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ATSB TRANSPORT SAFETY INVESTIGATION REPORT
Aviation Occurrence Investigation Report – 200601509
Final

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55 km South-west of Narrandera, NSW
Cessna 188B Agwagon, VH-ZIP
26 March 2006

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Collision with Terrain, 55 km South-west of Narrandera, NSW, Cessna 188B, VH-ZIP, 26 March 2006

Prepared by

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Abstract

On 26 March 2006, at about 1800 Eastern Daylight-saving Time, a Cessna 188B Agwagon aircraft, registered VH-ZIP, was reported to have taken off from a field adjacent to a local water-ski area, about 59 km south-west of Narrandera, NSW, with the pilot as the sole occupant. The following morning at about 0900, the aircraft wreckage was found by a passer-by at a position 55 km south of Narrandera and about 8 km from the departure area. The aircraft was destroyed, there was no fire and the pilot was fatally injured.

There was no evidence that the pilot experienced any physiological condition which could have contributed to the accident. Weather conditions in the area were reported to be fine with little or no wind and there were no overhead powerlines or other obstacles in the vicinity. The aircraft had impacted the ground heavily, in a nose-down, right wing-low attitude, consistent with a low-speed stall or aerobatic manoeuvre. There was no evidence of a flight control or systems problem which could have contributed to the accident and the engine and propeller were producing power at the time of impact.

The pilot was reported to have been known to conduct 'high-risk' aerial activities, including aerobatic flight in agricultural aircraft. A number of photographs taken shortly before the final flight showed him conducting low passes over the water-ski site with the aircraft's main wheels in contact with the surface of the water. During the accident flight he was reported to have conducted very low passes over a departing vehicle, more low passes over the water with the main wheels in contact with the water's surface and what was described to be manoeuvres consistent with aerobatic flight.

The investigation concluded that the pilot was probably conducting an aerobatic flight manoeuvre from which collision with terrain could not be prevented.

THE AUSTRALIAN TRANSPORT SAFETY BUREAU

The Australian Transport Safety Bureau (ATSB) is an operationally independent multi-modal Bureau within the Australian Government Department of Transport and Regional Services. ATSB investigations are independent of regulatory, operator or other external bodies.

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. Accordingly, the ATSB also conducts investigations and studies of the transport system to identify underlying factors and trends that have the potential to adversely affect safety.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and, where applicable, relevant international agreements. The object of a safety investigation is to determine the circumstances in order to prevent other similar events. The results of these determinations form the basis for safety action, including recommendations where necessary. As with equivalent overseas organisations, the ATSB has no power to implement its recommendations.

It is not the object of an investigation to determine blame or liability. However, it should be recognised that an investigation report must include factual material of sufficient weight to support the analysis and findings. That material will at times contain information reflecting on the performance of individuals and organisations, and how their actions may have contributed to the outcomes of the matter under investigation. 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.

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. While the Bureau issues recommendations to regulatory authorities, industry, or other agencies in order to address safety issues, its preference is for organisations to make safety enhancements during the course of an investigation. The Bureau prefers to report positive safety action in its final reports rather than making formal recommendations. Recommendations may be issued in conjunction with ATSB reports or independently. A safety issue may lead to a number of similar recommendations, each issued to a different agency.

