Australian Government
Australian Transport Safety Bureau

Loss of control involving Robinson R22, VH-EGN

Camden Airport, New South Wales, 7 August 2013

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Aviation Occurrence Investigation
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Addendum

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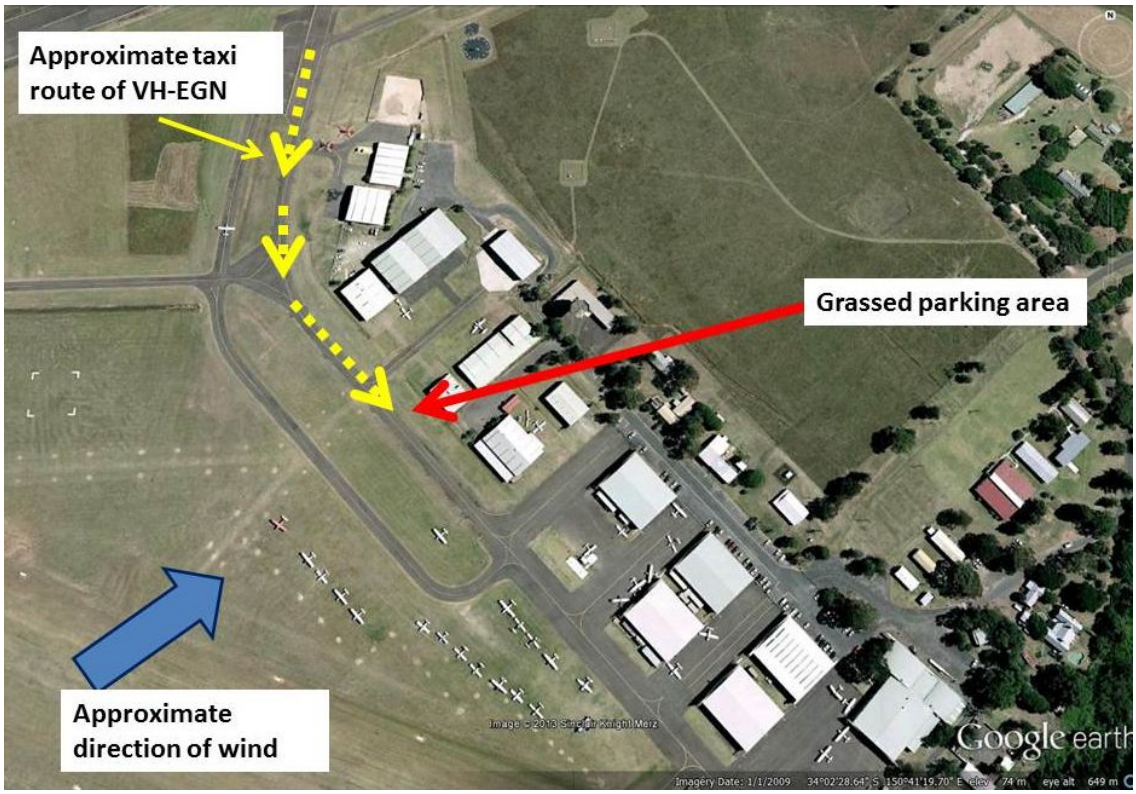
Loss of control involving a Robinson R22, VH-EGN

What happened

On 7 August 2013, at about 0800 Eastern Standard Time (EST),[1] the student pilot of a Robinson R22 helicopter, registered VH-EGN (EGN), commenced his first training flight for the day at Camden Airport, New South Wales. The flight involved a dual check, followed by solo circuit practice. After the circuit practice, the student returned to the grassed parking area near the flying school hangar (Figure 1) and parked EGN facing east, as briefed by his instructor. This manoeuvre was observed by his instructor.

After a break, and a further briefing by his instructor highlighting turning and downwind operations, including instructions for returning to the grassed parking area, the student departed for his second training flight of solo circuits. His instructor observed the departure and the majority of the solo session, as he was airborne in another company helicopter also conducting circuits. Throughout the training session, the Bureau of Meteorology automatic weather station (AWS) indicated that the wind was predominantly west-south-westerly, between 6-10 kt.

