Australian Government
Australian Transport Safety Bureau

VFR flight into dark night conditions and loss of control involving Cessna T210N, VH-MEQ

2 km north-west of Roma Airport, Queensland | 25 March 2013

Investigation

ATSB Transport Safety Report
Aviation Occurrence Investigation
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Addendum

Page	Change	Date

Safety summary

What happened

VH-MEQ

Source: M. Quintana

At about 0518 Eastern Standard Time on 25 March 2013, a Cessna T210N aircraft, registered VH-MEQ, took off in dark night conditions from runway 36 at Roma Airport on a flight to Cloncurry, Queensland. Following the activation of the aircraft's emergency locator transmitter, a search was commenced for the aircraft by the Australian Maritime Safety Authority. It was subsequently located 2 km to the north-west of the airport, having collided with terrain while heading in a south-westerly direction. The aircraft was destroyed and the pilot and passenger were fatally injured.

What the ATSB found

The ATSB found that the departure was conducted in dark night conditions, despite the pilot not holding a night visual flight rules rating and probably not having the proficiency to control the aircraft solely by reference to the flight instruments. During the climb after take-off, the pilot probably became spatially disorientated from a lack of external visual cues, leading to a loss of control and impact with terrain.

No mechanical defect was identified with the aircraft or its systems that may have contributed to the accident.

Safety message

This accident reinforces the need for day visual flight rules pilots to consider the minimum visual conditions for flight, including the relevant weather information and usable daylight. In this case, if the pilot had delayed the departure by 30 minutes, the flight would most likely have progressed safely in daylight conditions.

There are numerous airports in Australia, including Roma, that have an abundance of ground lighting in one take-off direction but not another. This accident highlights the potential benefits of night visual flight rules and instrument-rated pilots considering the location of ground lighting when planning night operations.

Finally, the benefit of crash-activated emergency locator transmitters that include global positioning system-based location information, thereby providing for a timely emergency response in the event of an accident, is emphasised.

Contents

The occurrence

On the morning of 25 March 2013, the pilot of a Cessna T210N aircraft, registered VH-MEQ (MEQ), planned to fly with a business colleague from Roma to Cloncurry, Queensland. The pilot was also the owner of the aircraft.

The pilot had flown the aircraft from Toowoomba, Queensland, to Roma on the morning of 24 March 2013. The flight to Cloncurry was initially planned for that afternoon, but was delayed because of other commitments. No evidence was found that the pilot had any time constraints necessitating an early departure on 25 March 2013.

The pilot of another aircraft that departed from Roma at 0455 Eastern Standard Time[1] on 25 March 2013 recalled seeing the occupants of MEQ arrive at the airport by car. The pilot of this aircraft recalled that as he taxied for take-off, he saw MEQ on the tarmac with the engine running.

At 0500, the automatic fuel bowser at Roma recorded the start of a fuel purchase for MEQ. The amount of fuel purchased was consistent with the amount of fuel normally consumed by a Cessna T210N aircraft type on a flight from Toowoomba to Roma, such as by the pilot of MEQ the previous day.

A witness who lived to the south of Roma Airport reported that sometime between 0515 and 0530, he heard the engine of a single-engine aircraft increase power for take-off before stopping suddenly. This was before the commencement of daylight at Roma at 0548 (see the section titled *Meteorological information*).

The witness recalled that the engine sounded normal throughout the flight and described hearing a characteristic change in the propeller noise shortly before the noise of the engine suddenly stopped. This change in the propeller noise was described by the witness as being consistent with that normally associated with an aircraft changing direction in relation to the listener. The witness stated that if the aircraft took off from runway 18 at Roma,[2] it would have flown overhead his location, and that did not happen. He therefore assumed that the aircraft took off from runway 36, away from his location.

The only runway that was suitable tor operations in darkness at Roma was runway 18/36, as the other runway was not equipped with runway lighting (see the section titled *Aerodrome information*). The track from Roma to Cloncurry was 305° magnetic.

Another witness reported being outdoors at the time of the accident, about 2 km north-west of Roma Airport. This witness reported hearing the sound of an aircraft, then the sound of a crash and then silence. A few minutes later, the witness called the police. The police recorded receiving this call at 0525.

At 0519, a signal from an emergency locator transmitter (ELT) that was registered to MEQ was received by the New Zealand and Russian Geostationary satellite local user terminals. This signal did not contain any information in respect of the location of the ELT.

Based on the witness reports and receipt of the ELT signal, a search for the aircraft was commenced by the Australian Maritime Safety Authority.[3] A search and rescue helicopter subsequently reported sighting a crashed aircraft to the north-west of Roma Airport (Figure 1). Soon after, emergency services personnel confirmed that the aircraft was MEQ.

The pilot and passenger sustained fatal injuries and the aircraft was destroyed by impact forces.

