



**Australian Government**

**Australian Transport Safety Bureau**

**ATSB TRANSPORT SAFETY INVESTIGATION REPORT**

Aviation Occurrence Investigation – AO-2007-047

Preliminary

**Collision with terrain  
255 km south-west of Warburton, WA  
17 October 2007**

**VH-WXC  
Cessna Aircraft Company C210**





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**Abstract**

The pilot of a Cessna Aircraft Company C210, registered VH-WXC, was fatally injured when the aircraft impacted terrain, approximately 255 km SW of Warburton, WA.

The pilot had dropped off an item of general freight at Warburton and was returning to Kalgoorlie when the accident occurred.

The aircraft was being operated at night under the visual flight rules.

The investigation is continuing.

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# THE AUSTRALIAN TRANSPORT SAFETY BUREAU

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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.

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.

## **Purpose of safety investigations**

The object of a safety investigation is to enhance safety. To reduce safety-related risk, ATSB investigations determine and communicate the safety factors related to the transport safety matter being investigated.

It is not the object of an investigation to determine blame or liability. However, 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.

## **Developing safety action**

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. The ATSB prefers to encourage the relevant organisation(s) to proactively initiate safety action rather than release formal recommendations. However, depending on the level of risk associated with a safety issue and the extent of corrective action undertaken by the relevant organisation, a recommendation may be issued either during or at the end of an investigation.

The ATSB has decided that when safety recommendations are issued, they will focus on clearly describing the safety issue of concern, rather than providing instructions or opinions on the method of corrective action. As with equivalent overseas organisations, the ATSB has no power to implement its recommendations. It is a matter for the body to which an ATSB recommendation is directed (for example the relevant regulator in consultation with industry) to assess the costs and benefits of any particular means of addressing a safety issue.

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## FACTUAL INFORMATION

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The information contained in the preliminary report is derived from initial investigation of the occurrence. Readers are cautioned that there is the possibility that new evidence may come to light that alters the circumstances as depicted in this report.

### History of the flight

Shortly before 1800 Western Standard Time<sup>1</sup> on 17 October 2007, a Cessna Aircraft Company C210, registered VH-WXC, departed Warburton Aerodrome, WA on a flight to Kalgoorlie, WA. The pilot was operating the aircraft under the visual flight rules (VFR) and the pilot was the sole aircraft occupant.

The aircraft had departed Kalgoorlie earlier that afternoon carrying an item of general freight for delivery to Warburton. That flight had been arranged at short notice and the pilot was called in to work to undertake the flight.

When the pilot failed to arrive at his home as expected that evening, the pilot's house mate contacted the aircraft operator. A check of the airport confirmed that the aircraft was overdue; AusSAR<sup>2</sup> was notified and a search commenced. A search aircraft subsequently located the aircraft wreckage, approximately 255 km (138 NM) along the direct track<sup>3</sup> from Warburton to Kalgoorlie. The pilot was fatally injured.

### Accident site and wreckage

The aircraft impacted sandy, desert-type terrain (Figure 1) at high speed and was destroyed by impact forces. The fuel tanks ruptured on impact and there was a post-impact fire. The accident was not survivable.

The impact trajectory of the aircraft was approximately 217 degrees magnetic and the rear fuselage came to rest approximately 50 m in the direction of travel beyond the initial impact point.

The aircraft engine and propeller were located a short distance from the initial impact point and one of the propeller blades had failed in overload during the impact sequence. A preliminary assessment of the damage to the propeller blades and of the damage to the propeller hub mounting flange was consistent with the propeller being under engine power at the time of the collision with terrain.

The aircraft's fuel caps were found secured and there was no evidence of an in-flight leakage of fuel. The wing flaps were up and the landing gear was retracted.

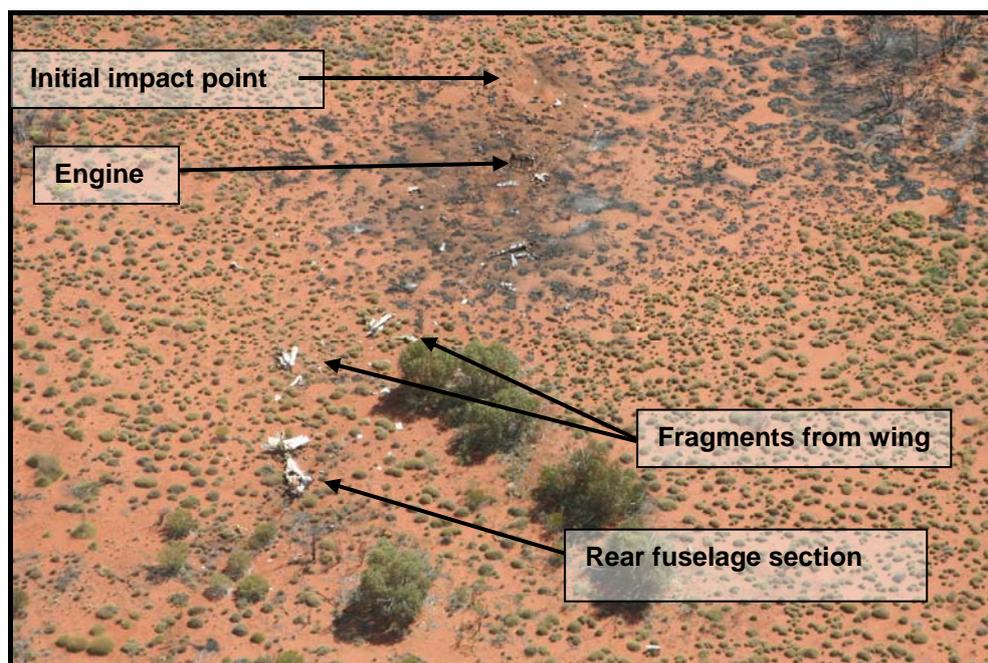
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1 The 24-hour clock is used in this report to describe the local time of day, Western Standard Time (WST), as particular events occurred. Western Standard Time was Coordinated Universal Time (UTC) + 8 hours.