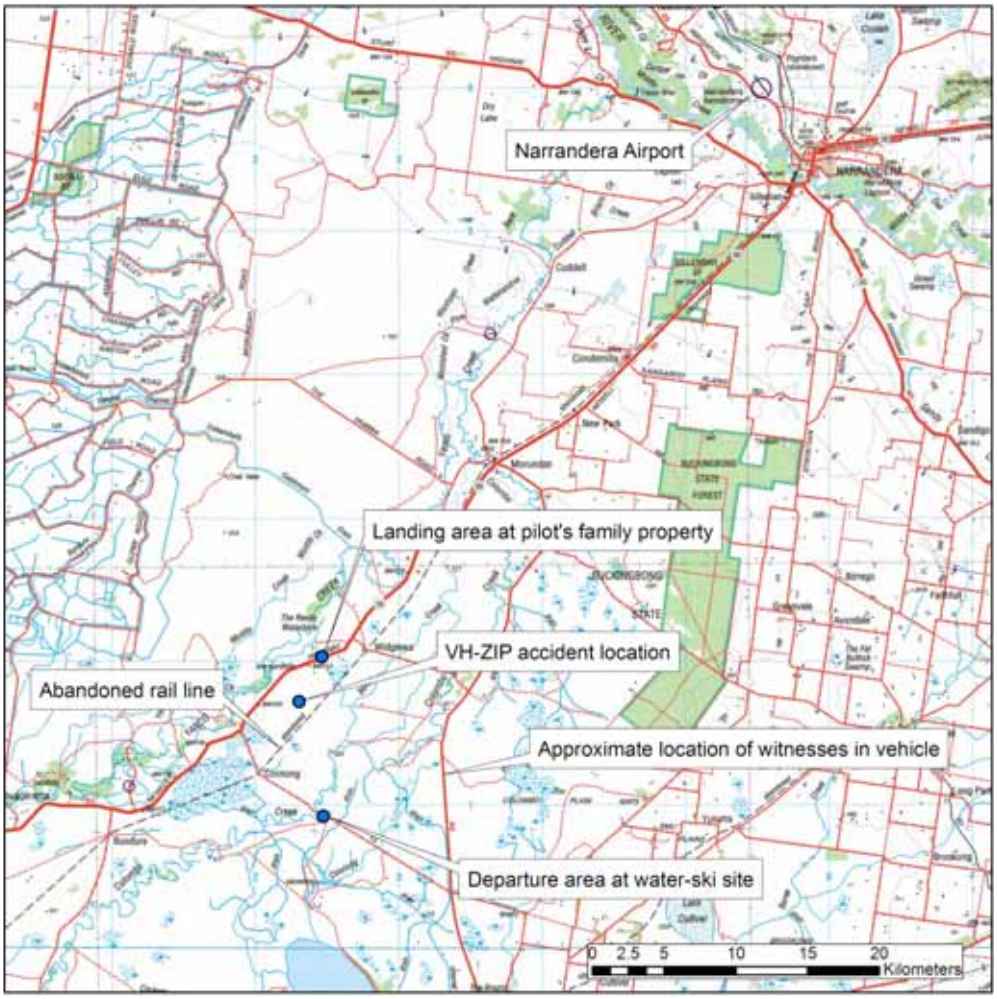
The ATSB does not have the resources to carry out a full cost-benefit analysis of each safety recommendation. The cost of a recommendation must be balanced against its benefits to safety, and transport safety involves the whole community. Such analysis is a matter for the body to which the recommendation is addressed (for example, the relevant regulatory authority in aviation, marine or rail in consultation with the industry).

FACTUAL INFORMATION

History of the flight

On 26 March 2006, at about 1800 Eastern Daylight-saving Time[1], a Cessna 188B Agwagon aircraft, registered VH-ZIP, was reported to have taken off from a field adjacent to a local water-ski area, about 59 km south-west of Narrandera, NSW, with the pilot as the sole occupant. The following morning at about 0900, the aircraft wreckage was found by a passer-by at a position 55 km south-west of Narrandera and about 8 km from the departure area (Figure 1). The aircraft was destroyed. There was no fire and the pilot was fatally injured.

Figure 1: Accident location



1 The 24-hour clock is used in this report to describe the local time of day, Eastern Daylight-saving Time, as particular events occurred. Eastern Daylight-saving Time was Coordinated Universal Time (UTC) + 11 hours.

The aircraft was based at the family property about 50 km south-west of Narrandera and about 4 km from the accident site (Figure 1). The Australian Transport Safety Bureau (ATSB) was unable to locate any witnesses to the accident itself, however a number of witnesses were able to assist in determining a probable sequence of events. The pilot's activities during the afternoon of the day of the accident appeared to focus on a local water-ski area, located about 11 km south of the pilot's family property (Figure 1). The probable sequence of the pilot's activities was determined as:

Approximate time	Pilot's activities
1200	- reported to have briefly eaten at the family property.
1430	- reported to have arrived in his vehicle at the water-ski area where he borrowed a hand-held Global Positioning System (GPS) unit to conduct a survey of a field at a nearby property.
1530	- returned to the water-ski site and arranged for someone to take photographs of him flying over the river when he returned with his aircraft. The photographs were to be taken using the pilot's camera.[2]
1630	- departed the water-ski site in his vehicle so that he could return in his aircraft.
1700	- landed in VH-ZIP at a field adjacent to the water-ski site, did not shutdown the engine and handed his camera to the person who was to take the photographs. The pilot then conducted four very low passes over the river while photographs were being taken. During those passes the aircraft's main wheels contacted the surface of the water (Figure 2). The pilot returned to land at the adjacent field and shutdown. He then spent some time socialising with persons at the water-ski site and retrieved his camera.
1800	- walked to his aircraft at the same time as persons, who were known to the pilot, were about to depart the area in their vehicle. He took-off to the west, turned back towards the east and conducted a very low pass over the departing vehicle. The occupants of the vehicle reported that they were startled by the overflight and had consequently stopped the vehicle. After overflying the vehicle, the pilot '…banked hard…', turned back to the west and overflew the vehicle again. During that second overflight, he was reported to have been flying directly toward the front of the vehicle at about '…double the fence height…'. He then conducted two more low passes over the river at the water-ski site prior to departing in the direction of his property. During both those

2 The pilot's camera was a small Advanced Photo System camera, loaded with a 25-exposure colour print film.

subsequent low passes over the river, the aircraft's main wheels were reported to have contacted the surface of the water.

