Australian Government
Australian Transport Safety Bureau

Collision with terrain involving Cessna 206, VH-WAV

156 km SSE of Croydon, Qld | 15 September 2013

Investigation

ATSB Transport Safety Report
Aviation Occurrence Investigation
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Addendum

Page	Change	Date

Safety summary

What happened

At about 1200 on 15 September 2013, the pilot-owner of a Cessna 206, registered VH-WAV, landed on a public road to repair a truck at a work camp. At about 1516, during take-off from a different, curved road, the aircraft's left wing struck a tree at a height of about 30 ft. The wingtip and aileron separated before the aircraft impacted terrain, fatally injuring the pilot and passenger. The aircraft was destroyed.

Accident site

Source: ATSB

What the ATSB found

The distance available from where the pilot increased power for take-off was much shorter than the distance advised in the aircraft's pilot operating handbook under the prevailing conditions.

There was no apparent reason for the pilot to attempt a take-off from that location when a more suitable location was nearby. It is most likely that the pilot misjudged the distance available, the prevailing conditions and their effect on the aircraft's performance, or had a false recollection of the relative layout of the two roads and thought that there was more take-off room available beyond the curve. However, it is also possible that the pilot's judgement of the available distance, or his decision-making capability, was affected by a serious medical condition and/or prescribed medications that had not been reported to the Civil Aviation Safety Authority (CASA) until after the pilot's previous medical certificate had expired.

In addition, the ATSB found that the pilot's seat had broken from its mounts, probably as the result of heavy, unsecured cargo striking it during the accident sequence. This could have had a detrimental effect on the survivability of the accident.

Safety message

The accident highlights the importance of carefully considering all relevant factors that could affect the suitability of a particular landing and take-off area. These include: aircraft weight and engine power; wind direction, speed and gusts; ambient air pressure and temperature; surface slope, material, and condition; other physical characteristics of the area such as its length and width; and the height and location of surrounding obstacles.

Though no link with the accident was established, flying without a valid medical certificate, or omitting to report a diagnosed condition or treatment to a Designated Aviation Medical Examiner or to CASA, can lead to such an impairment being undetected or its effect underestimated.

Unrestrained cargo poses a significant risk to the survivability of aircraft occupants. Pilots should take care to ensure that all cargo is adequately restrained to prevent movement during flight and improve survivability in the event of an accident.

