Australian Government
Australian Transport Safety Bureau

Collision with terrain involving Airbus Helicopters EC130 T2, VH-XWD

near Mount Disappointment, Victoria, on 31 March 2022

ATSB Transport Safety Report
Aviation Occurrence Investigation
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Addendum

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Preliminary report

This preliminary report details factual information established in the investigation's early evidence collection phase and has been prepared to provide timely information to the industry and public. Preliminary reports contain no analysis or findings, which will be detailed in the investigation's final report. The information contained in this preliminary report is released in accordance with section 25 of the *Transport Safety Investigation Act 2003*.

The occurrence

On 31 March 2022, at about 0709 Eastern Daylight-saving Time,[1] an Airbus Helicopters EC130 T2, registered VH-XWD (XWD) and operated by Microflite, departed Moorabbin Airport for Batman Park Heliport, Melbourne City, Victoria, with one pilot on board. XWD departed Moorabbin Airport in trail,[2] 10 seconds behind another company EC130 helicopter, registered VH-WVV (WVV).[3]

At about 0717, the helicopters landed at Batman Park and were shut down (Figure 1). The pilots then proceeded to the operator's heliport office to meet a charter group of 8 passengers for a business trip. They provided the passengers with a safety briefing and escorted them to the helicopters where they were divided into 2 smaller groups of 4 passengers for each helicopter.

Figure 1: VH-XWD (left) and VH-WVV (right) at Batman Park Heliport

Source: Operator, through Victoria Police

At about 0741, WVV departed from Batman Park with XWD in a 30 second trail. Both were operating as visual flight rules (VFR)[4] outside controlled airspace. They initially headed east to remain outside controlled airspace before turning north towards their planned destination, Ulupna, in the north of Victoria. As they tracked east and then north, the lower limit of uncontrolled

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

2 In trail: following the flight path of the aircraft ahead.

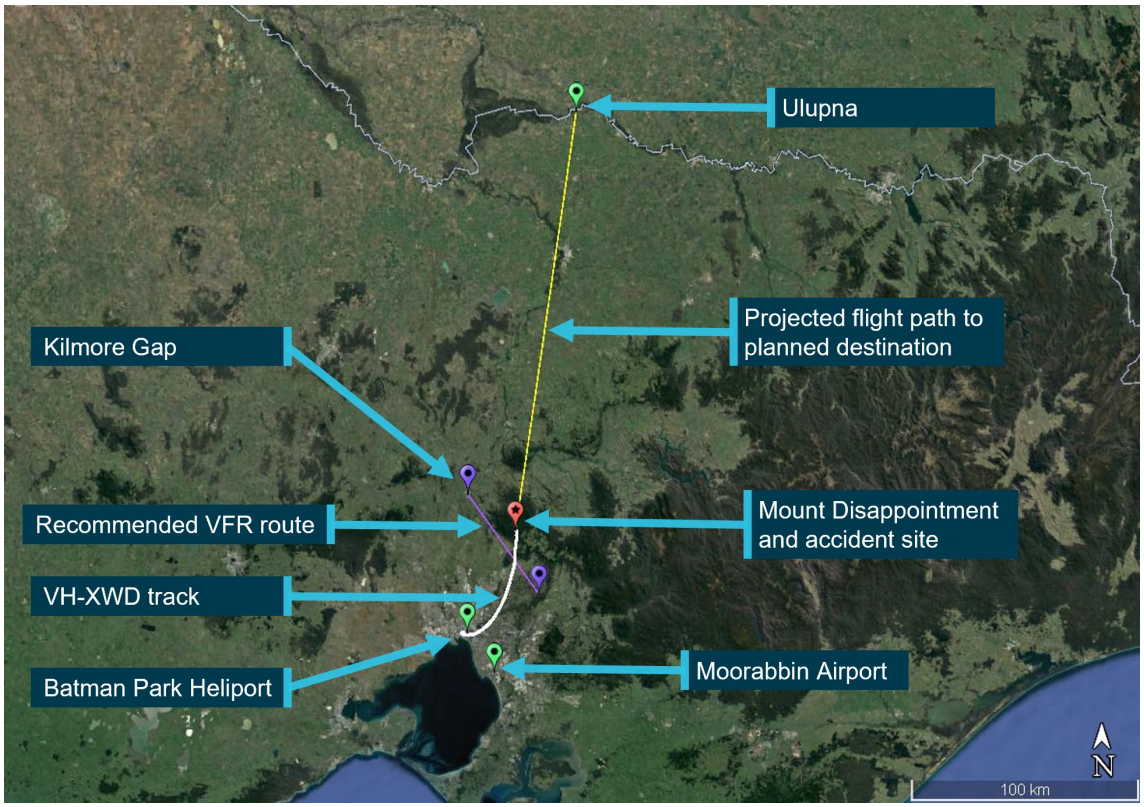
3 The flight data for VH-XWD was OzRunways, which rounded altitude data to the nearest 100 ft. The flight data for VH-WVV was TracPlus, which provided altitude data to the nearest foot.

