Australian Government
Australian Transport Safety Bureau

ATSB TRANSPORT SAFETY REPORT
Aviation Occurrence Investigation AO-2007-058
Final

Wirestrike
20 km north of Elliott, NT
10 November 2007
VH-WLQ
Cessna Aircraft Company 172N

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Wirestrike – 20 km north of Elliott, NT - 10 November 2007 - VH-WLQ - Cessna Aircraft Co. 172N.

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Abstract

On 10 November 2007 at approximately 0830 Central Standard Time, a Cessna Aircraft Company 172N, registered VH-WLQ, with two pilots and a passenger on board departed Katherine, NT on a private, visual flight rules (VFR) flight to Tennant Creek. At about 1030, the aircraft struck a powerline which spanned the Stuart Highway 20 km north of Elliott. The aircraft's tail section was broken rearwards from the aft fuselage, rendering the aircraft uncontrollable and causing it to impact the highway in a steep nose-down attitude. The three occupants were fatally injured. The aircraft was destroyed.

There was no evidence of an aircraft or operational reason for the flight below 500 ft above ground level (AGL). Based on a lack of evidence to the contrary, the investigation concluded that the descent to, and flight at low level was probably as a result of a conscious decision by the pilots.

The investigation was unable to establish which of the pilots was flying the aircraft at the time of the accident.

THE AUSTRALIAN TRANSPORT SAFETY BUREAU

The Australian Transport Safety Bureau (ATSB) is an operationally independent multi-modal bureau within the Australian Government Department of Infrastructure, Transport, Regional Development and Local Government. 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.

About ATSB investigation reports: How investigation reports are organised and definitions of terms used in ATSB reports, such as safety factor, contributing safety factor and safety issue, are provided on the ATSB web site www.atsb.gov.au.

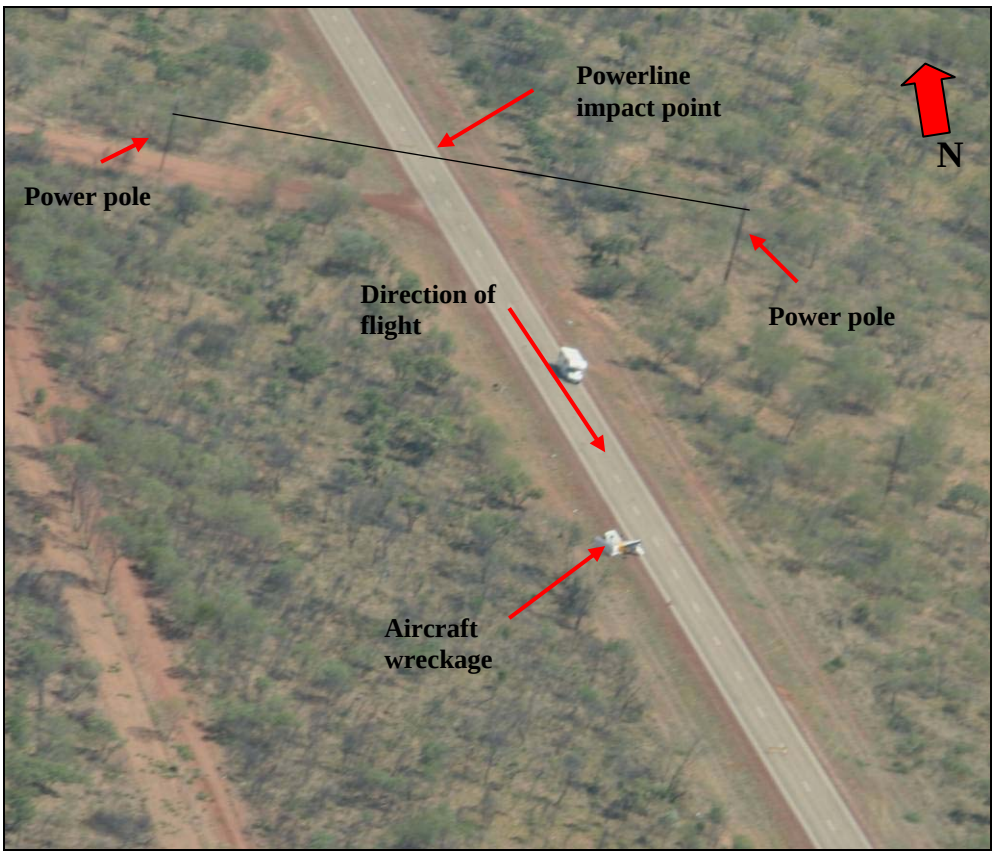
FACTUAL INFORMATION

History of the flight

On 10 November 2007 at approximately 0830 Central Standard Time[1], a Cessna Aircraft Company 172N, registered VH-WLQ, with two pilots and a passenger on board departed Katherine, NT on a private, visual flight rules (VFR) flight to Tennant Creek. At about 1030, the aircraft struck a powerline that spanned the Stuart Highway 20 km north of Elliott and was 15 m above the surface of the road.

