Australian Government
Australian Transport Safety Bureau

Collision with terrain involving PZL Warszawa-Okecie M-18A Dromader aircraft, VH-WHR

9 km NW of Emerald Airport, Queensland, on 1 December 2017

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Published by: Australian Transport Safety Bureau
Postal address: PO Box 967, Civic Square ACT 2608
Office: 62 Northbourne Avenue Canberra, Australian Capital Territory 2601
Telephone: 1800 020 616, from overseas +61 2 6257 4150 (24 hours)
Accident and incident notification: 1800 011 034 (24 hours)
Facsimile: 02 6247 3117, from overseas +61 2 6247 3117
Email: atsbinfo@atsb.gov.au
Internet: www.atsb.gov.au

Addendum

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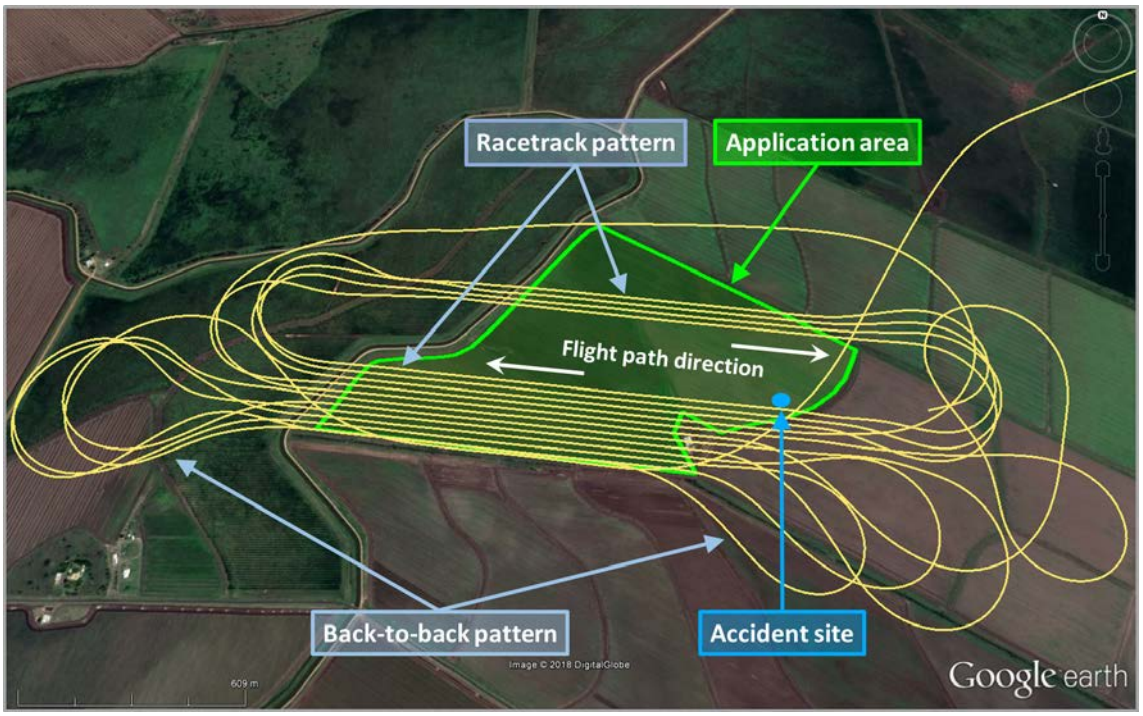
Collision with terrain involving M-18A Dromader aircraft, VH-WHR

What happened

On the morning of 1 December 2017, an M-18A Dromader aircraft (Pratt & Whitney PT6A engine), registered VH-WHR (WHR) prepared for an aerial agricultural spraying operation at a private airstrip, 9 km north of Emerald Airport, Queensland. The aircraft was operated by Central Highlands Aerial Services and was conducting a spray operation on an 81-hectare paddock (Figure 1, shown in green), about 6 km west-south-west of the airstrip.