Figure 1: Camden Airport



Source: Google earth

At the end of the solo circuits, the student taxied EGN back toward the hangar and reported the wind was coming from his right. At about 1055, the helicopter approached the parking area. While facing an easterly direction and hovering at about 3 ft above ground level, the student commenced a left pedal turn at low airspeed to position the helicopter in a westerly direction for landing.

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

The helicopter commenced turning left. When in a downwind position, the student reported that the helicopter weather-cocked into wind and the rotational speed rapidly increased. The student attempted to stop the rotation by applying full right pedal, but the helicopter continued to rotate left. The student lowered[2] the collective to land EGN and the right skid contacted the ground followed by the tail rotor.

The helicopter was shut down and the student exited. The student was not injured, but the helicopter sustained substantial damage (Figure 2).

Figure 2: VH-EGN damage

Source: Peter Holstein

Pilot experience and comments

The pilot held a Student Pilot Licence, with about 36 hours total time, of which 29 hours were on the Robinson R22 helicopter, including 4 hours of solo time. In the last 90 days, the student had accrued 5 hours on the R22.

The student said that he had been briefed on the conditions that could lead to weathercocking and had also noticed his instructor responding to this effect in much stronger wind conditions during dual training. He reported that he had been cautious in applying left pedal to turn the helicopter and did not believe that the relatively benign weather conditions would be sufficient to induce a weathercocking event. In addition, he had also successfully taxied to and from the hangar and parked on his own, on two occasions prior to the accident flight.

The student reported that he intends to undertake more dual hover training in various wind conditions to become proficient in identifying a potential weather cock situation.

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[2] In the absence of any other control inputs, when the collective is lowered the helicopter will yaw left.

Operator comment

The operator reported that it was company procedure to accompany student pilots to/from the hangar (with an instructor remaining in the vicinity of the main helipad) for at least the first 3 hours of solo flying.

Weathercock stability

The United States Federal Aviation Administration (FAA) *Helicopter Flying Handbook*[3] states that the nose of a helicopter will attempt to weathercock into the relative wind when a tailwind from 120° to 240° is experienced. If sufficient resisting pedal input is not made by the pilot, the helicopter will start a slow, uncommanded turn to either the left or right, depending on the wind direction. If the yaw rate is allowed to develop and the tail of the helicopter moves into this region, the yaw rate can accelerate rapidly.

The FAA further stated that, when approaching the downwind portion of a turn, anticipate the helicopter's tendency to weathercock by applying pedal pressure opposite to the direction of the turn.

Safety action

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

Operator

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

Operations Manual amendment

The operator has amended Part E of their Operations Manual to extend the time that a student pilot is monitored by an instructor returning to the parking area at the hangar. The new amendment now states:

> Annex 1 Section E2.25 TAXIING BY STUDENT PILOTS
>
> Solo taxi by student pilots shall only be permitted after 'first solo'. At all other times, taxiing shall be conducted as part of dual training under the strict supervision of an approved helicopter instructor. Student pilots may only return to the hangar parking area after having completed a minimum of 5 hours taxiing to/from hangar dual with an instructor on-board after having achieved First Solo.

Accident review

The operator's instructional staff have reviewed the accident and discussed the lessons learnt from the experience.

Safety message

Wind direction and velocity are important considerations for helicopter pilots, especially for hovering take-off and climb performance. When the wind strikes the aircraft from certain sectors, a sudden reduction in tail rotor efficiency can occur. If the helicopter is allowed to rotate or turn through certain wind directions, the rate of turn may accelerate. It is crucial that pilots maintain an awareness of the wind and be aware of the consequential effects on helicopter performance. This will assist pilots with responding promptly and appropriately to a situation and preventing a loss of control.

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[3] www.faa.gov/regulations_policies/handbooks_manuals/aviation/helicopter_flying_handbook/

General details

Occurrence details

Date and time:	7 August 2013 – 1055 EST	
Occurrence category:	Accident	
Primary occurrence type:	Aircraft loss of control	
Location:	Camden Airport, New South Wales	
	Latitude: 34° 02.42' S	Longitude: 150° 41.23' E

Helicopter details

Manufacturer and model:	Robinson Helicopter Company R22 BETA	
Registration:	VH-EGN	
Serial number:	4538	
Type of operation:	Flying Training	
Persons on board:	Crew – 1	Passengers – Nil
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.