions and the impact they can have on pre-flight preparations.

Familiarity of operations

Complacency, the feeling of satisfaction or contentment with what is happening, may occur from a pilot's overconfidence in performing a task that has been previously conducted numerous times, without incident. This feeling is generally due to a lack of understanding of the hazards that may occur during a flight. This may result in a pilot inadvertently overlooking important information or responding to a situation inappropriately. The best defence against complacency is for pilots to remain vigilant and alert, and be mindful that the even the most routine tasks must be conducted with care and concentration.[5]

Distractions

While distractions occur frequently, some cannot be avoided, but others can be minimised or eliminated. Acknowledging this distinction is the first step in developing preventative strategies and lines-of-defence. The Flight Safety Foundation suggests that after a distraction source has been recognised and identified, the next priority is to re-establish situation awareness by conducting the following: [6]

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

General details

Manufacturer and model:	Cessna Aircraft Company 310R	
Registration:	VH-TWN	
Type of operation:	Charter - freight	
Occurrence category:	Serious incident	
Primary occurrence type:	Runway event	
Location:	Corowa aerodrome, New South Wales	
	Latitude: 35° 59.42' S	Longitude: 146° 21.08' E
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

5 www.skybrary.aero/index.php/Discipline_(OGHFA_BN)
6 flightsafety.org/files/alar_bn2-4-distractions.pdf

Runway incursion between a Cessna 206, VH-TOC, and an airport safety vehicle

What happened

On 24 February 2013, the pilot of a Cessna 206 aircraft, registered VH-TOC (TOC), was conducting a private flight from Lake Nash, Northern Territory, to Mount Isa, Queensland and return. The purpose of the flight was to collect two passengers, who were to attend a scheduled meeting at Lake Nash.

Vehicle with safety stickers

Source: Mount Isa Airport Pty. Ltd

When about 20 NM from Mount Isa, the aircraft's avionics system failed. The pilot attempted to restore the system by turning the avionics master switch off and on, and checking the radios, circuit breakers and electrical master switch, but it did not respond. The pilot commenced the radio failure procedure by squawking the transponder code of 7600[1] and transmitting blind.[2] Due to the remoteness of the area, his mobile telephone was unable to receive a signal.

The pilot considered returning to Lake Nash; however, as he was aware of the importance of the passengers' attendance at the meeting, he elected to continue. Additionally, he had hoped to rectify the avionics malfunction once on the ground.

The pilot overflew the airport to assess the wind conditions and rocked the aircraft's wings to alert any ground personnel of the communication failure.[3] The aircraft then joined the circuit on a mid-field crosswind for runway 34.

At about 1200 Eastern Standard Time,[4] the Mount Isa airport safety officer (ASO) was preparing to conduct a runway and lighting inspection in vehicle 'Safety One' in preparation for the arrival of a scheduled passenger flight at 1340. The ASO turned on the vehicle's radio and the primary and secondary lighting, which included a rotating flashing light mounted on the roof. The ASO then activated the pilot activated lighting (PAL)[5] and aerodrome frequency response unit (AFRU)[6] systems, and received a response from the AFRU indicating the correct radio frequency had been selected.

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1 The transponder code of 7600 is the international code used to alert air traffic control that the aircraft's communication system has failed.

2 Transmitting blind: A transmission from one station to another in circumstances where two-way communication cannot be established, but it is believed that the called station is able to receive the transmission.

3 En Route Supplement Australia (ERSA) – Emergency Procedures 1.5 'Communication Failure'.

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

5 PAL: Pilot activated runway and taxiway lighting is activated by a series of timed transmissions using the very high frequency radio, on either a discrete or the local airport communication frequency.

6 AFRU: A facility installed at certain non-towered aerodromes that provides an automatic response to pilots when transmitting on the common traffic advisory frequency (CTAF). A response from the AFRU indicates to the pilot that the correct radio frequency has been selected and confirms the operation of the aircraft's transmitted and receiver, and volume setting. The pilot will receive either a voice identification, for example 'Mount Isa CTAF', or a 300 millisecond tone or 'beep'. A series of three microphone clicks within a period of 5 seconds will also cause the AFRU to transmit a voice identification for the particular aerodrome. PAL operation may be provided as an optional function of the AFRU.