Figure 1: Application area (green), accident site (blue) and track flown (yellow)



Source: Google earth, annotated by the ATSB

The pilot conducted a pre-flight inspection of WHR and found everything to be serviceable. He was also the last person to fly the aircraft, three days prior to the accident, and had not identified any problems.

The wind was reported to be 4-6 kt from the northeast. The spraying operation was standard with no major hazards in or around the paddock - the pilot had sprayed the paddock several times in the past conducting the same spray pattern flying east and west.

At about 0604 Eastern Standard Time,[1] the aircraft arrived at the paddock and the pilot conducted several short spray runs in the south-western corner to ensure there was no overspray onto an adjoining paddock. He then conducted several back-to-back spray runs in the same corner (Figure 1) and at about 0614, he commenced a racetrack pattern over the remainder of the paddock.

At about 0620, a witness located about 1 km from the paddock observed the aircraft complete the ninth racetrack pattern run and commence a turn to the right to line up for the next run. The witness estimated that about three quarters of the way through the turn, while lining up for the next

[1] Eastern Standard Time (EST): Coordinated Universal Time (UTC) + 10 Hours.

run, the aircraft rapidly pitched down and the right wing collided with the ground. The aircraft subsequently flipped, and came to rest inverted and facing in the opposite direction to the flight path about 20-30 m from the initial contact point (Figure 2).

Figure 2: Accident site

Source: Police

At about 0622, the witness called emergency services and proceeded to the accident site. When the witness arrived at the wreckage, he found the pilot had exited the aircraft through the broken cockpit side window.

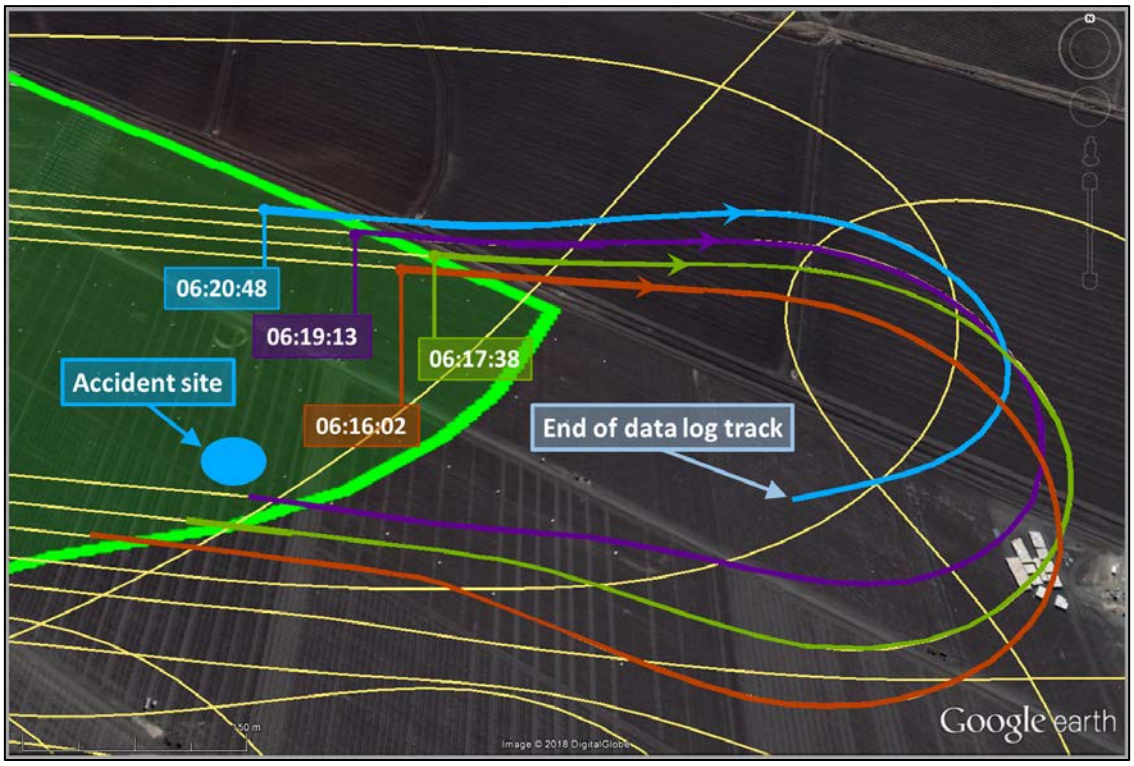
Ambulance officers treated the pilot before transporting him to hospital. He was admitted to treat his injuries, which included a fractured left leg, three fractured left ribs, bruises, cuts to his left side, and concussion. The pilot was wearing a helmet at the time of the accident and it was damaged from impact with the aircraft structure (Figure 3). The pilot had no recollection of the accident and no mechanical issue was identified that may have contributed to the accident.