The aircraft's tail section contacted the powerline, breaking the tail rearwards from the aft fuselage and rendering the aircraft uncontrollable. The aircraft impacted the highway in a steep nose-down attitude and came to rest inverted on the verge beside the highway, approximately 150 m south of the powerline (Figure 1). The three occupants were fatally injured. The aircraft was destroyed.

Figure 1: Accident site



1 The 24-hour clock is used in this report to describe the local time of day, Central Standard Time (CST), as particular events occurred. Central Standard Time was Coordinated Universal Time + 9.5 hours.

Background information

The aircraft occupants were part of a group of German nationals that hired four Cessna 172 aircraft to tour Western Australia (WA) and the NT. All of the aircraft were hired from the same Jandakot, WA-based operator.

Two of the group returned to Perth in one aircraft after reaching Broome, WA due to other commitments. The three remaining aircraft continued on to the NT.

A number of digital still images and some video footage were recovered from personal cameras that were found amongst the aircraft wreckage. The recovered still images showed that, 1 week before the accident, the accident aircraft and one of the other aircraft were flown below 500 ft above ground level (AGL) along a WA beach. On that flight, the aircraft's pressure altimeter[2] indicated an altitude of 70 ft above mean sea level (AMSL)[3] (Figure 2).

Figure 2: Picture taken from the aircraft 1 week prior to the accident

The recovered video footage of the low-level flight along the WA beach showed the aircraft flying below 100 ft AMSL for about 5 minutes.

A number of the group reported that the accident aircraft was the first to depart Katherine, followed by the other two aircraft at intervals of about 5 minutes. The occupants of the two following aircraft reported that they did not maintain visual

2 Atmospheric pressure instrument calibrated to indicate an aircraft's height above mean sea level.

3 Given the proximity to the waterline, effectively height above ground level.

contact with each other's aircraft, although radio contact was maintained on Very High Frequency (VHF) frequency 123.45 MHz[4].

In addition to the aircraft's radio/avionics equipment, a serviceable hand-held VHF radio was available in the lead aircraft, and was tuned to transmit/receive on frequency 123.45 MHz. The hand-held radio was found in a bag in the aircraft wreckage with its power switch selected OFF.

During the initial 1.5 to 2 hours of the planned flight to Tennant Creek, a number of radio transmissions by the pilots in the lead aircraft were received by the occupants of the two following aircraft. The last radio transmission from the lead aircraft was reported to have been by the right seat pilot at about 30 minutes before the accident, when he asked the occupants of the following aircraft 'do you see the railway?' The occupants of the following aircraft stated that, when they replied that they could not see the railway, the pilot of the lead aircraft indicated that he would go 'a bit lower' to see the highway.

None of the occupants of the two following aircraft reported hearing a radio transmission to indicate a problem with the lead aircraft or its occupants.

Witness information

There were no eye witnesses to the wirestrike. However, the occupants of two vehicles that were travelling respectively south and north on the Stuart Highway immediately to the north of the powerline, reported seeing an aircraft flying low above the highway moments before the accident occurred.

The occupants of the vehicle that was travelling south along the highway reported that they were travelling at 130 kph (equivalent to about 70 kts) with their vehicle set on cruise control. They recalled initially sighting an aircraft that was about 4 to 5 km to the west of the highway, flying in a south-easterly direction at an estimated altitude of 150 ft above ground level (AGL). Shortly after, the aircraft converged with the highway in front of their vehicle, before turning right to track south, and appearing to descend directly above the highway. That manoeuvre was described by one of the vehicle's occupants as being a slow, deliberate turn to line up with the highway. They observed the aircraft tracking along the highway apparently faster than their vehicle for about 30 to 60 seconds, before it was obscured by a crest in the highway some distance in front of them. Shortly after, they saw the wreckage beside the highway. They were the first people to arrive at the accident site.

The occupants of the vehicle that was travelling north reported seeing an aircraft directly above the road at about tree-top height a few moments before it flew over their vehicle. The driver and an adult passenger looked back but were only able to observe the aircraft for a few seconds before it disappeared from view when their vehicle passed over a crest in the road.

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4 Aeronautical Information Publication, En Route Supplement Australia, Nav/Comm-2: 123.45 MHz is available for inter-pilot air-to-air communication within the Australian Flight Information Region.