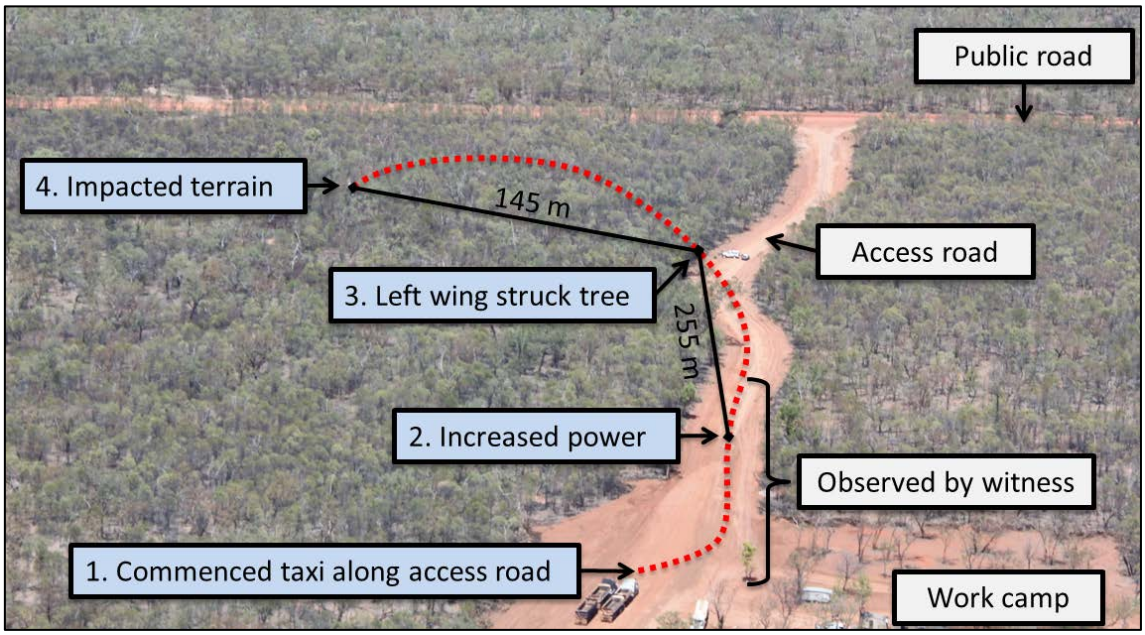
Contents

The occurrence

At about 1130 Eastern Standard Time[1] on 15 September 2013, the pilot-owner of a Cessna 206 aircraft, registered VH-WAV, took off from Croydon, Queensland on a flight to a council work camp on private property about 156 km south-south-east of Croydon. Also on board the aircraft were a passenger and some mechanical parts and tools, and the purpose of the flight was for the two occupants to conduct repairs to a truck at the work camp. The nearest purpose-built landing area was an unlicensed airstrip on the property about 13 km away.

The pilot landed on a straight, unsealed public road about 650 m from the work camp at about 1200 and taxied to the camp using an unsealed private access road (Figure 1). The pilot parked on the access road and both occupants disembarked.

Figure 1: Accident site overview



Source: ATSB

After completing repairs to the truck, the pilot and passenger re-boarded the aircraft. A witness reported that the pilot started the engine and apparently completed some pre-flight checks for about 2–3 minutes before taxiing about 90 m back along the access road towards the public road. The witness reported that while still moving, the aircraft's engine revved up as though for take-off and the aircraft accelerated along the access road. Prior to the aircraft reaching a curve in the road, the witness lost sight of the aircraft due to sand and dust in the air. Shortly afterwards several witnesses heard the sound of a heavy impact.

Later examination showed that the aircraft's left wing struck a tree at a height of about 30 ft. The wingtip and aileron separated before the aircraft impacted terrain, fatally injuring the pilot and passenger. The aircraft was destroyed (Figure 2). The accident occurred at about 1516.

[1] Eastern Standard Time (EST) was Coordinated Universal Time (UTC) + 10 hours.

Figure 2: Aircraft wreckage

Source: ATSB

Context

Pilot information

General

The pilot held a Private Pilot (Aeroplane) Licence (PPL(A)) that was issued in 2003 and had owned and flown VH-WAV (WAV) since 2006. A review of the pilot's logbook indicated that he flew regularly, accruing a total of 2,121.5 hours, including the flight from Croydon. In the previous 90 days the pilot accrued about 50 hours, all of it in WAV. The pilot's most recent flight was conducted on 8 September 2013.

Medical information

A valid Class 2 or higher Medical Certificate is required to exercise the privileges of the PPL(A). A Class 2 Medical Certificate for the pilot, which was issued in February 2011 and expired on 20 February 2013, was found at the accident site.

Civil Aviation Safety Authority (CASA) records showed that the pilot underwent an examination for a Class 2 Medical Certificate on 23 May 2013. The Designated Aviation Medical Examiner (DAME) stated on the examination report that the pilot was '…not restricted in any of his activities, including…flying his aircraft.' However, since more than 3 months had passed since the expiry of the previous certificate, the DAME was unable to revalidate it, and the pilot was not permitted to exercise the privileges of the PPL(A) until a new certificate was issued by CASA.[2]

The examination report included advice of the pilot having been diagnosed with multiple myeloma in July 2011 and undergoing subsequent spinal surgery. This treatment was followed by radiation therapy and chemotherapy for about a year, followed by ongoing palliative care incorporating the use of a pain relief opioid and other medication. There was no record of the condition or treatments being reported to CASA prior to its receipt of the pilot's application for the medical certificate on 31 May 2013.[3]

On 19 June 2013, as part of the assessment process for issuing a medical certificate, CASA requested further information in relation to the multiple myeloma and ongoing treatment. A letter of 14 August 2013 from the pilot's palliative care specialist stated that the specialist did 'not see any reason from a pain and symptom management point of view, that [the pilot] cannot continue to engage in… flying activities and piloting of aircraft...' as long as the medication dose remained stable.