When at the taxiway ‘Bravo’ holding point (Figure 1), the ASO broadcast a call on the Mount Isa common traffic advisory frequency (CTAF) advising that the vehicle was entering the runway; no response was received. The ASO conducted a lookout for aircraft operating within the vicinity, and with none sighted, the inspection was commenced. The vehicle was driven to the runway 34 threshold and then towards the runway 16 threshold at a speed of about 40 km/hr.

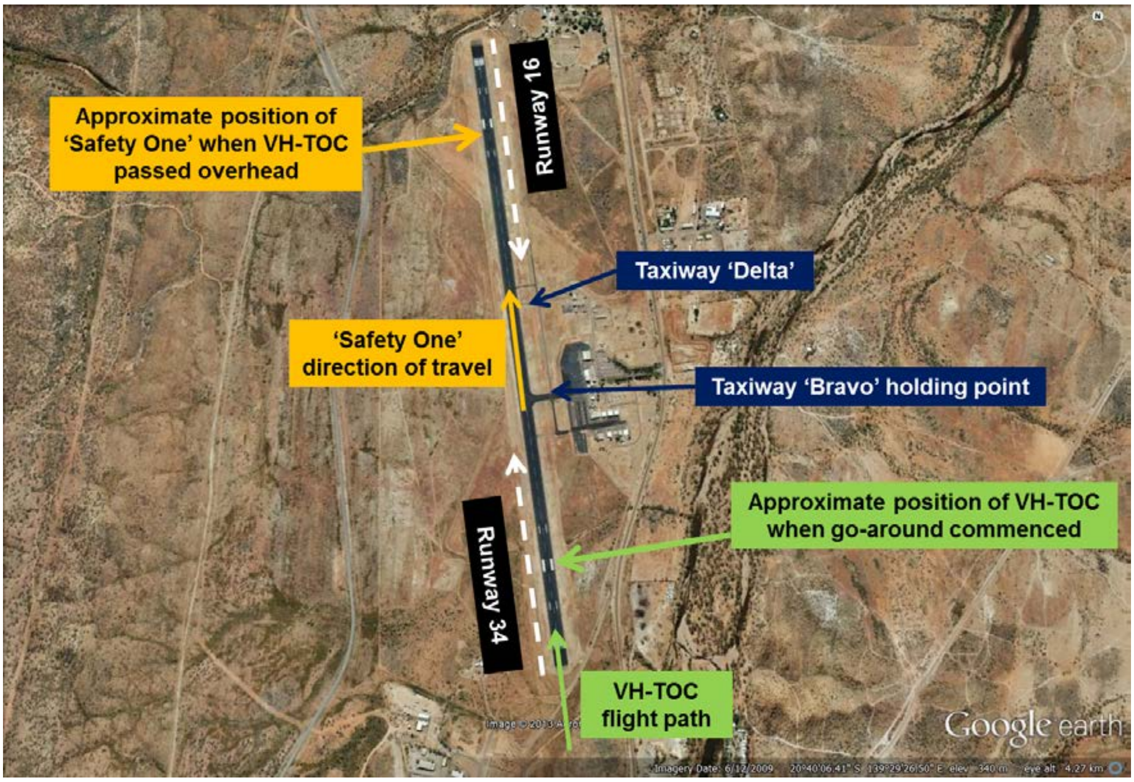
At the same time, when on the base leg of the circuit for runway 34, the pilot of TOC observed a vehicle near the runway 34 threshold. He assumed the ASO was conducting a bird inspection and would exit the runway at taxiway ‘Bravo’, leaving the runway clear for him to land. The pilot continued to transmit his intentions blind.

When on final approach, the pilot configured the aircraft for landing, aiming to touchdown about 300 m beyond the threshold. As he commenced the flare,[7] he noticed that the vehicle had not yet vacated the runway and was travelling in a northerly direction towards the runway 16 threshold. At this time, the vehicle was between taxiways ‘Bravo’ and ‘Delta’. As a result of the vehicle being on the runway, the pilot initiated a go-around.[8]

When about 100-200 m away from the vehicle, the pilot levelled the aircraft to gain the ASO’s attention. As the aircraft passed 200-300 ft above the vehicle, the pilot rocked the wings to convey his intention to land. The ASO heard TOC pass overhead and immediately vacated the runway. The ASO attempted to contact TOC on the CTAF, but no response was received. The ASO had not been aware that TOC was operating in the circuit.

The pilot of TOC conducted a second circuit and landed without further incident.