Personnel information

Two of the three aircraft occupants were qualified pilots and occupied the aircraft's front seats. A number of the members of the touring party reported that the right seat pilot at the time of the accident quite often controlled the aircraft from that seat. The investigation could not determine the pilot flying at the time of the accident.

The left seat pilot held a German private pilot's licence with 379 hours of aeroplane flying experience and was endorsed on Cessna 172 aircraft. In addition, he held a German glider pilot's licence with an unknown amount of gliding experience. He was issued with an Australian certificate of validation by the Civil Aviation Safety Authority (CASA) on 26 September 2007 that was valid until 25 December 2007. Subject to the pilot satisfactorily completing an Aeroplane Flight Review, the certificate of validation allowed him to fly privately by day under the VFR.

The right seat pilot held a German private pilot's licence with 1,634 hours of aeroplane flying experience and was endorsed on Cessna 172 aircraft. In addition, he was a qualified flight instructor and examiner in Germany, and held a glider pilot's licence with extensive gliding experience. He had previously participated in two similar flying tours in Australia, including the same route as that taken on the accident flight. He was issued with a special pilot's licence by CASA on 21 April 1998 that was renewed on 27 July 2004. That licence allowed him to fly privately by day under the VFR. It did not validate his German instructor qualification.

Both pilots satisfactorily completed an Aeroplane Flight Review at Jandakot on 28 October 2007. Neither was approved to conduct low-level operations, and there was no evidence that either had undertaken any low-level flying training.

The pilots had known each other for a number of years and flown together on numerous occasions in Germany and on overseas trips. Both pilots were reported to have been fluent in the English language. Their travelling companions reported that the pilots were well rested and appeared to be in good spirits prior to the flight.

Aircraft information

The aircraft was a single-engine, propeller-driven, high-wing monoplane with a seating capacity of four (Figure 3). It was equipped with dual controls, and could be flown from either the left or right front seats. The pilot in command normally occupied the left seat.

Figure 3: Example of a Cessna 172

Aircraft details

The details of the aircraft and its engine and propeller are at Tables 1, 2 and 3 respectively.

Table 1: Aircraft details

Manufacturer	Cessna Aircraft Company
Model	172N
Serial number	17271888
Registration	VH-WLQ
Year of Manufacture	1979
Total Time Since New	9,045 hours
Date of last maintenance	30 October 2007
Last maintenance type	Periodic / 100 hourly Inspection
Engine type	Lycoming, 0-320
Propeller type	Two blade, fixed-pitch

Table 2: Engine details

Manufacturer	Lycoming
Model	O320-H2AD
Type	Horizontally opposed 4 cylinder
Serial Number	L-1178-76
Time since overhaul (TSO)	1,887.5 hrs (last overhaul 11 June 1999)
Total time in service (TTIS)	Unknown

Table 3: Propeller details

Manufacturer	McCauley
Model	1C160/DTH
Type	Fixed pitch
Serial Number	734606
TSO	2,445.0 hrs
TTIS	9,045.0 hrs

Airworthiness and maintenance

A review of the aircraft's maintenance documentation indicated that:

- all scheduled maintenance was carried out in accordance with the CASA maintenance schedule (Schedule 5)
- all applicable airworthiness directives had been completed
- all maintenance was appropriately documented
- a current maintenance release was issued for the aircraft
- there were no outstanding defects noted on the maintenance release.

Fuel information

The occupants of the two following aircraft reported that all three aircraft were refuelled to 'full' from the same fuel source after the previous day's flying. In addition, prior to the departure from Katherine, the fuel level in each aircraft was physically checked as part of the aircrafts' pre-flight inspections.

An examination of the aircraft's fuel and flight time records for the journey from Jandakot to Katherine suggested an average fuel burn rate of about 31 L per hour.

The aircraft's fuel capacity was 181 L and its fuel burn during the 2-hour flight from Katherine to the accident site was calculated to have been 62 L, suggesting that, at the time of the accident, there was about 119 L of fuel remaining in the aircraft. That and the ability of both following aircraft to reach their destination without incident suggested that the amount and quality of the fuel onboard was sufficient for the flight.

Weight and balance

The requirements of Civil Aviation Regulation (CAR) 235(4) stated that:

> The pilot in command of an aircraft must not allow the aircraft to take off if its gross weight exceeds its maximum take-off weight or, if a lesser weight determined in accordance with a direction under subregulation (2) is applicable to the take-off, that lesser weight.

Weight and balance calculations for the aircraft were carried out using the actual weights of the occupants, the weight of the luggage and equipment that was removed from the wreckage, and the reported fuel quantity on departure from

Katherine. Those calculations indicated that the aircraft was being operated about 79 kg above its maximum take-off weight[5] (MTOW) at that time.

