Australian Government
Australian Transport Safety Bureau

Collision with terrain involving Cessna 206, VH-WZX

Apollo Bay Airfield, Victoria, 31 January 2018

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Aviation Occurrence Investigation
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Addendum

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Collision with terrain involving Cessna 206, VH-WZX

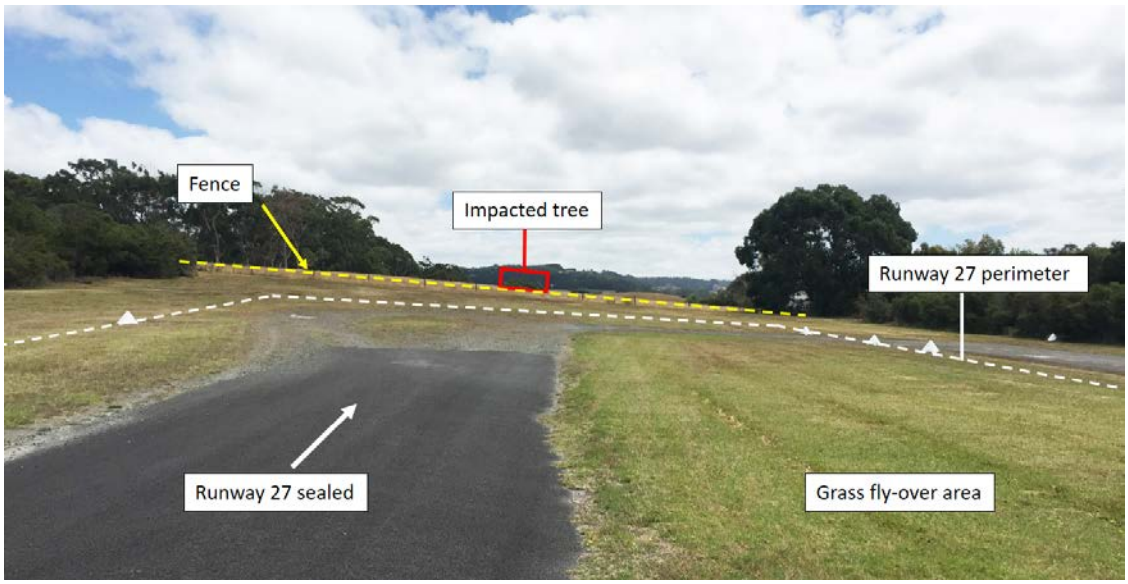
What happened

On 31 January 2018, a Cessna U206G, registered VH-WZX, was operated by Bush Pilots Australia for a charter passenger scenic flight from Apollo Bay Airfield, Victoria. The scenic flight was over the Twelve Apostles Marine National Park, Victoria, and return to Apollo Bay. There were a pilot and five passengers on board.

At about 1515 Eastern Daylight-saving Time (EDT), the flight returned to Apollo Bay. The pilot observed the windsock indicating the wind direction as varying between a south-westerly and a south-easterly and elected to use runway 27 for landing, as this provided an uphill slope.

Runway 27 was a 740 m long and 6 m wide sealed runway. A grass fly-over area adjoined the sealed runway along its northern edge (Figure 1). The runway had an overall uphill slope of 2 per cent, however, the slope was not constant along the runway. The first half of the runway had little gradient. About half way along the runway, the slope increased, before increasing further over about the final quarter of the runway. The runway ended on the upslope of a hill. About 35 m from the end of the runway, the airfield boundary was defined by a wire fence. Beyond the fence, the slope gradient reduced over clear ground for about 80 m until reaching the top of the hill. The ground then descended into a valley.

Figure 1: Western end of runway 27



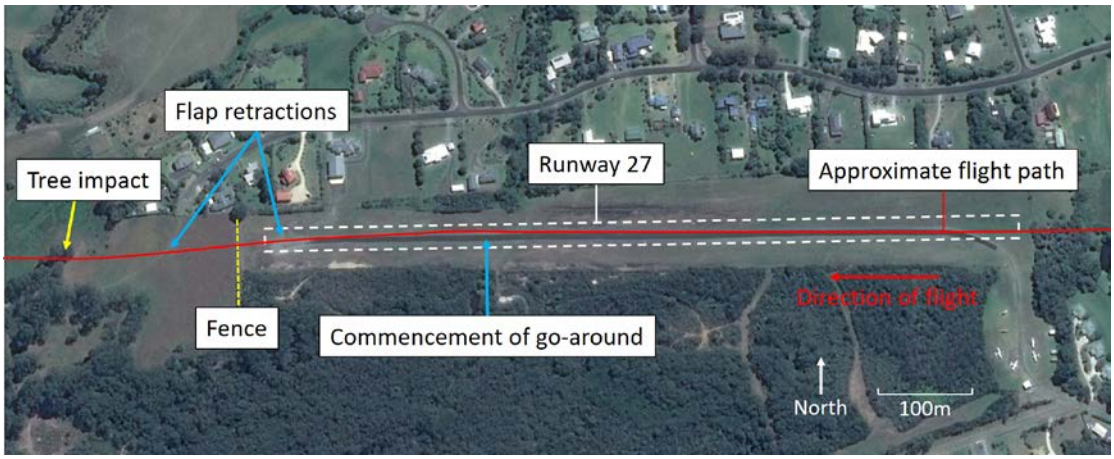
The figure shows the western end of runway 27. The sealed runway and grass fly-over area along with the fence and impacted tree are annotated. Source: Operator, annotated by ATSB