Figure 1: Approximate positions of VH-TOC and ‘Safety One’



Source: Google earth

7 Flare: Final nose-up pitch of landing aeroplane to reduce rate of descent close to zero at touch-down.

8 Go-around: A discontinuation of the landing, and a transition through a reconfiguration of the aircraft into an initial climb profile.

Pilot comments

The pilot provided the following comments regarding the incident:

- With hindsight, he should have commenced the go-around earlier.
- His decision to continue the flight may have been influenced by the passengers required attendance at the meeting. Also, he did not want to be operating in the circuit with an unserviceable radio at the same time as other aircraft.

Safety action

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

Mount Isa Airport Pty. Ltd.

Mount Isa Airport Pty. Ltd. had planned to place yellow and black checkered safety stickers on the side and rear of the vehicle. As a result of this occurrence, that action was immediately implemented.

Safety message

A go-around is a standard manoeuvre performed when a pilot is not completely satisfied that the requirements in place for a safe landing have been met.

The need to conduct a go-around may occur at any point in the approach and landing phase, but according to the United States Federal Aviation Administration, the most critical go-around is one initiated when very close to the ground. Consequently, the sooner a condition that warrants a go-around is recognised, the safer the manoeuvre will be.

General details

Primary occurrence type:	Runway incursion	
Occurrence category:	Incident	
Location:	Mount Isa Airport, Queensland	
	Latitude: 20° 39.83' S	Longitude: 139° 29.32' E

Cessna C206, VH-TOC

Manufacturer and model:	Cessna Aircraft Company U206G	
Registration:	VH-TOC	
Type of operation:	Private	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

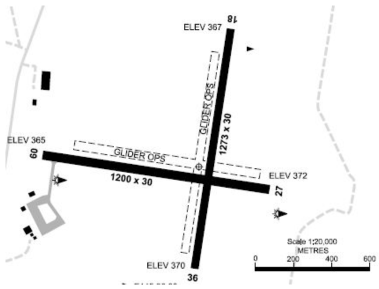
Airport safety vehicle details

Manufacturer and model:	Toyota Hilux Dual Cab	
Registration:	Safety One	
Type of operation:	Airport safety vehicle – runway and lighting inspection	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Collision on runway between Grob G103 Twin Astir glider, VH-UIZ and Cessna 150F, VH-ROZ

What happened

Tocumwal Aerodrome



Source: Airservices Australia

On 9 March 2013, two glider clubs were conducting gliding operations at the same time as an aerobatic aircraft event was being conducted at Tocumwal aerodrome, New South Wales. The gliders and glider tug aircraft were operating left circuits from the grass runway 36 left (36L) and the aircraft involved in the aerobatic event were operating right circuits from runway 36 right (36R), the sealed runway. Once airborne, the gliders were being towed to the west of the aerodrome prior to release, to remain clear of the aerobatic aircraft. The aerobatic activity was being conducted in a 'box' directly overhead the aerodrome down to 1,200 ft above mean sea level.

A 'Tocumwal Advisory' radio service was being provided to the aerobatic aircraft by a ground station transmitting on the Tocumwal Common Traffic Advisory Frequency (CTAF). The constant radio traffic generated on the CTAF by the Tocumwal Advisory service, the aerobatic aircraft, gliders and glider tug aircraft meant that the radio frequency was more congested than normal at Tocumwal.

At 1313 Eastern Daylight-saving Time[1], a Grob G103 Twin Astir glider, registered VH-UIZ (UIZ), was towed airborne for a solo flight to the west of the aerodrome and released at 2,000 ft. The pilot of UIZ heard the CTAF broadcasts made by the glider tug pilot, as the tug rejoined the circuit and landed. After a number of orbits looking for rising air, the pilot of UIZ tracked to return to the circuit and land.

At 1316, a Cessna 150F (C150), registered VH-ROZ (ROZ), became airborne towing a glider and tracked to the west prior to releasing the glider at 1,700 ft for a cross-country flight. ROZ and this glider were from one gliding club, UIZ from the other. Following the release, the pilot of ROZ turned left and tracked for a left downwind for runway 36L, making all necessary CTAF broadcasts.

The pilot of UIZ heard the downwind CTAF broadcast made by the pilot of ROZ, but did not recall hearing any other broadcasts from that aircraft.