The aircraft's average fuel burn for the journey from Jandakot to Katherine was applied to the 2 hour flight from Katherine. That suggested that, at the time of the accident, the aircraft was about 36 kg above its MTOW.

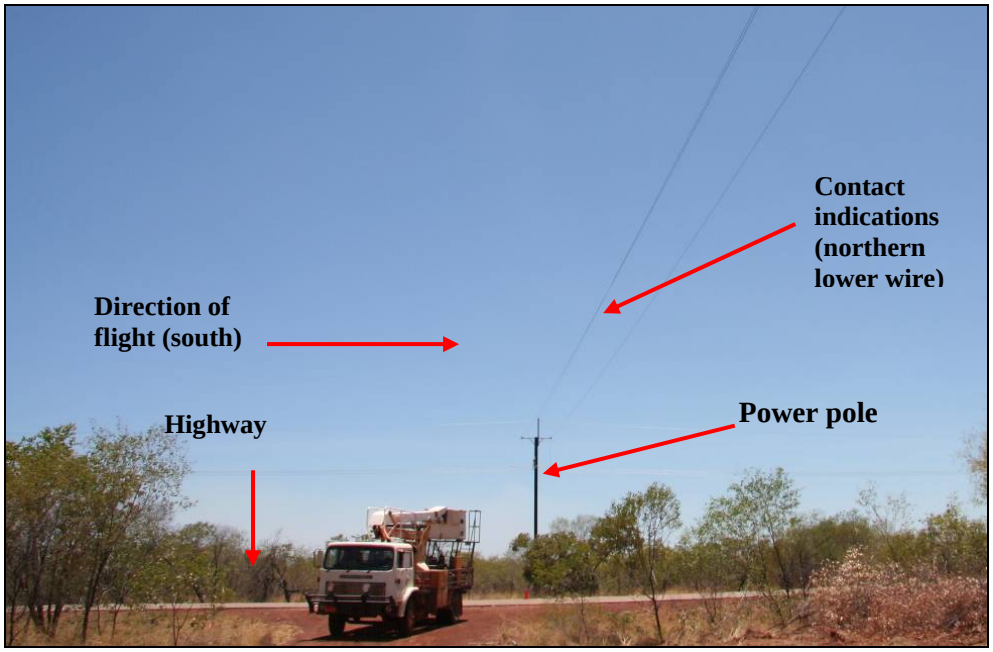
The aircraft's centre of gravity was estimated to be within the aircraft manufacturer's limits at takeoff, and at the time of the accident.

Powerline information

On-site information

The powerline included three wires that were strung between two power poles set about 60 m apart amongst low scrub on either side of the highway. The two lower wires were about 15 m (49 ft) and the upper wire about 16 m (52 ft) above the highway (Figure 4). The northern lower wire had indications of paint transfer from the aircraft's vertical stabilizer and it had also been damaged where it connected to the transformer on the western power pole.

Figure 4: Powerline across the Stuart Highway (upper wire not visible)



5 The maximum certificated take-off weight for an aircraft, which should not be exceeded in other than certification flight testing.

Requirement to mark powerlines

The requirements for marking powerlines and their supporting structures are published in Australian Standard AS 3891.1, 1991, Part 1, *Permanent marking of overhead cables and their supporting structures,* and AS 3891.2, 1992, Part 2, *Marking of overhead cables for low level flying.* The requirements of those standards were discussed in a number of Australian Transport Safety Bureau (ATSB) Aviation Safety Investigation Reports (most recently BO/200600523, available at www.atsb.gov.au), and included that, in general, there was no requirement for the marking of powerlines with a height above roads of less than 90 m (295 ft).

The powerline did not include any markers to increase its visibility, nor did it require such marking in accordance with either standard.

Meterological information

At the time of the accident, the weather conditions in the area included CAVOK[6] and a temperature of about 33° C. The Area Forecast (ARFOR)[7] for the area indicated that the wind at 3,000 ft, or about 1,500 ft above the accident site, was east-south-easterly at 25 kts, and that the visibility could have reduced to 8 km in any smoke.

The pilots of the two following aircraft described the conditions as clear but a 'bit bumpy', with visibility approximately 8 to 10 km.

The occupants of the two vehicles who saw the aircraft moments before the accident did not report any significant reduction in visibility from that forecast for the area.

Wreckage and on-site information

The aircraft struck one of the two 15 m high wires that spanned the Stuart Highway (Figure 4). After striking the powerline, the aircraft travelled 70 m before impacting the ground in a steep nose-down attitude, tipping over and sliding inverted for a further 80 m before coming to rest inverted on the highway verge (Figure 5 – viewed from directly beneath the powerline).

