



Australian Government

Australian Transport Safety Bureau

Collision with terrain involving a Robinson R44, VH-UGC

Mount Buller, Victoria, 6 November 2013

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Addendum

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Collision with terrain involving a Robinson R44, VH-UGC

What happened

On 6 November 2013, the pilot of a Robinson R44 helicopter, registered VH-UGC, was conducting a private flight from the Latrobe Valley to Mount Buller, Victoria with three passengers on board.

At about 1425 Eastern Daylight-savings Time (EDT),¹ the helicopter arrived overhead the Mount Buller Township. Two orbits at about 500 ft above ground level (AGL) were conducted to assess the landing area (helipad), the wind conditions and confirm the outside air temperature.

The pilot then commenced an approach to the helipad. When in an out-of-ground-effect hover,² he conducted a power check at 21 inches hg manifold pressure. He then reduced the engine power to 18 inches hg and reported that, when about 30 m from the helipad, the helicopter became a bit unstable. He then raised the collective,³ but the engine appeared to lose power. He attempted to increase the power, but the engine appeared not to respond.

As the front of the helicopter's skids were about to touch down, the pilot applied full forward cyclic,⁴ and reported experiencing mast bump.⁵ In response, he raised the collective. The low rotor revolutions per minute (RRPM) horn then sounded and the pilot reported that the helicopter felt as if it was going to fall backwards. The helicopter rolled onto its side and came to rest about 9 m down an embankment. The helicopter was substantially damaged⁶ (Figure 1) and the pilot and passengers were able to exit the helicopter uninjured.

Figure 1: Damage to VH-UGC



Source: Victoria Police

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

² When hovering within about one rotor diameter of the ground, the performance of the main rotor is affected by ground effect. A helicopter hovering in-ground-effect (IGE) requires less engine power to hover than a helicopter hovering out-of-ground-effect (OGE).

³ The collective pitch control, or collective, is a primary flight control used to make changes to the pitch angle of the main rotor blades. Collective input is the main control for vertical velocity.

⁴ The cyclic pitch control, or cyclic, is a primary flight control that allows the pilot to fly the helicopter in any direction of travel: forward, rearward, left, and right.

⁵ Mast bumping occurs when the helicopter's main rotor hub makes contact with and deforms the main rotor mast.

⁶ The helicopter had been fitted with bladder fuel tanks.

ATSB comment

To maintain a steady hover, an increase in the weight of the helicopter requires more engine power. Increases in altitude and temperature reduce air density, and consequently the engine’s ability to produce power.

Mount Buller helipad was at an elevation of 5,400 ft above mean sea level. The pilot reported that the helicopter was at a gross weight of about 1,048 kg when it landed. When the pilot attempted to increase power, the engine was already producing the maximum continuous power available for the altitude and prevailing conditions.

Pilot comments

The pilot provided the following comments:

- in preparation for the flight, the pilot referred to the helicopter’s operating handbook and calculated that the flight would be conducted within the IGE and OGE hover limitations
- he had flown to Mount Buller about 20 times previously
- he had done his Helicopter Flight Review the previous day and practiced autorotations and other emergency procedures.

Safety message

The helicopter had been fitted with bladder fuel tanks. Despite the hard landing and resulting substantial damage to the helicopter, there was no post-impact fire and the pilot and all passengers were able to exit the helicopter uninjured.

This incident highlights the effect of gross weight and airfield elevation on aircraft performance. Understanding the controllability issues at the limits of the normal operating envelope can assist pilots in recognising the symptoms of reduced aircraft performance. Further information is available in the following ATSB report:

www.atsb.gov.au/publications/investigation_reports/2006/aair/aair200600979.aspx

General details

Occurrence details

Date and time:	6 November 2013 –1426 EDT	
Occurrence category:	Accident	
Primary occurrence type:	Collision with terrain	
Location:	Mount Buller, Victoria	
	Latitude: 37° 09.20' S	Longitude: 146° 27.50' E

Helicopter details

Manufacturer and model:	Robinson Helicopter Company R44 II	
Registration:	VH-UGC	
Serial number:	12051	
Type of operation:	Private	
Persons on board:	Crew – 1	Passengers – 3
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Substantial	

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 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.

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.