The pilot of ROZ made the required CTAF broadcast, just prior to turning the aircraft onto the base leg of the circuit, at about 1,000 ft, and while doing about 65 to 70 knots. As he completed the turn, he reported hearing a poor quality broadcast from an aircraft on downwind. As all the broadcasts he had heard from Tocumwal Advisory and the aerobatic aircraft had been loud and clear, he determined that the call he had just heard was from a glider on left downwind, which was well behind him.

The pilot of UIZ had joined downwind for runway 36L, abeam the upwind threshold at about 1,300 ft, doing between 55 and 60 knots, when he made the required CTAF broadcast. As he was 100 ft lower than the standard height on downwind, the pilot of UIZ was very conscious of the need to expedite the landing.

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

The subsequent sequence of events could not be determined, as neither aircraft heard the CTAF broadcasts from the other. However, witnesses on the ground reported hearing both pilots making all necessary CTAF broadcasts.

The pilot of ROZ reported seeing no other aircraft or any gliders while in the circuit. The pilot of UIZ reported seeing only one aircraft while in the circuit, well to the south of the aerodrome when UIZ was on left base. The pilot of UIZ was not able to determine the direction of travel of that aircraft due to the need to focus on landing the glider.

At 1326, just as ROZ touched down on runway 36L, the pilot felt a heavy jolt on the top of the cockpit and simultaneously heard a loud noise. Immediately, he saw the windscreen fill with the underside of a glider. He observed the glider continue down the runway at about 5 to 10 ft above ground level. As soon as the aircraft came to a stop, the pilot of ROZ turned off the runway and did not see the glider land. The pilot was uninjured and, on exiting the aircraft, observed a wheel contact print on the top of the aircraft.

The pilot of UIZ was uninjured and landed the glider well down the runway. Although UIZ was fitted with a FLARM[2] collision warning system, no alarm was triggered, as the tug aircraft was not fitted with a similar FLARM system. On exiting the glider, the pilot observed damage on the left wing and fuselage. However, he was not aware that he had landed on the tug aircraft until club personnel arrived in an airfield vehicle.

Both gliding clubs operated with a radio-equipped observer on the ground, known as the ‘duty pilot’, to record glider departure and arrival times and to observe operations. Though both duty pilots observed the latter stages of the accident sequence, they were engaged in other activities remote from the radios.

Gliding Federation of Australia

Both gliding clubs operated under the rules and procedures proscribed by the Gliding Federation of Australia (GFA). The investigation conducted by the GFA determined that glider and tug landed together with the glider on top. Propeller strikes caused damage to the underside of the glider’s left wing and along the fuselage near the main landing wheel (Figure 1). There was no damage to the C150.

The GFA investigation determined that the glider tug and glider would have been operating at similar speeds, on simultaneous final approach aiming to land on the same runway, using a similar aiming point. The restricted visibility from both cockpits would have resulted in neither pilot being aware of the other.

The GFA investigation also noted:

> *While the pilot of both aircraft made appropriate broadcasts on the CTAF, it is possible the radio transmissions tug to glider were not heard due to proximity interference. Frequency congestion from the aerobatic operations may also have impeded situational awareness.*

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2 The FLARM, from ‘flight alarm’, collision warning system activates when another FLARM system is detected within a predetermined proximity. The FLARM system fitted to UIZ would have provided an audible alarm only, with no directional or distance information.

Figure 1: Damage to VH-UIZ

Source: Operator

ATSB comment

The poor quality of UIZ's downwind CTAF broadcast as heard by the pilot of ROZ, and the fact the neither pilot heard any other broadcasts from the other during the unfolding incident, may have been a result of radio receiver dynamic range performance. The sensitivity of a radio receiver can easily be overloaded when strong signals are present, for example when the transmitting radio is very close to the receiving radio.

Safety actions

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 actions in response to this occurrence.

Gliding Federation of Australia

As a result of this occurrence, the GFA has advised the ATSB that they will raise awareness of collision risk at non-towered aerodromes with its members through the Gliding Magazine and through its biennial Safety Seminars.

Glider tug operator

As a result of this occurrence, the operator of the glider tug has advised the ATSB that they are sourcing quotes for the fitment of FLARM to their gliders and glider tug aircraft.

Safety message

When operating outside controlled airspace, it is the pilot's responsibility to maintain separation with other aircraft. For this, it is important that pilots utilise both alerted and unalerted see-and-avoid principles. Pilots should never assume that an absence of traffic broadcasts means an absence of traffic.