Trajectory analysis calculations were carried out by the investigation after the accident in an effort to establish the aircraft's ground speed when it struck the powerline. Those calculations showed that the aircraft's ground speed at that time was about 72 kts (133.3 kph). However, the deceleration forces from the arresting

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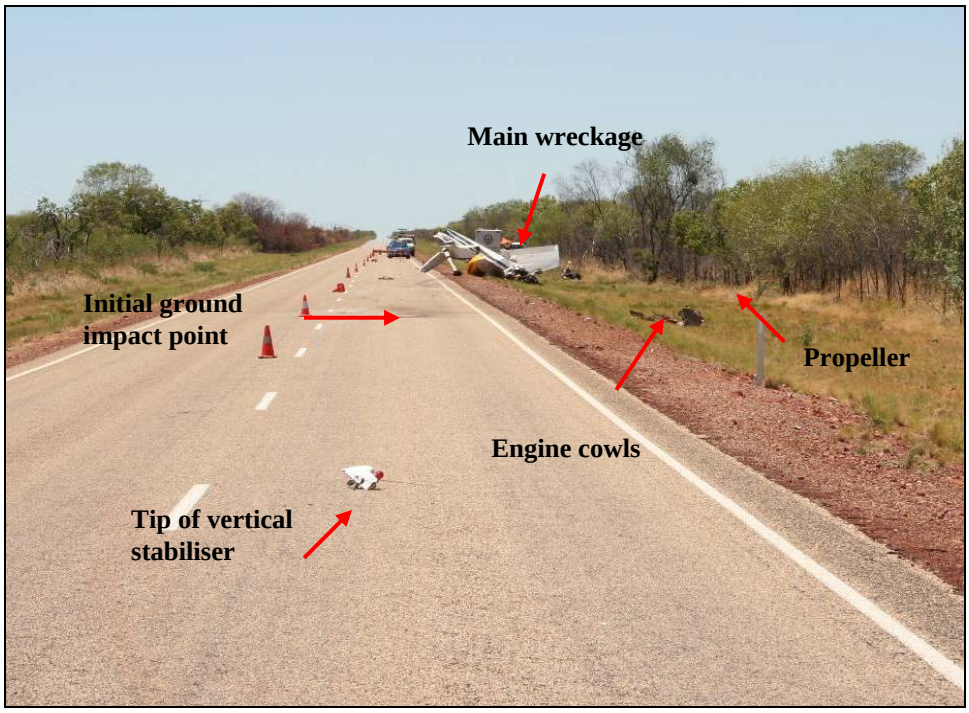
6 CAVOK − used to indicate the simultaneous observation or forecast of: visibility of 10 km or more; no cloud below 5,000 ft or below the highest minimum sector altitude, whichever is the greater, and no cumulonimbus; and no precipitation, thunderstorms, shallow fog, low drifting snow or dust devils.

7 ARFOR - For the purposes of providing aviation weather forecasts to pilots, Australia is sub-divided into a number of forecast areas. The occurrence flight was contained in Area 84.

effect of the tautened powerline could not be calculated and, as a result, the estimated ground speed should be considered a conservative figure.

Figure 5: Accident site and aircraft wreckage - viewed from beneath the powerline, looking south

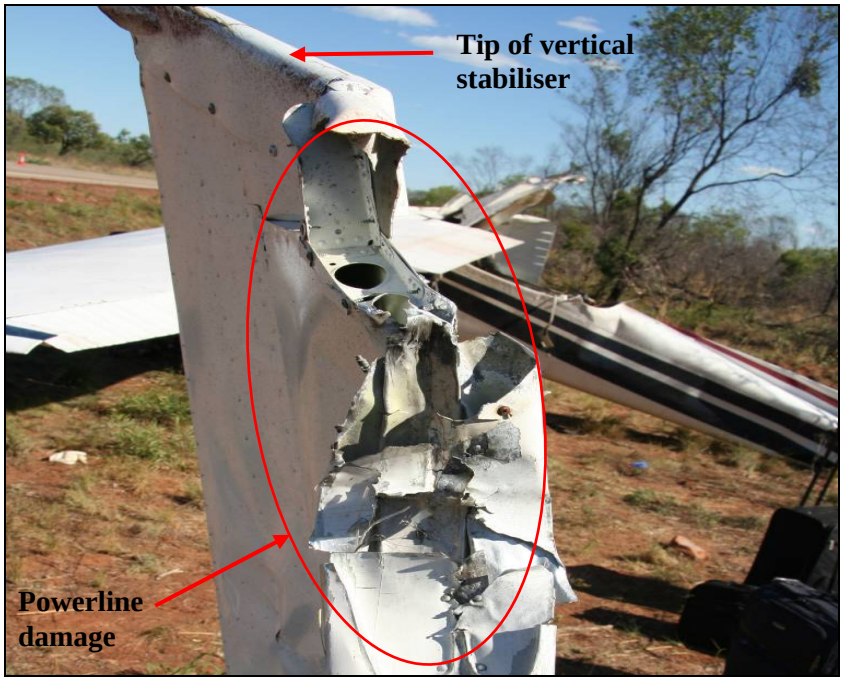


The tail assembly was broken rearwards from the aft fuselage by the impact with the powerline, but remained attached to the fuselage by the rudder and elevator control cables (Figure 6).