The pilot assessed the wind strength to be about 5–10 kt with gusts up to 15 kt and anticipated a left crosswind during the landing. The pilot conducted a normal approach and positioned the aircraft on the final approach leg at a speed of about 70 kt, with full flap selected.

The aircraft touched down in the normal touch down zone and bounced. The aircraft floated, and the pilot used a slight increase in power to stabilise the aircraft to complete the landing. The aircraft continued to float along the runway and drifted right, over the adjacent grass fly-over area, and a passenger reported that the aircraft bounced a second time. With about one quarter of the runway remaining, the aircraft touched down on the grass and again bounced.

Assessing that insufficient runway length remained to complete the landing, the pilot elected to conduct a go-around (Figure 2). The pilot applied full power and recalled the aircraft nose pitched up to a high attitude. The pilot observed that the aircraft did not climb away from the rising ground as expected, and as the aircraft passed the end of the runway at low height, he retracted the flaps one stage to 20 degrees in an attempt to improve climb performance. The aircraft did not climb sufficiently to clear the airfield boundary fence and the left undercarriage leg struck the fence, sustaining minor damage, including fracturing the brake line.

Figure 2: Overview of the attempted landing and go-around



The figure shows an overview of runway 27, approximate locations of significant events during the incident landing and go-around are annotated. Source: Google earth, annotated by ATSB

After striking the fence, the aircraft continued flying. The upslope on the hill reduced and then the ground started to descend into a valley. The pilot advised that the climb performance degraded and he elected to retract the flaps a further stage to 10 degrees. The flap retraction resulted in a significant loss of lift and the aircraft descended. The pilot identified trees in front of the aircraft and banked the aircraft right to turn away from a larger group of trees. While turning, the right wingtip struck the canopy of a single tree positioned about 225 m beyond the end of runway 27.

After impacting the tree, the aircraft accelerated over the descending terrain and then began to climb. The pilot then completed a left circuit for runway 27 and landed without further incident.

No persons were injured during the incident and the aircraft sustained minor damage to the left main landing gear and right wing (Figure 3).

Figure 3: Damage to VH-WZX

The figure shows the damage to the right wing (left) and left main undercarriage (right). Source: Operator, annotated by ATSB

Aircraft loading

The aircraft was fitted with five passenger seats and had a maximum take-off weight of 1,633 kg.

The incident flight was one of two similar flights booked on the day by a group of nine passengers, five women and four men. The operator and a passenger both commented that the average

weight of the men was notably heavier than the women. The pilot elected to load the four men along with one woman on the first flight, leaving the remaining four women for the second flight.

Prior to the first flight, the pilot fuelled the aircraft to a total of 180 L and anticipated using 40 L (29 kg) of fuel on each flight. He did not plan to refuel the aircraft after the first flight.

The pilot calculated the weight and balance for the incident flight using the actual weights of the occupants and determined the aircraft to be within weight and balance limits with a take-off weight of 1,622 kg.

The incident flight departed with a combination of a heavier passenger load and higher fuel load than that planned for the second flight.

Aircraft information

The Cessna U206G aircraft flight manual provides a target speed range of 65 kt to 75 kt for landing.

The manual also contained the following guidance for conducting a go-around:

> In a balked landing (go-around) climb, the wing flap setting should be reduced to 20 degrees immediately after full power is applied. After all obstacles are cleared and a safe altitude and airspeed[1] are obtained, the wing flaps should be retracted.

Pilot comments

The pilot of the aircraft provided the following comments:

- The target speed for the approach was 70 kt, however, the pilot could not recall the speed of the aircraft during the late stages of the approach and at the commencement of the flare.
- The floating after the initial touchdown and bounce may have been caused by a wind change or excessive speed.
- After the second bounce, he did consider attempting to stop the aircraft, but assessed that insufficient runway remained and elected to go-around.

