



Australian Government

Australian Transport Safety Bureau

Collision with terrain involving Robinson R22, VH-LOS

36 km south of Ramingining, Northern Territory, on 14 November 2022

ATSB Transport Safety Report

Aviation Occurrence Investigation (Short)

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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 14 November 2022, a Robinson Helicopter Company R22 Beta, registered VH-LOS, was being operated near the Arafura Swamp, approximately 30 km south of Ramingining Aerodrome (YRNG), Northern Territory (Figure 1). The helicopter was being used as part of an animal mustering operation, which also included multiple land vehicles.

Figure 1: Map showing location of Ramingining and accident site of VH-LOS



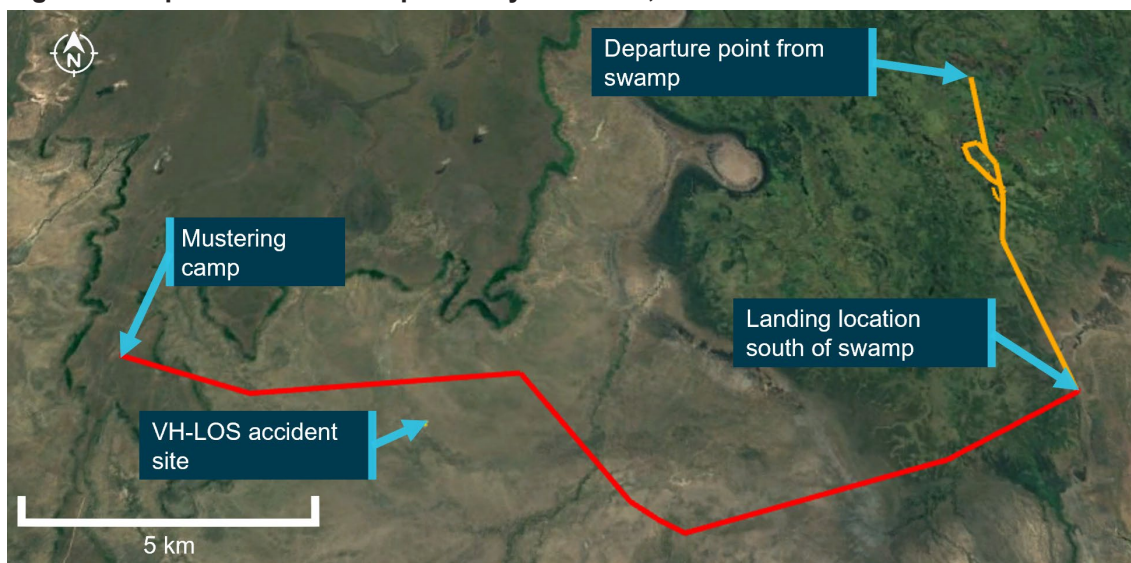
Source: Google Earth, annotated by the ATSB

At approximately 1800 local time, the mustering operation concluded for the day. While the land vehicles departed the swamp and headed to a camp location approximately 20 km to the west, the pilot of VH-LOS remained at the swamp with the helicopter. A witness recalled that they expected the pilot to depart the swamp soon after the land vehicles left. The pilot was expected to collect another member of the mustering operations from a location near the swamp, before returning to the mustering camp.

Meanwhile, the mustering group member who planned to meet the helicopter travelled from the swamp towards the planned meeting point, which was south of the swamp. They recalled it took about 30 minutes to reach the planned meeting point. They waited for about 10 minutes, before deciding to return to camp in their land vehicle when the helicopter did not arrive.

Flight tracking information showed VH-LOS took off from the swamp at 1803, and was flown around the swamp before tracking to the south and shutting down at 1812. The helicopter was then started at 1837, and was flown to the mustering camp, landing and shutting down at 1854. The track of these flights is shown in Figure 2. The flight tracking information showed the helicopter was started at 1921, before the flight tracking record ended about 1 minute later when the helicopter was still at the mustering camp.

Figure 2: Map of Arafura Swamp and key locations, and track of VH-LOS



The yellow track shows the flight departing from Arafura Swamp at 1803 and landing south of the swamp at 1812. The red track shows the flight from the edge of the swamp to the mustering camp departing at 1837 and landing at 1854.
Source: Tracplus and Google Earth, annotated by the ATSB

When the land-based vehicles arrived at the camp, the helicopter was not there. Members of the mustering operation became increasingly concerned and commenced a land-based search at approximately 2100.

The following day, members of the mustering operation contacted some acquaintances who attended the area in helicopters and commenced an aerial search. The helicopter wreckage was located approximately 6 km from the mustering camp. The pilot was deceased and the helicopter was destroyed.

Context

Pilot information

The pilot held a Commercial Pilot Licence (Helicopter) and a valid Class 1 Aviation Medical Certificate. The pilot did not hold an instrument rating or a night visual flight rules rating. The pilot's logbook recorded over 6,000 hours total aviation experience.

Aircraft information

VH-LOS was a 2-seat Robinson Helicopter Company R22 Beta helicopter, serial number 1715, powered by a Textron Lycoming, O-320-B2C, 4-cylinder piston engine. It was manufactured in the United States in 1991, and first registered in Australia in January 1995. The helicopter was not equipped for night flight under the visual flight rules.