Figure 6: Main wreckage

Damage to the leading edge of the aircraft's vertical stabiliser indicated it struck the powerline about 50 cm from the tip of the stabiliser (Figure 7)[8].

Figure 7: Vertical stabiliser showing powerline contact damage



No evidence was found of any pre-impact defects in the aircraft that might have affected the flight. All of the aircraft's components and flight control surfaces were accounted for at the accident site, and continuity of the flight and engine controls was established. The flaps were found in the retracted (zero degree) position.

The security of both of the aircraft's fuel tank caps was confirmed during the on-site examination of the wreckage and there appeared to be no fuel remaining in the tanks. However, by the time that examination was carried out, any remaining fuel may have drained from the fuel tanks as a result of impact damage and/or evaporation. The first person to arrive at the accident scene stated that fuel was escaping from the aircraft and running down the embankment of the highway at that time.

There was no evidence of fire.

The engine was recovered for disassembly and inspection at an engine overhaul facility under the supervision of the ATSB. That disassembly and inspection did not reveal any pre-impact mechanical problem with the engine. However, due to extensive impact damage to the carburettor, magneto assemblies and fuel pump, the serviceability of those items could not be established.

The engine crankshaft was fractured at the crankshaft flange. The fracture surface indicated that the fracture occurred under large bending loads, consistent with the aircraft impacting the highway nose-first, in a steep, nose-down attitude (Figure 8).

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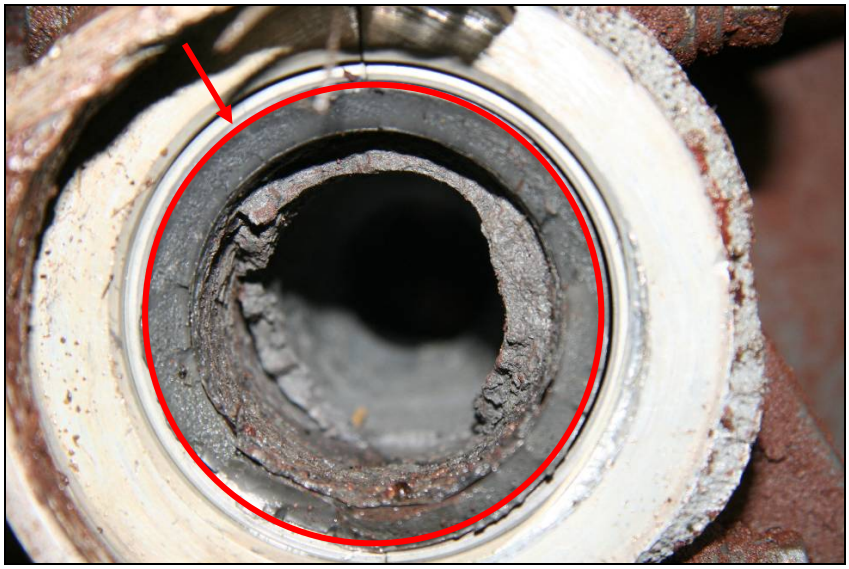
8 The elevator and rudder cables were cut to facilitate the removal of the tail assembly, which was then moved from where it came to rest following the accident. Figure 7 is not, therefore, indicative of the post-impact position of the vertical stabiliser.

Figure 8: Engine crankshaft fracture surface



The propeller was located in scrub a short distance to the west of the highway. No defects were found during the on-site investigation regarding the serviceability of the propeller prior to impact. The damage to the spinner and leading edges of the propeller blades indicated that the propeller was rotating at impact, although the amount of engine power at that time could not be determined (Figure 9).

Figure 9: Propeller and spinner

A hand-held Global Positioning System (GPS) receiver with an external antenna was found attached to a pilot's knee-pad[9] within the aircraft wreckage. Aircraft navigation data can often be recovered from the non-volatile memory of certain hand-held GPS receivers. However, that function had been deselected in the unit that was attached to the knee-pad, and no data was recorded during the flight from Katherine.