Figure 3: Damage to the left side of the pilot's flight helmet

Source: Police

While the track of the aircraft during the spray operation was recorded, other parameters such as airspeed, time, altitude, and aircraft attitude were not. Figure 4 shows the final four racetrack pattern turns back towards the west. The last inbound turn (shown in blue) was conducted at a smaller turn radius than the previous three turns in that direction. The track data finished about 460 m from the accident site.

Figure 4: Final four right turns from an easterly track (last shown in blue)



Source: Google earth, annotated by the ATSB

The pilot joined the operator in January 2015, gaining about 800-flight hours in WHR (with the installed PT6A engine) and flew the previous flight in WHR three days prior to the accident. He did not report any concerns with the aircraft.

The maintenance release for WHR was issued about 40 flight hours prior to the accident and no outstanding maintenance or defects were recorded.

Safety analysis

About three quarters of the way through a turn, as the aircraft was lined up for the next racetrack pattern spray run, the aircraft was observed to rapidly pitch down and collide with the ground. Analysis of the limited available recorded data showed that the final turn was flown at a tighter radius than the previous racetrack pattern turns. In combination, this could indicate that the accident was the result of an aerodynamic stall. However, there was insufficient information to determine if that occurred.

The pilot was unable to remember the final turn and could not provide a reason for the track variation or why the aircraft pitched down. No mechanical defects were noted with the aircraft, on the maintenance release, during the previous flight, or up to the section of the accident flight the pilot could remember. A post-accident inspection of the aircraft by the operator did not identify any defects. From the limited available information, it was not possible to determine the reason for the accident.

The pilot was wearing his own personal flight helmet at the time of the accident. During the accident, the left side of the helmet struck the internals of the cockpit. Based on the degree of damage to the helmet, it probably prevented the pilot receiving more serious head injuries.

Findings

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

- During a turn, and for reasons that could not be determined, VH-WHR pitched down and collided with the ground.
- The helmet worn by the pilot probably prevented more serious head injury.

Safety message

The International Civil Aviation Organization circular 85-AN/71 *Safety in aerial work Part 1. Agricultural Operations* discusses the importance of reducing serious head injuries by wearing a correctly fitting flight helmet. Pilots operating aircraft in agricultural operations are particularly vulnerable to accidents involving major or fatal head injury. The circular also discusses the need to select a helmet which provides effective protection and that is part of the pilot's personal flying equipment as was the case in this accident.

General details

Occurrence details

Date and time:	1 December 2017 – 0621 EST	
Occurrence category:	Accident	
Primary occurrence type:	Operational / Terrain Collisions / Collision with terrain	
Location:	9 km NW of Emerald Airport, Queensland	
	Latitude: 23° 30.44' S	Longitude: 148° 07.65' E

Aircraft details – VH-WHR

Manufacturer and model:	PZL Warszawa-Okecie M-18A Dromader	
Registration:	VH-WHR	
Operator:	Central Highlands Aerial Services	
Serial number:	1Z018-07	
Type of operation:	Aerial work – Aerial agriculture	
Persons on board:	Crew – 1	Passengers – 0
Injuries:	Crew – 1	Passengers – 0
Aircraft damage:	Substantial	

About the ATSB

The 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.