4 Visual flight rules (VFR): a set of regulations that permit a pilot to operate an aircraft only in weather conditions generally clear enough to allow the pilot to see where the aircraft is going.

airspace increased, and the helicopters climbed from 1,500 ft above mean sea level (AMSL) to 2,500 ft and then to 3,500 ft.

At interview, the pilot on board WVV recalled that there was scattered[5] cloud at 1,500 ft on the forecast that would not allow them to track below cloud via the recommended VFR route to Kilmore Gap (elevation 1,200 ft AMSL). Therefore, they elected to take a more direct track to their destination, which took them over Mount Disappointment, to the east of Kilmore Gap (Figure 2). While tracking north towards Mount Disappointment, the helicopters were above a layer of scattered cloud with an estimated top of 2,500-3,000 ft and below a layer of broken cloud with an estimated base of about 4,500 ft. The pilot of WVV reported that they could see areas of sunlight striking the ground ahead of them, and therefore considered the weather ahead suitable to continue.

Figure 2: VH-XWD flight track and key locations



Source: Google Earth and OzRunways, annotated by the ATSB

As they approached Mount Disappointment, XWD was in a 1.5 NM (3 km) trail behind WVV, and the helicopters were cruising at an altitude of about 3,500 ft and 120 kt ground speed. At this stage, the pilot of WVV noted the layer of scattered cloud below them was becoming broken,[5] that the tops were rising, and that the base of the cloud above them appeared to be lowering, resulting in the 2 layers of cloud appearing to converge ahead of them.