Medical information

Post-mortem and toxicological examination of the pilots found no evidence of any physiological or other condition that may have contributed to the accident.

9 A notepad that can be strapped as a unit to a pilot's leg.

Survival aspects

The aircraft was fitted with lap seat belts and sash-type upper body restraints for each occupant. The restraints of all three occupants were found to be correctly fitted and secured. Given the aircraft's speed and its steep impact angle, the accident was not survivable.

Emergency locater transmitter

The requirements of CAR 252A allowed for the carriage in the aircraft of a portable emergency locator transmitter (ELT) in place of an installed transmitter.

The aircraft was not fitted with an ELT at the time of the accident. However, a portable ELT was found in one of the aircraft occupant's bags, but had not been activated.

Organisational information

The regulatory and pilot competency requirements affecting the conduct of low-flying operations have been examined in a number of ATSB wirestrike investigations, most recently in Aviation Safety Investigation Report BO/200600523 (available at www.atsb.gov.au). Those requirements and their effect on the conduct of a private flight are summarised in the following paragraphs.

Regulatory framework affecting the conduct of low-flying

With certain provisos, CAR 157 required pilots in command to not fly aircraft over cities, town or populous areas below a height of 1,000 ft, or any other area at a height lower than 500 ft. In the case of a private aeroplane flight, those restrictions applied unless: stress of weather or another unavoidable cause required flight at a lower height; the owner or operator of the aircraft had received a permit from CASA that authorised the flight or flights at a lower height; the pilot was carrying out, or training for a baulked approach; the aircraft was either taking off or landing at an aerodrome; or the pilot was engaged in search and/or rescue operations, or in operations that required the dropping of supplies, packages or other authorised articles.

The accident flight was not an operation that might have modified the 500 ft minimum height requirement of the CAR at the time of the wirestrike.

Pilot competencies affecting the conduct of low-level operations

The Day (VFR) Syllabus Aeroplanes supports the various aeroplane licences.[10] Limited exposure of all prospective aeroplane pilots to the hazards associated with, and conduct of low flying is achieved via that syllabus.

In addition, a number of other low-level ratings and approvals affect the conduct of agricultural and aerial stock mustering operations in the low-level environment. The additional pilot competency requirements of those ratings and approvals were

10 The Day (VFR) Syllabus Helicopters similarly supports the various helicopter licences.

outlined in investigation report BO/200600523, and include: operational planning aspects, such as the conduct of ground and flight inspections; the location of obstructions and the assessment of wire runs; low flying in undulating terrain; the effect of the sun on visibility; clues and indications of wire runs; and so on.

It could be expected that those additional pilot competencies would enhance the ability of pilots carrying out those operations to identify and avoid wires and other low-level hazards.

Additional information

Flap settings for forced landings

The emergency procedures section of the Cessna 172N pilot information manual recommended the use of full flaps in the event of an emergency landing with or without engine power.

Wirestrike accidents and incidents

In September 2006, the ATSB reissued its aviation research paper *Wire-strike Accidents in General Aviation: Data Analysis 1994 to 2004*[11], which examined the reported wirestrike accidents in general aviation in Australia from 1994 to 2004. In part, the paper provided an overview of the reported wirestrikes in general aviation operations, together with their associated characteristics, for that period.

The paper found that 119 wirestrike accidents were reported to the ATSB between 1994 and 2004. The breakdown of those accidents included that 18 involved private/business operations, of which seven, or 39 per cent involved low-level operations that were remote from a landing area or aerodrome. That accident rate highlighted the dangers associated with low-level operations, especially for pilots who have not received specialised training in that environment.

Subsequently, in the period 1 January 2005 to 10 November 2007 inclusive, there were an additional 6 reported private/business wirestrike accidents.

Overall, there were 55 fatalities as a result of wirestrike accidents in Australia over the period 1994 to 10 November 2007 inclusive. The average number of wirestrike accidents during that period was just over 9 per year, and the average number of fatalities per annum was four.

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11 ATSB Aviation Research and Analysis Report – B2005/0055, *Wire-strike Accidents in General Aviation: Data Analysis 1994-2004*, available at http://www.atsb.gov.au/publications/2006/wirestrikes_20050055.aspx..

Efforts to reduce the risk of wirestrike

A number of strategies are available to pilots and operators in order to minimise the risk of a wirestrike. In the first instance, pilots should minimise unnecessary exposure to low-level hazards by restricting low-level operations to the maximum extent possible. Additional risk management options include reducing the:

- consequence of a wirestrike, including by the use of helmets and full-cover clothing and, where possible, by the installation on the aircraft of wirestrike protection equipment
- likelihood of a wirestrike, which emphasises the importance of pilots identifying and then avoiding any powerlines in their area of operation. The factors with the potential to affect the visibility, and therefore subsequent avoidance of powerlines included the:
  - pilot's prior knowledge of the location of any powerlines
  - presence and visibility of any supporting structure(s) and the pilot's interpretation of that/those structure(s)
  - diameter and make-up (or alloy) of the wire
  - nature of the visible background to the wire; ambient light, in terms of its angle and intensity; and the presence or influence of any illusions.