Issues associated with unalerted see-and-avoid have been documented in an ATSB research report *Limitation of the See-and-Avoid Principle*. Unalerted see-and-avoid relies entirely on the ability of the pilot to sight other aircraft. A traffic search in the absence of traffic information is less likely to be successful than a search where traffic information has been provided because knowing where to look greatly increases the chance of sighting the traffic.

The Civil Aviation Safety Authority (CASA) has published a number of Civil Aviation Advisory Publications (CAAPs) dealing with operations at non-towered aerodromes and the importance of not relying solely on radio broadcasts for traffic advice.

The following publications provide useful information on radio use and the limitations of see-and-avoid.

- Civil Aviation Advisory Publication 166-1(0) – *Operations in the vicinity of non-towered (noncontrolled) aerodromes* is available at casa.gov.au/wcmswr/_assets/main/download/caaps/ops/166-1.pdf
- Civil Aviation Advisory Publication 166-2(0) – *Pilots' responsibility for collision avoidance in the vicinity of non-towered (non-controlled) aerodromes using 'see-and-avoid'* is available at casa.gov.au/wcmswr/_assets/main/download/caaps/ops/166-2.pdf
- Civil Aviation Advisory Publication 5-59(1) – *Teaching and Assessing Single-Pilot Human Factors and Threat and Error Management* is available at casa.gov.au/wcmswr/_assets/main/download/caaps/ops/5_59_1.pdf
- *Limitations of the see-and-avoid principle* (1991) is available at www.atsb.gov.au/publications/2009/see-and-avoid.aspx
- *A pilot's guide to staying safe in the vicinity of non-towered aerodromes* (AR-2008-004(1)) is available at www.atsb.gov.au/publications/2008/ar-2008-044(1).aspx
- *Pilots' role in collision avoidance* (Federal Aviation Administration Advisory Circular AC 90-48C) is available at rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%2090-48C/$FILE/AC90-48c.pdf
- *Collision avoidance strategies and tactics* is available at www.aopa.org/asf/publications/sa15.pdf
- A Flight Safety Australia article, *Sharing the skies – gliders* printed in Issue 87 July-August 2012, is available at: www.flightsafetyaustralia.aero/#folio=1

More information on radio receiver dynamic range performance is available at www.radio-electronics.com/info/receivers/dynamic_range/dynamic_range.php

General details

Occurrence details

Primary occurrence type:	Collision on ground	
Occurrence category:	Accident	
Location:	Tocumwal Aerodrome, NSW	
	Latitude: 35° 48.65' S	Longitude: 145° 36.25' E

Grob G103 Twin Astir glider

Manufacturer and model:	Grob – Burkaart Flugzeugbau – Twin Astir G103	
Registration:	VH-UIZ	
Type of operation:	Gliding	
Persons on board:	Crew – 1	Passengers – 0
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Substantial	

Cessna 150

Manufacturer and model:	Cessna Aircraft Company 150F	
Registration:	VH-ROZ	
Type of operation:	Sports aviation	
Persons on board:	Crew – 1	Passengers – 0
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Minor	

Wildlife strikes involving a Mooney M20J, VH-CYK

What happened

On 24 March 2013, at about 1615 Eastern Standard Time,[1] a Mooney M20J aircraft, registered VH-CYK, departed the Hedlow aeroplane landing area (ALA), Queensland on a private scenic flight. On board the aircraft were the pilot and two passengers.

On returning to Hedlow, at about 1725, the aircraft joined the circuit and a normal approach was conducted. The pilot commenced the flare[2] at about 10 ft above the runway, during which time one of the passengers commented about two large birds that had just taken flight from an area of long grass to the right of the runway. The pilot then saw a ‘flash’ to the right of the aircraft and he initiated a go-around.

One of the birds flew in front of the aircraft and struck the left wing. The pilot reported that the aircraft yawed slightly left and the left wing dropped; he applied opposite aileron to maintain wings level. He then momentarily looked inside the cockpit to confirm the engine controls were in the full forward position and when looking outside again, the pilot noticed that the aircraft had drifted to the right of the runway into an adjacent paddock.

As the pilot reached over to raise the landing gear lever, the aircraft’s left wing struck a bull. The aircraft then landed in the paddock. The pilot shut down the aircraft and the occupants exited. The aircraft sustained substantial damage (Figure 1) from hitting the bull and one passenger received minor injuries. The bull was put down as a result of the injuries it sustained.