1810-1815 The aircraft was observed manoeuvring in the vicinity of the water-ski site by the occupants of the vehicle which the pilot had previously overflown (Figure 1). It was described to be '…ducking and weaving…' over the water-ski area. It was subsequently observed to be heading towards the pilot's property in a level attitude, and shortly after to be in an attitude described as '…all up on one side…like an X in the sky…and coming around…' The last time the aircraft was observed it was described as having '…climbed …up into the air on its side and then banked around pretty hard and ducked down again…'

Pilot's camera

The pilot's camera was recovered from the aircraft wreckage in a severely damaged condition. However, the investigation was able to successfully recover the film. The film was torn and some light damage was evident, however a number of images were usable, including some depicting the pilot conducting a number of low passes along the river and contacting the surface of the water with the aircraft's main wheels (Figure 2). The person who took the photographs at the water-ski site reported that three exposures remained when he handed the camera back to the pilot prior to the final flight. There was evidence on the recovered film that at least two exposures had been taken inside the aircraft during the final flight. Due to the damage to the film, the exact nature of those photographs could not be determined.

Figure 2: VH-ZIP at water-ski area

Note: Left main wheel contacting water surface (inset)

Operational information

The pilot held a commercial pilot (aeroplane) licence, issued in May 2000 and an aerial agricultural grade 2 (aeroplane) rating issued in October 2000. In addition, he was issued an Aerial Agricultural Association of Australia, Operation Spray Safe, *Certificate of Approval*, in August 1999. There was no evidence that he had been trained or approved to conduct aerobatic[3] flight. Aerobatic flight was also prohibited in the aircraft type.

The investigation was unable to locate documentation to accurately determine the pilot's aeronautical experience, however in July 1999, the pilot recorded his total aeronautical experience to the aerial agriculture training provider as 510 hours. A further 35 hours were recorded during the aerial agriculture training. In April 2002, the pilot recorded his total flying hours with an aerial agricultural operator as 730 hours, of which a total of 67 hours were on aerial agricultural operations. The operator issued the pilot with a certificate of completion of a period under supervision. In 2004, the pilot was employed by another operator who estimated that his total aeronautical experience would have been about 1,500-1,700 flying hours, but the operator's flight and duty time records for the pilot were not able to be located.

The pilot's last Civil Aviation Safety Authority aviation medical examination conducted on 24 October 2005 revealed no abnormality which could have contributed to the accident. In addition, post-mortem medical examination and toxicology testing did not reveal evidence of any physiological condition which could have contributed to the accident.

On the day before the wreckage was found, the weather conditions in the area were reported to be fine with little or no wind. There were no overhead powerlines or other obstacles in the vicinity of the accident which could have contributed to the accident.

Wreckage examination

Examination of the aircraft wreckage indicated that it had impacted the ground heavily, in a nose-down, right wing-low attitude (Figure 3). All components of the aircraft were accounted for at the accident site and the aircraft was not fitted with an

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3 'Aerobatics' is defined by *The Cambridge Aerospace Dictionary, Bill Gunston, 2004*, as:

> Precise and largely standardised manoeuvres, unnecessary in normal flight, executed to acquire or demonstrate mastery over aircraft, for entertainment, or for competition…

Note: The Australian Civil Aviation Safety Authority uses the term 'acrobatic' in regard to pilot logbook entries.