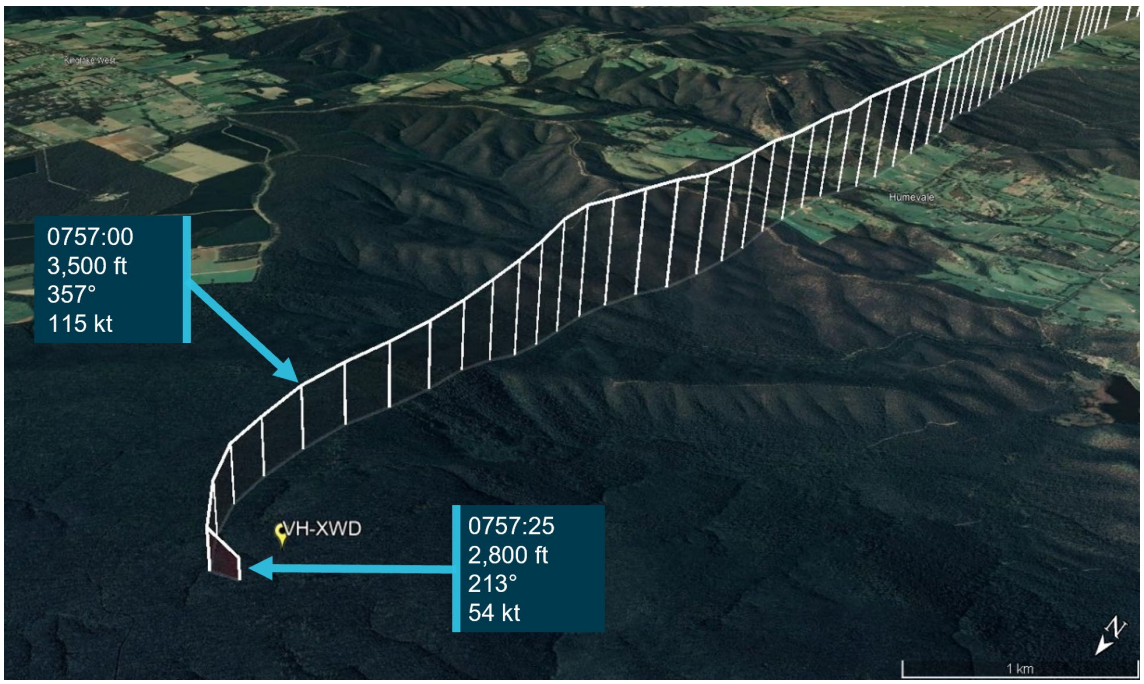
Before they could cross Mount Disappointment, the pilot of WVV reported they were confronted with a 'wall of cloud' in front, and to the left and right of their track, and broadcast to XWD their intention to turn around. The pilot of WVV reported that the pilot of XWD may have been confused by this broadcast and thought the conditions were suitable to continue. The pilot of WVV reported they then broadcast 'U-turn, U-turn, U-turn' to XWD. At about 0756:30, the pilot of WVV conducted a sharp left turn onto a southerly track at 3,635 ft. At about 0757:00, XWD passed below and to

[5] Cloud cover: cloud cover is reported using words that denote the extent of the cover – 'few' indicates that cloud is covering less than a quarter of the sky, 'scattered' indicates that cloud is covering between a quarter and a half of the sky, 'broken' indicates that more than half to almost all the sky is covered.

the left of WVV, with XWD continuing to track north at about 3,500 ft and 115 kt. This was the last visual contact the occupants of WVV had with XWD.

At 0757:15, the pilot of WVV found a clearing through cloud and turned back northbound at 3,957 ft, with a clearance from air traffic control to climb to not above 5,000 ft. At the same time, the flight data for XWD indicated a track of 333° at 3,300 ft and 100 kt. At 0757:20, XWD was on a track of 297° at about 3,100 ft and 91 kt. The last recorded data point was at 0757:25, at which time XWD had a track of 213° at about 2,800 ft and 54 kt (Figure 3). XWD collided with terrain about 250 m south of the last recorded data point. The elevation of the main wreckage site was about 2,359 ft (719 m). The 5 occupants were fatally injured, and the helicopter was destroyed.

Figure 3: VH-XWD flight track and accident site



Source: Google Earth and OzRunways, annotated by the ATSB

Context

Helicopter information

The accident helicopter was an Airbus Helicopters EC130 T2 manufactured in 2017 and equipped with a Safran Arriel 2D turboshaft engine, 3-bladed main rotor and Fenestron[6] tail rotor. The helicopter was registered VH-XWD in Australia in August 2019 in the night VFR operational category. It was configured with 3 seats in the front row and 4 seats in the rear row. The pilot's seat was front left.

Wreckage and impact information

The ATSB's site survey established that XWD had impacted a large old growth tree (Figure 4), which broke the upper tree trunk and severely disrupted the cabin. The helicopter then descended on a southerly trajectory at an angle of about 45° to ground impact. The vegetation surrounding the accident site was comprised of 2 distinct levels of growth. A new growth canopy that had an average height of 24 m, and old growth trees that had an average height of about 70 m. The old growth tree break was about 41 m above ground level (elevation of 759 m). The elevation of the base of this tree was 718 m, which indicated that the elevation of the top of the tree was likely

[6] A Fenestron is an enclosed helicopter tail rotor.