Figure 1: Aircraft damage

Source: Pilot

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

2 The final nose-up of a landing aircraft to reduce the rate of descent to about zero at touchdown.

Bird attraction source

The pilot reported that, due to the recent rain, the grass surrounding the airstrip had not been mowed and was knee-high in length. The birds had been concealed by the grass. Also, there was a reasonable amount of low lying water in the paddock next to the runway.

Pilot comments

The pilot provided the following comments regarding the accident:

- With hindsight, he would have continued the landing. However, if the birds were observed earlier in the approach, he would have initiated a go-around earlier.
- As the aircraft was hangared at Hedlow, the pilot operated from the airstrip on a regular basis. The pilot stated that, even if you are familiar with an airstrip, you should consider conducting a precautionary pass over the runway to alarm animals away from the area.

Safety message

Wildlife strikes (birds and animals) resulting in aircraft damage present a significant hazard to the aviation industry.

Animal strikes can cause a relatively large amount of damage due to the size and mass of the animals involved. Research[3] conducted by the ATSB identified a total of 340 animal strikes between 2002 and 2011. Of these, the damage level was known in 217 cases. There were 13 animal strikes resulting in serious damage, including six livestock strikes. Half of these livestock occurrences were related to aircraft flying into an aerodrome that may not have had a distinct separation from the surrounding environment, such as landing in paddocks or areas adjacent to grazing paddocks where fences did not exist or were inadequate.

In addition, the research showed that more than 25 per cent of birdstrikes in general aviation resulted in damage, with aircraft wings the most commonly damaged component.

While wildlife strikes represent an ongoing challenge, and will always be present, this accident highlights the need to be aware of the hazards that may potentially exist within the vicinity of the runway and the benefits of overflying to alarm wildlife.

General details

Manufacturer and model:	Mooney Aircraft Corporation M20J	
Registration:	VH-CYK	
Type of operation:	Private	
Occurrence category:	Accident	
Primary occurrence type:	Wildlife strike	
Location:	Hedlow (ALA), Queensland	
	Latitude: 23° 13.40' S	Longitude: 150° 36.32' E
Persons on board:	Crew – 1	Passengers – 2
Injuries:	Crew – Nil	Passengers – 1 (Minor)
Damage:	Substantial	

[3] www.atsb.gov.au/publications/2012/ar-2012-031.aspx

Helicopters

Wirestrike involving Robinson R44, VH-HGF

What happened

On 23 February 2013, a Robinson R44 Raven I helicopter, registered VH-HGF, was engaged in agricultural operations in a paddock near Clarks Hill, Victoria. The pilot was the only person on board.

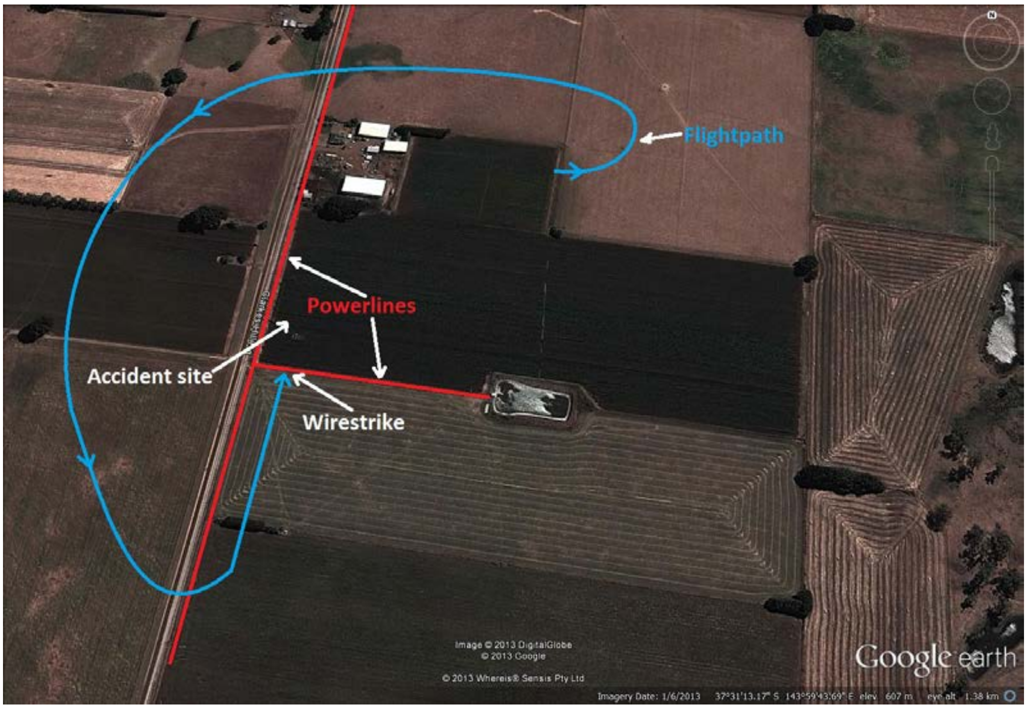
At about 0915 Eastern Daylight-saving Time,[1] the pilot changed the orientation of the application runs across the paddock from west to east, to south to north. The change in direction of the application runs was required to apply chemical to areas of the paddock that could not be sprayed on the west to east runs, due to a power line located on the western boundary of the paddock (Figure 1).