2 AusSAR is the Australian agency responsible for coordinating search and rescue activities.

3 That track was 222 degrees magnetic.

**Figure 1: Photograph overhead accident site**



Fragments of coloured lens from all of the aircraft's navigation lights<sup>4</sup> and of the anti-collision beacon were found in the vicinity of the initial impact point. Those fragments indicated that the aircraft was in an inverted attitude when it collided with terrain. The orientation of ground marks made by the leading edge of the wing and the vertical stabiliser was consistent with the aircraft being in a banked attitude at impact.

The aircraft was assessed as being intact prior to the collision with terrain.

## Weather

Last light<sup>5</sup> at Warburton was 1805 on the evening of the accident and 1814 in the vicinity of the accident site.

A preliminary report from the Bureau of Meteorology (BoM) indicated that a cold front and middle-level trough were moving through the south-western parts of WA during the afternoon and were approaching the western Goldfields. Ahead of the front, a well-developed surface trough extended from the southern Pilbara to the Eucla regions. The track from Warburton to Kalgoorlie would have intersected that surface trough. The report indicated that it was likely that thunderstorms would be associated with the surface trough and that their development would be aided by weak instability in the mid-levels of the atmosphere.

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4 Wingtip (red on the left and blue-green on the right) and tail (white) lights that enhance an aircraft's visibility at night.

5 Last light is consistent with the end of evening civil twilight, when the centre of the sun is at an angle of 6 degrees below an ideal horizon.

The relevant BoM area forecast, valid from 1300 to midnight, predicted isolated<sup>6</sup> thunderstorms and showers, with visibility reducing to 8,000 m in any showers and 5,000 m in thunderstorms. Cumulonimbus cloud between 10,000 and 35,000 ft was forecast associated with the thunderstorms and scattered<sup>7</sup> altocumulus and altostratus was forecast above 12,000 ft. Moderate turbulence was predicted until 1700 due to thermal activity. The area winds during the first part of the flight were forecast to be north to north-westerly, between 18 and 56 km/h.

## Pilot

The pilot held an Australian Commercial Pilot (Aeroplane) Licence<sup>8</sup>, a Command Multi-Engine Instrument Rating and an Instructor Rating. The pilot had completed renewals of his Command Multi-Engine Instrument Rating and Flight Instructor Rating during May 2007.

The pilot held Class 1 Civil Aviation Medical Certificate with nil restrictions.

Although the pilot had been called in at short notice for the flight, he was reported to have been well rested prior to the flight and in normal spirits prior to departing Kalgoorlie.

## Aircraft

The aircraft was maintained in accordance with the aircraft manufacturer's system of maintenance. That system was based on a 200-hour maintenance cycle, with maintenance conducted progressively during that period at specified intervals.

A maintenance release for the aircraft was issued on 10 September 2007. Records maintained by the operator indicated that the aircraft had flown approximately 37 hours since that time.

## Fuel

The aircraft was reported to have been refuelled to 'tabs'<sup>9</sup> at Warburton. Consequently, the fuel tanks contained approximately 249 L of useable fuel on

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<sup>6</sup> 'Isolated' describes the existence of individual thunderstorms within the region.

<sup>7</sup> Scattered meaning 3 to 4 oktas. An okta is the unit of measurement that is used to report the total sky area that is visible to the celestial horizon. One okta is equal to 1/8<sup>th</sup> of that visible sky area. The term okta is also used to forecast or report the amount of cloud in an area, along a route or at an airfield. The numbers of oktas of cloud are reported or forecast as follows: Few (FEW), meaning 1 to 2 oktas; Scattered (SCT), meaning 3 to 4 oktas; Broken (BKN), meaning 5 to 7 oktas, and Overcast (OVC), meaning 8 oktas.

<sup>8</sup> That licence was issued 26 May 2006, on the basis of the pilot holding a Commercial Pilot Licence issued by the Civil Aviation Authority of New Zealand.

<sup>9</sup> 'Tabs' was an intermediate filling point for the aircraft's fuel tanks. Metallic tabs inside the tanks' filler necks provided a visual indication of a reduced fuel capacity when refuelling the aircraft.

departure. At normal cruise power settings, that would have provided an aircraft endurance<sup>10</sup> of about 4 hours.

## **Further investigation**

The investigation is continuing and will include:

- an examination of recovered components, including components from some of the aircraft's flight instruments
- the analysis of the damage to the propeller blades and the failure mode of the propeller mounting flange
- the analysis of the meteorological conditions along the intended route during the night of the accident
- a review of the operational factors associated with the conduct of the flight
- a review of the aircraft's documentation and maintenance records.

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<sup>10</sup> Maximum time that an aircraft can continue flying under given conditions without refuelling.