The medical certificate application was escalated by CASA to a complex case management (CCM) process on 27 August 2013. This process is initiated when a case has particular diagnoses, has multiple conditions or is in any other way considered complex. As part of the CCM process, relevant medical matters are circulated across a team of doctors to make a collegiate determination of the associated risks and required surveillance.

As a result of the CCM process, CASA issued the pilot with a notice that was recorded to have been received on 11 September 2013 and advised that the application for a Class 2 Medical Certificate was to be refused. The pilot was allowed 30 days to provide further information on why the application should not be refused.

The pilot was still undergoing palliative care and the administration of associated medications at the time of the accident. Listed side effects of the prescribed medications included drowsiness, dizziness, ataxia (loss of muscle coordination) and fatigue. Each medication is noted to affect

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[2] Under the Civil Aviation Safety Regulations (1998), a DAME can revalidate a pilot's Medical Certificate if the application to do so is made within 3 months of expiry of the certificate.

[3] Civil Aviation Safety Regulation 67.265 defines the obligation on licence holders to tell CASA of changes in their medical condition.

10 to 20 per cent of patients. It was reported that, in the weeks prior to the accident, the pilot had ceased using the opioid and was taking lower quantities of some other medications than were prescribed.

In July 2013, the pilot was diagnosed with a viral infection that resulted in headaches and affected vision in the right eye as the result of glare. It was reported that those symptoms were easing by the time of the accident. There was no record of this condition being reported to CASA.

According to witnesses, the pilot was in a good mood on the day of the accident and seemed in good health. The pilot was reported to have slept well the previous night and had eaten a light breakfast.

Post-mortem examinations

A post-mortem examination identified that the pilot died as the result of impact injuries, with no significant natural disease identified.

Toxicology tests detected the presence of all of the previously reported medications in the pilot's blood. The measured concentration of Gabapentin (a neuropathic pain reliever medication) was high, while the concentrations of the other medications were within the normal therapeutic ranges. Symptoms of high levels of Gabapentin can include drowsiness, dizziness, vision impairment and slurred speech. Witnesses who interacted with the pilot in the period before the flight reported that the pilot did not exhibit any unusual behaviour.

Toxicology tests also detected alcohol in both the femoral blood (at an equivalent concentration of 0.029 per cent blood alcohol content) and urine. Witnesses did not report observing the pilot drinking any alcohol on the day of the accident and studies have highlighted the possibility for post-mortem production of alcohol.[4]

The post-mortem examination report stated that the concentration of Gabapentin, in combination with alcohol, may have made the pilot 'somewhat drowsy'.

Aircraft information

Overview

The aircraft, Cessna Aircraft Company U206G serial number U20604058, was a single-engine, high-wing general utility aircraft seating up to six occupants depending on configuration. It was manufactured in the United States in 1977 and first registered in Australia that year.

Maintenance

The aircraft maintenance release was issued on 20 December 2012 at 6,904.6 airframe hours and was valid for 12 months or 100 flight hours. The most recent record of flight hours was dated 7 September 2013 and showed 7,006.3 airframe hours, or 101.7 hours since the last inspection. It was reported that the pilot carried out some minor maintenance, such as oil changes, between inspections.

Examination of the maintenance records showed that the aircraft accumulated more than the allowed 100 flight hours between periodic inspections on six occasions between 2009 and 2012, with 164.0 hours between inspections on one occasion.

Engine and propeller

The aircraft was fitted with a Teledyne Continental IO-550-N engine and Hartzell PHC-J3YF-1RF/F8068 propeller, installed under a Supplemental Type Certificate. The IO-550 engine was rated at 310–325.5 hp take-off power. Prior to its installation the aircraft was fitted with an IO-520 engine, rated at 292.5–307.5 hp take-off power. At the time of the accident the engine and propeller had accumulated 101.7 flight hours since fitment.

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[4] Robertson, S 2005, *Interpretation of Measured Alcohol Levels.* Available at www.atsb.gov.au.

Engine throttle (power), propeller pitch, and fuel mixture were each controlled by push-pull sliding shafts mounted on the lower edge of the instrument panel (Figure 3). At take-off, the three control knobs are normally pushed fully forward (that is, corresponding to the full throttle, fine pitch, and full rich[5] positions respectively).