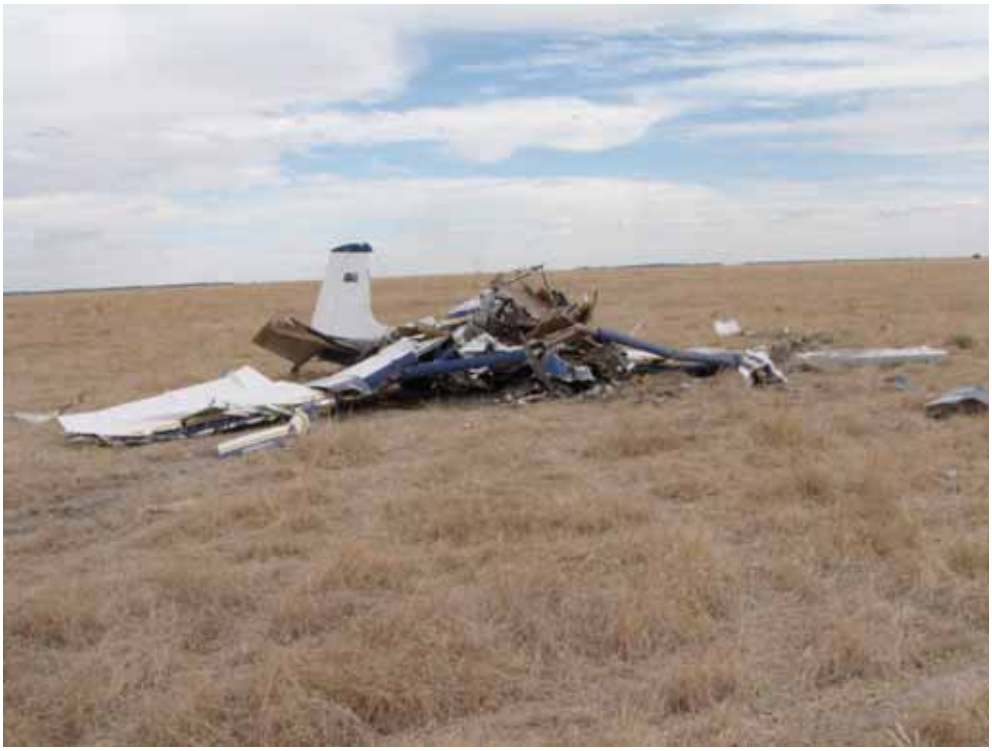
A 'manoeuvre' is also defined as:

> Any deliberate departure from straight-level flight…

emergency locator transmitter. There was no evidence of a flight control or systems problem which could have contributed to the accident.

Due to the rupture of the fuel tanks on impact, the amount of fuel on board could not be established. However, an examination of the engine and propeller indicated that they were producing power at the time of impact. Additionally, the pilot had remarked to a person at the water-ski site that he had enough fuel on board to return to the landing area at the family property.

Figure 3: Accident site



A witness reported that the pilot had remarked to him that the aircraft's airspeed indicator was blocked by a hornet's nest and was not operating. No pre-impact defects in the pitot and static systems were identified in the wreckage.

The oscillator of the stall warning buzzer was recovered to the ATSB laboratory for testing and found to be operating correctly. However, due to the damage to the aircraft and the disruption of the stall warning and electrical system wiring, the operational status of the stall warning system prior to impact could not be ascertained.

The aircraft was fitted with a GPS system that could only be used for agricultural operations and did not have the capability to record track data. The on-site examination of the system indicated that it was in the OFF position at impact.

Aircraft maintenance

A review of the aircraft maintenance documentation revealed that the current Maintenance Release contained no entries for hours or daily inspections since it had been issued on 9 June 2005, and an entry for an oil change had not been signed off at the appropriate time. Until the end of December 2005, the pilot had been operating under his previous employer's air operator's certificate and had provided them with a photocopy of the current Maintenance Release. That photocopy version contained entries of flight hours and daily inspections which had been signed by the pilot, and which did not appear on the original document.

A review of the airframe and engine maintenance logs showed no outstanding Service Bulletins, Airworthiness Directives or maintenance requirements. No other documentation anomalies were found.

The pilot's previous employers and other persons reported that he was known to conduct 'high-risk' aerial activities outside of what could be expected of an agricultural pilot and during periods when not conducting agricultural operations. Those aerial manoeuvres were reported to have included aerobatic flight in agricultural aircraft. The employers also advised the ATSB that the pilot's documentation procedures were poor.

ANALYSIS

There was no evidence of an aircraft or system problem which could have contributed to the accident. There was also no evidence of a physiological condition which could have contributed to the accident. The pilot was known to engage in 'high risk' aerial activities, and photographic evidence of such activity was taken shortly before the flight during which the accident occurred. He was reported to have previously conducted aerobatic flight in agricultural aircraft and witnesses reported a number of high risk activities during the final flight. The last reported sighting of the aircraft described the pilot conducting an aerial manoeuvre consistent with aerobatic flight.

As the pilot was the sole occupant, the reason for the aircraft impacting terrain could not be conclusively established. However, it is probable that the pilot was conducting an aerobatic flight manoeuvre from which collision with terrain could not be prevented.

This accident serves as a salient reminder of the consequences of taking unnecessary risks during aircraft operations.