Helicopter damage

Source: Helicopter operator

As the helicopter approached the paddock from the south, at 50 kt and at spray height, the pilot remembered a wire that extended halfway across the southern boundary of the paddock to a pump house. The pilot judged that it was too late to attempt to pull up over the wire and attempted to avoid the wire by flying underneath it. The vertical stabiliser contacted the wire and the tail rotor gearbox separated from the tail boom. The nose of the helicopter momentarily pitched upwards before the helicopter began to spin to the right. The pilot closed the throttle in an attempt to recover control, but the helicopter landed hard and rolled over. The pilot was able to exit the helicopter with minor injuries. The helicopter was substantially damaged. There was no fire.

Figure 1: Accident site



Source: Google earth

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

Figure 2: Helicopter damage

Source: Helicopter operator

Pilot experience and comments

The pilot held a Commercial Pilot Licence (Helicopter) and a Grade 2 Agricultural rating. The pilot had about 1,255 hours total time and about 1,175 hours in the R44.

The pilot reported performing a thorough inspection of the paddock prior to commencing low level operations within the paddock. The pilot also commented that it was his usual practice to perform an additional hazard check prior to changing the orientation of the application runs. However, on this occasion, he did not perform this additional check. The pilot further commented that he knew the wire was there, but at the time was concentrating on other obstacles in the paddock, including an irrigator, the wire on the western boundary and tall trees located near the house (Figure1).

The pilot also reported feeling under some time pressure to complete the job prior to a forecast increase in wind speed.

ATSB comment

About 3 weeks prior to the accident, the helicopter had been fitted with bladder-type fuel tanks, in accordance with the Robinson Service Bulletin SB-78. This action reduced the risk of a post-impact fire.

A number of R44 accidents in Australia involving low-energy impacts have resulted in the all-aluminium fuel tanks being breached and a fuel-fed fire. As a result, the ATSB issued a recommendation[2] that CASA take further action to ensure that owners and operators of Robinson R44 helicopters are aware of the relevant regulatory requirements and comply with the manufacturer's service bulletin SB-78B to replace all-aluminium fuel tanks with bladder-type tanks on Robinson R44 helicopters. On 29 April 2013, CASA issued Airworthiness Directive AD/R44/23 (R44 Bladder Fuel Tank Retrofit), which required all Australian operators of R44 aircraft to comply with the Robinson Helicopter Service Bulletin SB-78B.

2 www.atsb.gov.au/publications/investigation_reports/2013/aair/ao-2013-055/issue-1.aspx

Safety message

The practice within the aerial agricultural industry is to extensively pre-plan an application task that takes into account the specific hazards affecting an application. Any change from the previously planned application runs, including an unplanned change of direction has the potential to affect a pilot's awareness of the relative position of previously known power lines and other hazards.

For this reason, the Aerial Agricultural Association of Australia recommends that an additional hazard check should be performed from a safe height prior to every change of direction or 'clean up run'. The extra safety check for wires is important, as the obstructions are new from the new direction of flight.

For further reading of suggested approaches to risk management for Agricultural Pilot please see the *Aerial Application Pilots Manual,* available from the Aerial Agricultural Association of Australia.

www.aerialag.com.au/Home.aspx

General details

Manufacturer and model:	Robinson Helicopter Company R44 Raven I	
Registration:	VH-HGF	
Type of operation:	Aerial work – aerial agriculture	
Occurrence category:	Accident	
Primary occurrence type:	Wirestrike	
Location:	18 km E of Ballarat, Victoria	
	Latitude: 37° 31.13' S	Longitude: 143° 59.43' 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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