Figure 3: Engine controls (exemplar aircraft)

Source: Wikipedia. Image modified by ATSB

Fuel

According to a flight log that was found in the wreckage, the aircraft was last refuelled on 8 September 2013 and had a total of 255 L of fuel on board when it landed at Croydon later on the same day. There was no record of any other flight in the aircraft prior to the pilot's flight to the council work camp on 15 September. Using estimates of flight time and fuel consumption since the pilot departed Croydon, the ATSB calculated that the aircraft probably had about 220 L of fuel remaining at take-off from the access road.

The characteristics of a sample of fuel taken on-site from the aircraft's right wing tank were consistent with 100LL aviation gasoline. The sample was clear and uncontaminated. The left wing tank was breached during the accident.

Weight and balance

The aircraft's maximum take-off weight (MTOW) was 1,633 kg. Using estimates of the fuel quantity, cargo weight, and occupant weights, the ATSB calculated that the aircraft's weight at the time of the accident was about 1,233 kg.

The ATSB estimated that around 90 kg of cargo was carried in the cabin in an open area behind the front seats, including numerous tools, a 20 L tin of oil and a truck part weighing 21 kg. There

[5] The pilot operating handbook advised that mixture settings be 'leaned' (reduced from full rich) to account for field elevation. This provides a small amount of additional engine power at higher elevations. At the local elevation of about 1,000 ft, the optimal mixture was probably close to full rich.

were no cargo restraints, net, or barrier found in the wreckage. As a result, it was not possible to determine where in the cabin the cargo was carried, or whether some of the load shifted during take-off and/or the impact sequence. The ATSB estimated the aircraft's centre of gravity using the forward and rearward extremes of the possible cargo locations and, in both cases, it was within the allowable limits.

Take-off performance

The pilot operating handbook for WAV was not available to the ATSB. However, other handbooks issued for the same model of aircraft included a table of expected take-off distances for aircraft to reach 50 ft above airfield height for different combinations of aircraft weight, air density and temperature, and wind. The distances provided were applicable to a standard Cessna 206 using a 'short field takeoff' technique (that is, with 20° of flap selected, the pilot holding wheel brakes until the propeller reaches full RPM, and with a reduced climb speed) on a paved, level and dry runway. Given these parameters, the take-off distance for an aircraft weight of 3,000 lb (1,361 kg), 30 °C ambient temperature and no wind was 1,280 ft (390 m) to reach a height of 50 ft.

The handbook stated that for operation with tailwinds up to 10 kt, the distances increased by 10 per cent for each 2.5 kts. For an estimated 5 kt tailwind on the day, the correction resulted in an expected take-off distance of 468 m.

There was no information available to the ATSB to quantify the effect of the more powerful IO-550 engine over the standard IO-520 engine on the aircraft's take-off performance. However, it would be expected that, given similar conditions and pilot technique, the use of any additional power available would reduce take-off distance.

Accident site information

Take-off area

The area around the roads and camp was covered in trees that were generally about 25-30 ft high (Figure 4). The public road was about 20 m wide, with a hard clay surface. The access road to the work camp was about 13 m wide, comprising an 8 m wide strip of hard clay with light loose sand along the centre with soft sand at the edges, and had minimal slope.

Figure 4: View from the approximate location where engine power was increased

Source: ATSB

About 155 m from the reported commencement of the take-off, the access road curved about 20° to the left (Figure 1 and Figure 4). About 75 m beyond that point the road curved 25° to the right, then left 15° to intercept the public road.

Wreckage information

All of the aircraft's major components were located at the accident site and there was no evidence of pre-impact damage or defects. About 0.75 m of the aircraft's left wingtip and part of the left aileron separated from the aircraft immediately after contacting the tree. The left wingtip leading edge exhibited a compaction mark of a similar size to a large branch that had broken off the tree.

Ground marks and damage to the aircraft indicated that it impacted terrain in a very steep, left-wing low and nose-down attitude. The aircraft came to rest about 10 m from the initial ground impact point.

The propeller exhibited bending consistent with it being driven under significant power at the time of impact. Engine, propeller and flight control continuity was established. It was not possible to determine the flap position at the time of impact.