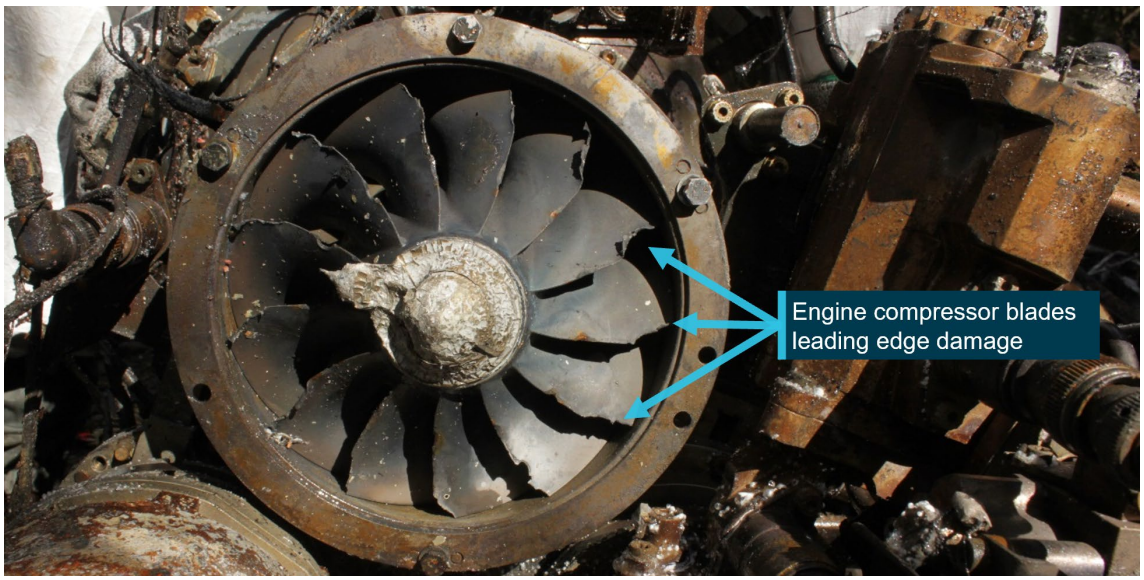
about 2,585 ft (788 m). Therefore, the tree impact very likely occurred between 2,490–2,585 ft (759–788 m).

Figure 4: Overhead view of old growth tree break and main wreckage site

Source: ATSB

The helicopter was subject to a post-impact fire, resulting in the destruction of some components. However, from the components available there was no evidence to indicate any pre-existing defect that would have prevented normal operation. The engine had disconnected from both the main rotor and Fenestron driveshafts. The Fenestron driveshaft exhibited significant scoring damage, which indicated it was rotating at high speed during the accident sequence. Damage to the leading edges of the engine compressor blades was also characteristic of high-speed rotation (Figure 5). In addition, the power turbine exhibited blade shedding.

Figure 5: Damage to the engine compressor blades



Source: ATSB

The ATSB retrieved the pilot's electronic flight bag (iPad), an Appareo camera, the vehicle and engine multi-function display, a Garmin GTN 750 global positioning system, the engine electronic control unit, and the central warning panel. The engine data recorder fitted to the helicopter was not found within the wreckage.

Meteorological information

The graphical area forecast for Victoria, current at the time of the departure, was issued at 0321 on the morning of the accident and was valid from 0400-1000. The forecast divided the state into 4 areas, identified as A, B, C and D. The flight was planned to start in area C and end in area A. The forecast for cloud in area C was for a broken layer from 2,000-3,000 ft and a broken layer from 3,000-8,000 ft. Area A was forecast to have few cloud from 3,000-5,000 ft.

Kilmore Gap was in area C and identified as a critical location.[7] The cloud forecast for Kilmore Gap was for a broken layer at 3,000 ft with TEMPO[8] conditions from 0600-1000 for a broken layer at 1,200 ft with the note 'CLD ON GND' [cloud on the ground].