Weather and environment

Witnesses involved in the mustering operations at the Arafura Swamp on the afternoon of 14 November recalled that conditions were clear. They reported that there was thunderstorm activity to east of where the group were operating, however no storms passed overhead. An analysis prepared by the Bureau of Meteorology also identified a thunderstorm to the east of the accident site, moving westward during the evening.

Sunset at Ramingining on 14 November 2022 was 1905 and the end of civil twilight (last light)¹ was 1927. Civil nautical twilight² was 1953 and astronomical twilight³ was 2020. The moon was a waning gibbous, rising at 2337 with about 71.3% of the visible disk illuminated.

Site and wreckage

Examination of the wreckage indicated that VH-LOS collided with terrain at approximately 45° nose-down pitch and 30° left angle of bank. There was a short wreckage trail of about 13 m, with all helicopter parts present at the accident site and no evidence of an in-flight break-up. One main rotor blade was liberated in the collision and was found about 30 m to the right of the wreckage trail.

The tail cone and tail rotor assembly remained connected to the fuselage, however presented as deflected down and curled under the helicopter. Site examination showed that both fuel tanks remained intact and contained fuel. Damage signatures to engine rotating components indicated that the engine was operating prior to the collision with terrain. There was no post-impact fire.

Recorded data

The helicopter was fitted with an aircraft tracking unit, which recorded and transmitted the position of the aircraft to a server. The ATSB obtained records showing the recorded tracks of VH-LOS on the afternoon of 14 November, and on other dates prior to the accident. The final recorded position of the helicopter was at the mustering camp, and the aircraft tracking unit did not record the position of the helicopter prior to it colliding with the terrain at the accident site.

The ATSB recovered a handheld GPS unit from the wreckage. Preliminary analysis indicated this unit did not capture the flight on the afternoon of 14 November.

The aircraft was not fitted with a flight data recorder or cockpit voice recorder, nor was it required to be.

Further investigation

To date, the ATSB has examined the accident site and wreckage, interviewed witnesses who were involved in the mustering operations and the search of VH-LOS, and collected meteorological data, aircraft maintenance records and pilot records.

The investigation is continuing and will include further review and examination of:

- pilot records and medical information
- aircraft maintenance and flight records
- aircraft wreckage
- witness information
- meteorological data
- recorded aircraft tracking data.

¹ Geoscience Australia (GA) defined the ending of civil twilight as the instant in the evening when the centre of the sun is at a depression angle of 6° below an ideal horizon. At this time in the absence of moonlight, artificial lighting or adverse atmospheric conditions, the illumination is such that large objects may be seen but no detail is discernible.

² GA defined the ending of evening nautical twilight as the instant in the evening when the centre of the sun is at a depression angle of 12° below an ideal horizon. At this time in the absence of moonlight, artificial lighting or adverse atmospheric conditions, it is dark for normal practical purposes.

³ GA defined the ending of astronomical twilight as the instant in the evening when the centre of the sun is at a depression angle of 18° below an ideal horizon. At this time the illumination due to scattered light from the sun is less than that from starlight and other natural light sources in the sky.

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.

Acknowledgement

The ATSB wishes to acknowledge the support provided by the Northern Territory Police Force during the ATSB deployment to the accident site. The accident site was in a very remote location and the Northern Territory Police Force provided substantial logistical support to facilitate ATSB access to the accident site and the activities at the site.

General details

Occurrence details

Date and time:	14 November 2022 – after 1921 CST	
Occurrence class:	Accident	
Occurrence categories:	Collision with terrain	
Location:	36.4 km 181 degrees from Ramingining Aerodrome	
	Latitude: 12° 41.106' S	Longitude: 134° 53.388' E

Aircraft details

Manufacturer and model:	Robinson Helicopter Co, R22 Beta	
Registration:	VH-LOS	
Serial number:	1715	
Type of operation:	Aerial Work-Aerial Mustering - (Aerial Work)	
Activity:	General aviation / Recreational-Aerial work-Agricultural mustering	
Departure:	Near Arafura Swamp, Northern Territory	
Destination:	Near Arafura Swamp, Northern Territory	
Persons on board:	Crew – 1	Passengers – 0
Injuries:	Crew – 1 Fatal	Passengers – 0
Aircraft damage:	Destroyed	

Australian Transport Safety Bureau

About the ATSB

The ATSB is an independent Commonwealth Government statutory agency. It is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers.

The ATSB's purpose is to improve the safety of, and public confidence in, aviation, rail and marine transport through:

- 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, as well as participating in overseas investigations involving Australian-registered aircraft and ships. It prioritises investigations that have the potential to deliver the greatest public benefit through improvements to transport safety.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, international agreements.

Purpose of safety investigations

The objective of a safety investigation is to enhance transport safety. This is done through:

- identifying safety issues and facilitating safety action to address those issues
- providing information about occurrences and their associated safety factors to facilitate learning within the transport industry.

It is not a function of the ATSB to apportion blame or provide a means for determining 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. The ATSB does not investigate for the purpose of taking administrative, regulatory or criminal action.

Terminology

An explanation of terminology used in ATSB investigation reports is available on the ATSB website. This includes terms such as occurrence, contributing factor, other factor that increased risk, and safety issue.