Survivability

For an accident to be survivable, four basic requirements need to be met:

- the forces imparted on the aircraft occupants must be within human tolerance
- the occupants must be restrained to prevent flail injuries
- the liveable space inside the aircraft must be maintained
- the occupants must have a means of escape.

The dynamics of every aircraft accident are different and result in different levels of injury to the occupants. However, it is useful to evaluate which of the basic requirements were not met so that survivability in future accidents can be improved.

The ATSB estimated the deceleration forces imparted on the occupants using a range of probable speeds and angles of impact. That analysis indicated that the forces were around the limits of human tolerance. Both front-seat lap-sash restraints were appropriately secured and did not detach from their anchor points on the cabin ceiling and floor during the impact sequence.

The liveable space around the passenger's seat on the right side of the fuselage was significantly compromised. The liveable space on the left (pilot's) side of the fuselage was only partly compromised. However, the pilot's seat had broken from its mounts and the unsecured truck part (see the earlier section titled *Weight and balance*) was found next to one of the seat mounts. The ATSB determined that the seat mounts may have broken as the result of impact from the truck part during the accident sequence. If so, it might have increased the forces imparted on the pilot and/or reduced the effectiveness of the pilot's restraint system.

Meteorological information

The nearest aerodrome meteorological report (METAR)[6] was for Richmond, Queensland, about 146 km south-south-east of the accident site. The 1530 Richmond METAR reported a northerly wind at 10 kt, and a temperature of 38 °C. Bureau of Meteorology observations at Richmond indicated an easterly wind at 5 kt and a temperature of 37 °C at 1500.

The area forecast[7] indicated 20 kt northerly winds at 2,000 ft.

A witness reported local conditions as fine and clear, with a light northerly gusting wind. There were no reported dust devils or other significant phenomena around the time of the accident.

Aeroplane landing areas

An aeroplane landing area (ALA) is a place that is not formally authorised as an 'aerodrome' but where aircraft with a MTOW up to 5,700 kg are permitted to land and take off when conducting private, aerial work, or charter operations. Under Civil Aviation Regulation (CAR) 92 (1) *Use of aerodromes*, such aircraft may land at an ALA if the place:

> …is suitable for use as an aerodrome for the purposes of the landing and taking-off of aircraft; and, having regard to all the circumstances of the proposed landing or take-off (including the prevailing weather conditions), the aircraft can land at, or take-off from, the place in safety.

Civil Aviation Advisory Publication (CAAP) 92-1(1) *Guidelines for Aeroplane Landing Areas* set out factors that may be used to determine the suitability of a place for the landing and taking-off of aeroplanes. It stated that:

> …a runway length equal to or greater than that specified in the aeroplane's flight manual or approved performance charts or certificate of airworthiness, for the prevailing conditions is required.

Among other requirements, it also advised that runways should comply with the physical characteristics shown in Figure 5.

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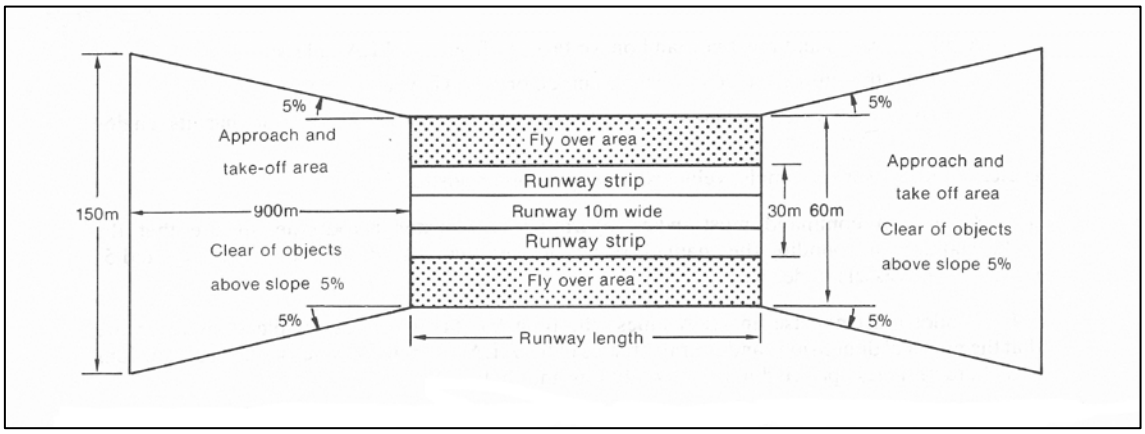
6 Routine aerodrome weather report issued at fixed times, hourly or half-hourly.