Operator comment

The operator of the aircraft provided the following comments:

- While the flight was within weight and balance limits, the passenger load should have been distributed more evenly across the two flights. This would have increased available aircraft performance and operational margins.
- The manufacturer's target speed of 80 kt for flap retraction during a go-around could only be achieved with a light aircraft weight.

Safety analysis

After the initial bounce and the aircraft's right-drift off the sealed runway, the pilot did not commence a go-around. The aircraft continued to float over the grass fly-over area until, with about a quarter of the runway remaining, the aircraft again bounced before the pilot elected to go-around.

After commencing the go-around, the pilot did not immediately follow the go-around procedure to retract the flaps to the 20-degree positon as directed by the aeroplane flight manual. It is likely this, combined with the upslope of the runway and the heavy load of the aircraft, prevented the aircraft from climbing sufficiently to clear the airfield boundary fence.

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[1] The checklist procedure contained in the aircraft flight manual directed that the aircraft should be accelerated to 80 kt before the wing flaps are retracted.

After the aircraft struck the fence, the pilot did not follow the correct go-around procedure and raised the flaps to 10 degrees before allowing the aircraft speed to increase and ensuring all obstacles had been cleared. The flap retraction resulted in a loss of lift which led to the aircraft descending and impacting the canopy of a tree 225 m beyond the airfield boundary fence.

Findings

These findings should not be read as apportioning blame or liability to any particular organisation or individual.

- The go-around commenced late during the landing and the pilot did not immediately follow the go-around procedure. These factors, combined with the heavy aircraft weight and rising terrain, reduced obstacle clearance and the aircraft struck the airfield boundary fence.
- After the aircraft struck the fence, the go-around procedure was not followed and the flaps were retracted to the 10-degree setting. Following the flap retraction, the aircraft descended and struck the canopy of a tree.

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 are taking the following safety actions:

Change to procedure

- For scenic flights requiring runway 27 at Apollo Bay for departure or arrival, the maximum take-off weight has been restricted to 1,563 kg.

Safety message

This incident underlines the importance of electing to commence a go-around early when the approach and landing deviate from the plan and a safe landing cannot be assured.

The United States Federal Aviation Administration publication: *Airplane Flying Handbook, Chapter eight Approaches and Landings* provides the following information for pilots who encounter floating during landing:

> The recovery from floating is dependent upon the amount of floating and the effect of any crosswind, as well as the amount of runway remaining. Since prolonged floating utilizes considerable runway length, it must be avoided especially on short runways or in strong crosswinds. If a landing cannot be made on the first third of the runway, or the airplane drifts sideways, execute a go-around.

The Civil Aviation Authority of New Zealand publication: *Mountain Flying* provides further guidance for pilots operating into airfields where runway slope and surrounding terrain are significant considerations:

> Always have a clearly defined decision point where you can go-around if you are not happy that a safe landing is achievable.

Also highlighted is the importance of following the correct procedure once a go-around has been commenced. Following the correct procedure is critical in ensuring that the aircraft can achieve maximum climb performance and obstacle clearance.

Chapter eight of the *Airplane Flying Handbook* provides the following guidance for managing the aircraft's configuration during the go-around.

After the descent has been stopped, the landing flaps are partially retracted or placed in the take-off position as recommended by the manufacturer. Caution must be used in retracting the flaps. Depending on the airplane's altitude and airspeed, it is wise to retract the flaps intermittently in small increments to allow time for the airplane to accelerate progressively as they are being raised. A sudden and complete retraction of the flaps could cause a loss of lift resulting in the airplane settling into the ground.

General details

Occurrence details

Date and time:	31 January 2018 – 1515 EDT	
Occurrence category:	Serious incident	
Primary occurrence type:	Collision with terrain	
Location:	Apollo Bay Airfield, Victoria	
	Latitude: 38° 46.37' S	Longitude: 143° 39.42' E

Aircraft details

Manufacturer and model:	Cessna Aircraft Company U206G	
Registration:	VH-WZX	
Operator:	Bush Pilots Australia	
Serial number:	U20605982	
Type of operation:	Charter passenger	
Persons on board:	Crew – 1	Passengers – 5
Injuries:	Crew – Nil	Passengers – Nil
Aircraft damage:	Minor	

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB 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; and 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 operations involving the travelling public.

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.

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.

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 report

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, a limited-scope, fact-gathering investigation was conducted in order to produce a short summary report, and allow for greater industry awareness of potential safety issues and possible safety actions.