The Bureau of Meteorology Kilmore Gap web camera was located 19 km west-north-west of the accident site and depicted cloud overhead Mount Disappointment prior to the time of the accident. At 0758, at Kilmore Gap, the relative humidity was 95% and the wind was 17 kt from 171°. The cloud cover was few at 394 ft and broken at 3,510 ft above ground level. At 0811 the cloud had become broken at 394 ft above ground level.

VH-WVV passenger reports

The passenger in the front middle seat had flown regularly with the pilot of WVV and considered the pilot to be very cautious regarding the weather. The passenger recalled that, during the flight, the pilot radioed XWD about the approaching weather. A 'wispy cloud then went past us, and it felt like a heavy white cloud came down and dumped on us'.

The passenger in the front right seat had flown in helicopters for about 30 years. The passenger recalled that, as they crossed Mount Disappointment, heavy cloud rolled in resulting in 'a white-out with ground visibility no longer evident'. The pilot radioed XWD and said words to the effect of 'U-turn, U-turn, U-turn'. Then the pilot of WVV immediately completed a U-turn. The pilot of XWD radioed back with words to the effect 'aren't we going to cut through?' The passenger then saw XWD pass just below them.

The passenger seated behind the pilot had flown once previously with the pilot of WVV and found them to be very professional and relaxed. During the flight, the passenger was reading emails but noted as they approached Mount Disappointment that the pilot's body language had changed, which gave the passenger the feeling that something was not right. The passenger looked outside and saw cloud in front and to the left, and then heard the pilot announce they were going 'hard left'. When the passenger next looked outside, they 'could not see anything, it was like a white-out'. The passenger then felt the helicopter in a hard left turn.

Further investigation

To date, the ATSB has examined the accident site and wreckage; collected meteorological data from the Bureau of Meteorology; visited the operator to conduct interviews, and collect operational and maintenance data; and liaised with Victoria Police, and the French Bureau of Enquiry and Analysis for Civil Aviation Safety (BEA) as the accredited representative for the helicopter and engine manufacturers.

The investigation is continuing and will include:

- download and analysis of the electronic items retrieved from the accident site

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[7] A critical location is defined as a pass or gap through a mountain range which may be available for use by VFR pilots when poor conditions prohibit flight across the ranges elsewhere. The main concern at these locations is whether the pilot can fly over these regions under VFR.

[8] TEMPO: a temporary deterioration in the forecast weather conditions, during which significant variation in prevailing conditions are expected to last for periods of between 30 and 60 minutes.

- analysis of the meteorological data
- analysis of the wreckage examination
- helicopter maintenance history
- evaluating witness information
- review of the pilot's qualifications, experience, and medical information
- review of the operator's management systems
- review of commercial helicopter pilot training and flight review requirements
- similar occurrences.

Should a critical safety issue be identified during the course of the investigation, the ATSB will immediately notify relevant parties so appropriate and timely safety action can be taken.

A final report will be released at the conclusion of the investigation.

Acknowledgements

The ATSB acknowledges the assistance provided by Victoria Police, Victoria State Emergency Services, the operator, and the French Bureau of Enquiry and Analysis for Civil Aviation Safety.

General details

Occurrence details

Date and time:	31 March 2022 – 0758 EDT	
Occurrence class:	Accident	
Occurrence categories:	Collision with terrain	
Location:	49.2 km 168º from Puckapunyal, Victoria	
	Latitude: 37º 25.961' S	Longitude: 145º 10.813' E

Aircraft details

Manufacturer and model:	Airbus Helicopters EC130 T2	
Registration:	VH-XWD	
Operator:	Microflite PTY LTD	
Serial number:	8345	
Type of operation:	Part 133 Air transport operations - Rotorcraft	
Activity	Commercial air transport – Non-scheduled – Passenger transport charters	
Departure:	Batman Park Heliport, Victoria	
Destination:	Ulupna, Victoria	
Persons on board:	Crew – 1	Passengers – 4
Injuries:	Crew – 1 (fatal)	Passengers – 4 (fatal)
Aircraft damage:	Destroyed	