7 An area forecast is issued for the purposes of providing aviation weather forecasts to pilots. Australia is subdivided into a number of forecast areas. The accident site was situated in Area 43.

Figure 5: Landing area physical characteristic requirements in CAAP 91-1(1)[8]



Source: CASA

[8] The physical characteristic requirements shown only apply to for single-engined, centre-line thrust aeroplanes not exceeding 2000 kg maximum take-off weight.

Safety analysis

Attempted take-off

The witness report and site evidence is consistent with an attempted take-off from the access road. There was no evidence of pre-existing aircraft defects and the propeller damage was consistent with significant engine power being applied to it at impact. In addition, the fact that the aircraft became airborne in a distance much shorter than advised in the manufacturer's operating handbook indicates that the engine was producing sufficient power for a normal take-off.

The available evidence indicates that the pilot almost certainly made a conscious decision to attempt a take-off from the access road. The position and necessary movement of the aircraft's throttle for take-off makes it unlikely that the throttle was moved by an incapacitated pilot or passenger slumping over it. In addition, any accidental or uncommanded increase in throttle could be countered by a number of means including shutting off the engine and applying wheel brakes.

The take-off was conducted on a relatively short and narrow section of road, which curved about 155 m from the reported commencement of the take-off, and was surrounded by trees. The distance available for take-off was much shorter than the distance advised by the aircraft's pilot operating handbook under the prevailing conditions. Suggested take-off and landing area considerations, as set out in Civil Aviation Advisory Publication (CAAP) 92-1(1) *Guidelines for Aeroplane Landing Areas* were also not met, including the runway width and the dimensions of the 'approach and take-off area'. In combination, these factors increased the risk associated with the take-off.

There was no apparent reason for the pilot to attempt a take-off from that location when the road on which the pilot had previously successfully landed was nearby. It is most likely that the pilot misjudged the distance available on the access road, the potential effect of the prevailing conditions on the take-off, the aircraft's performance, or a combination of these factors. Alternately, the pilot may have had a false recollection of the relative layout of the two roads and thought that there was more take-off room available beyond the curve in the access road. It is also possible that he considered traffic on the public road to be a greater hazard for take-off than for landing.

It is the pilot in command's responsibility to ensure that their choice of landing and take-off area is safe for the aircraft, operation, and conditions of the day. Landing and taking off from anywhere other than a dedicated aerodrome carries numerous risks, which need to be thoroughly assessed by the pilot. In particular, using a road for a landing area might entail unnecessary risk, particularly if there is an airfield available a short drive away. Among numerous other potential hazards, the surface and layout of the road and the surrounding terrain and obstacles should be carefully considered along with the more usual considerations that apply when using a dedicated aerodrome.

Pilot medical history

Based on the available information, it was not possible to determine whether the pilot's judgement of the available distance, or his decision-making capability, was affected by medical conditions and/or prescribed medications. However, the pilot's medical condition and medications did have the potential to affect the safety of flight in general, and were only reported to the Civil Aviation Safety Authority (CASA) after the pilot's medical certificate needed renewal. In addition, the evidence indicates that the pilot continued to fly without a current and valid medical certificate.

Assessing a pilot's medical condition is a very important step in ensuring the safety of flight. It is not limited to assessing the potential for incapacitation but incorporates many other aspects of a pilot's ability to fly, some of which are crucial to the safety of flight. Although a general practitioner or specialist may give sound advice about the potential adverse effects of a medical condition,

only a doctor with CASA approval, such as a Designated Aviation Medical Examiner (DAME), is appropriately authorised and qualified to make a reliable determination of the affected pilot's ability to safely operate an aircraft. Flying without a valid medical certificate, or omitting to report a diagnosed condition or treatment to a DAME or to CASA, can lead to such an impairment being undetected or its effect on the safety of flight being underestimated.