The extensive efforts by the aviation industry in an effort to reduce the incidence of wirestrikes were outlined in Aviation Safety Investigation Report BO/200600523. In addition, a number of safety issues were identified, actions taken and safety recommendations made as a result of that investigation in order to address those issues. That included:

- consideration of the development by CASA of a Civil Aviation Order (CAO) that would require anyone carrying out low-level operations to satisfy the intent of the low-level flying standards of draft Civil Aviation Safety Regulation (CASR) Part 61
- the issue of ATSB safety recommendation 20070013, which sort to minimise the unnecessary exposure of aircraft and crews to low-level hazards, including powerlines, in an attempt to reduce the risk of a wirestrike
- the issue of ATSB safety recommendation 20070014, in an attempt to make low-level operational guidance material widely, permanently and generally available for use by pilots, operators and prospective low-level aerial campaign managers
- consideration of the feasibility of the establishment of a national database of information on the location of known powerlines and tall structures for access by pilots, operators and managers of aerial campaigns.

ANALYSIS

The fine weather at the time of the wirestrike, and the lack of any physiological or other medical condition that may have contributed to the accident, suggested two possible scenarios to explain the operation of the aircraft at low level. In the first instance, an emergency of some kind may have required an immediate attempt to land by the pilot. Alternately, the pilot may have intentionally engaged in low-level flight.

In either case, the operation of the aircraft above its maximum take-off weight (MTOW), and the effect on the manoeuvrability of the aircraft, could not be conclusively established. However, it may have negatively affected any manoeuvre to avoid the powerline in the event that such avoidance action was attempted by the pilot.

Possibility that the pilot was attempting an emergency landing

The witness, physical and other evidence was consistent, and suggested that the aircraft had sufficient engine power to sustain level flight prior to the wirestrike. Similarly, while a number of the engine accessories were unable to be tested due to impact damage, there was no evidence that the aircraft or its engine were incapable of normal operation at that time.

In addition, the configuration of the aircraft was inconsistent with that recommended by the aircraft manufacturer in the case of an attempt by the pilot to land, or to recover from an engine failure or other emergency. That was corroborated by the lack of a distress or other transmission by the pilot on the aircraft's apparently operational radio, via the available hand-held radio, or by the activation of the onboard portable emergency locator transmitter (ELT).

The investigation concluded that the pilot was not attempting to land when the aircraft struck the powerline.

Conscious pilot decision to low fly

The lack of any low-level training undertaken previously by the pilots could be expected to have limited their awareness of the hazards associated with operations at low level. In addition, the lack of such training could be expected to have minimised the likelihood of their identifying and then avoiding the powerline. Moreover, although not required by the Australian Standards affecting the marking of powerlines and their supporting structures, the installation of high visibility markers might have increased the likelihood that the pilots might have identified the powerline.

Notwithstanding, had the pilots complied with the requirements of Civil Aviation Regulation (CAR) 157, and not descended below 500 ft above ground level (AGL), the risk of a wirestrike would have been eliminated. However, the video and still images taken during a previous leg of the party's aerial tour showed an acceptance by the pilots of the risk of unnecessary and unauthorised exposure to the hazards associated with such flight.

On that basis, and in the absence of any evidence to the contrary, the investigation concluded that the descent to, and ongoing flight at low level was probably as a result of a conscious decision by the pilots.

FINDINGS

From the evidence available, the following findings are made with respect to the wirestrike involving Cessna Aircraft Company 172N, registered VH-WLQ, and should not be read as apportioning blame or liability to any particular organisation or individual.

Contributing safety factors

- The aircraft stuck a powerline that spanned the Stuart Highway.
- The aircraft departed from controlled flight and impacted the ground.
- The aircraft was, without authorisation, being flown below 500 ft above ground level (AGL).

Other safety factors

- The pilots accepted the risk of unnecessary and unauthorised exposure to the hazards associated with flight at low level.
- The aircraft was being operated above its maximum take-off weight (MTOW).
- The pilots had not completed any low-level flying training.

Other key findings

- In accordance with the extant Australian Standards affecting the marking of powerlines and their supporting structures, there was no requirement for the powerlines to be fitted with high visibility markers.
- The investigation was unable to establish which of the pilots was flying the aircraft at the time of the accident.