Survivability

The pilot's seat broke from its mounts during the impact sequence, possibly as a result of being struck by the unsecured cargo. This may have increased the forces imparted on the pilot and/or reduced the effectiveness of the pilot's restraint system. Though it was not possible to determine whether the pilot would have otherwise survived, the unrestrained cargo carried behind the front seats posed a significant risk to the survivability of the occupants.

Aircraft maintenance

Although aircraft maintenance was not identified as a contributing factor, the aircraft maintenance release was invalid at the time of the accident because the maximum flight period between inspections was exceeded. As a result, the continued safe operation of the aircraft's systems and structure could not be assured.

Findings

From the evidence available, the following findings are made with respect to the tree strike and collision with terrain involving Cessna Aircraft Company U206G (206), registered VH-WAV, which occurred 156 km south-south-east of Croydon, Queensland, on 15 September 2013. These findings should not be read as apportioning blame or liability to any particular organisation or individual.

Contributing factors

- The take-off was attempted from a road that did not meet the requirements for a suitable landing and take-off area.

Other factors that increased risk

- The pilot did not report significant medical conditions or associated treatment and flew on a number of occasions without a valid medical certificate.
- The aircraft's maximum flight period between inspections was exceeded on six occasions from 2009–2013, including at the time of the accident.
- The unrestrained cargo carried behind the seats posed a significant risk to the survivability of the occupants.

Other findings

- From the available evidence, the ATSB was unable to determine whether any medical factors contributed to the accident.

General details

Occurrence details

Date and time:	15 September 2013	
Occurrence category:	Accident	
Primary occurrence type:	Collision with terrain	
Location:	156 km south-south-east of Croydon, Queensland	
	Latitude: 19° 24.518'S	Longitude: 143° 02.610'E

Aircraft details

Manufacturer and model:	Cessna Aircraft Company U206G	
Registration:	VH-WAV	
Serial number:	U20604058	
Type of operation:	Private	
Persons on board:	Crew – 1	Passengers – 1
Injuries:	Crew – 1 (fatal)	Passengers – 1 (fatal)
Damage:	Destroyed	

Sources and submissions

Sources of information

The sources of information during the investigation included the:

- Bureau of Meteorology
- Civil Aviation Safety Authority (CASA)
- Queensland Police Service
- Office of the Northern Coroner – Queensland
- pilot's medical records and logbook
- aircraft maintainer
- aircraft maintenance records
- pilot's family.

Submissions

Under Part 4, Division 2 (Investigation Reports), Section 26 of the *Transport Safety Investigation Act 2003* (the Act), the Australian Transport Safety Bureau (ATSB) may provide a draft report, on a confidential basis, to any person whom the ATSB considers appropriate. Section 26 (1) (a) of the Act allows a person receiving a draft report to make submissions to the ATSB about the draft report.

A draft of this report was provided to CASA and the pilot's family.

Submissions were received from the pilot's family. The submissions were reviewed and where considered appropriate, the text of the report was amended accordingly.

Australian Transport Safety Bureau

The Australian Transport Safety Bureau (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; 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 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 identify and reduce safety-related risk. ATSB investigations determine and communicate the 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.

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 initiate proactive safety action that addresses safety issues. Nevertheless, the ATSB may use its power to make a formal safety recommendation either during or at the end of an investigation, depending on the level of risk associated with a safety issue and the extent of corrective action undertaken by the relevant organisation.

When safety recommendations are issued, they focus on clearly describing the safety issue of concern, rather than providing instructions or opinions on a preferred method of corrective action. As with equivalent overseas organisations, the ATSB has no power to enforce the implementation of its recommendations. It is a matter for the body to which an ATSB recommendation is directed to assess the costs and benefits of any particular means of addressing a safety issue.

When the ATSB issues a safety recommendation to a person, organisation or agency, they must provide a written response within 90 days. That response must indicate whether they accept the recommendation, any reasons for not accepting part or all of the recommendation, and details of any proposed safety action to give effect to the recommendation.

The ATSB can also issue safety advisory notices suggesting that an organisation or an industry sector consider a safety issue and take action where it believes it appropriate. There is no requirement for a formal response to an advisory notice, although the ATSB will publish any response it receives.

Australian Transport Safety Bureau

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Investigation

ATSB Transport Safety Report
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