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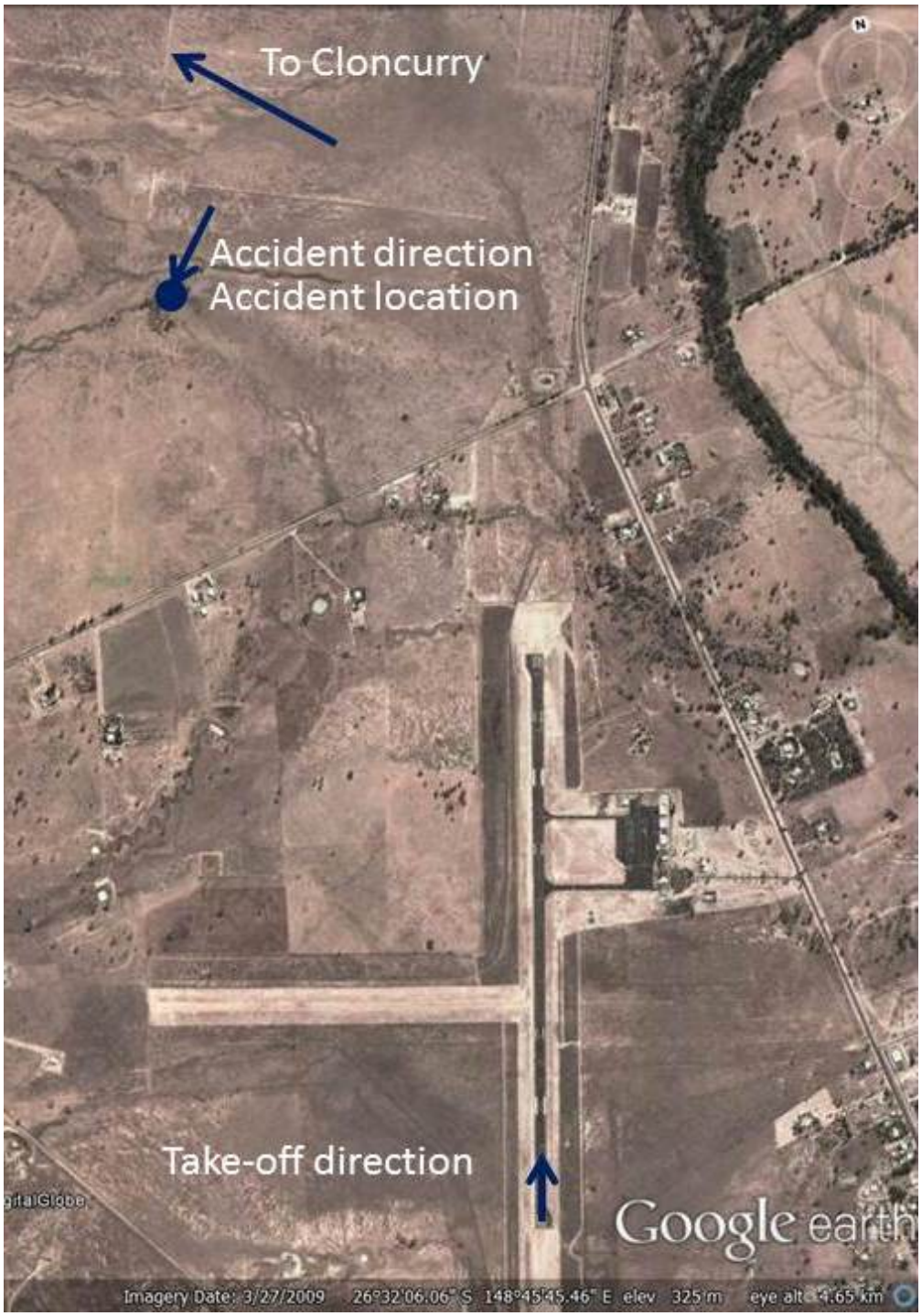
1 Eastern Standard Time (EST) was Coordinated Universal Time (UTC) + 10 hours.

2 Runways are named by a number representing the magnetic heading of the runway.

3 The Australian Maritime Safety Authority operates a 24-hour rescue coordination centre and is responsible for the national coordination of search and rescue.

Figure 1: Location of the accident with the track to Cloncurry and the directions of take-off and impact highlighted



Source: Google earth (modified by the ATSB)

Context

Pilot information

Qualifications and experience

The pilot had held an Australian Private Pilot (Aeroplane) Licence since 1992, when the pilot converted his US Private Pilot Certificate to the Australian licence, instead of undertaking the full Australian pilot licence training syllabus. Unless the pilot held a night visual flight rules (VFR) or a command instrument rating, and satisfied stipulated recency requirements, the Australian licence authorised the pilot to fly aircraft in visual meteorological conditions[4] by day only.

The pilot stated in an earlier application for an aviation medical certificate that he had 6,000 hours total aeronautical experience in August 2011. Witnesses reported that the pilot had not flown for a period of about 10 years before 2011, but had flown regularly since.

The pilot completed an aeroplane flight review in MEQ within the previous 2 years. That review assessed the pilot's aircraft operation and navigational procedures in day visual conditions as being satisfactory.

Medical information and recent history

The pilot held a current Class 2 Aviation Medical Certificate that was issued by the Civil Aviation Safety Authority (CASA). The only restriction on the medical certificate was that reading correction was to be available while exercising the privileges of the pilot licence.

Although reportedly being treated for insomnia, the pilot was reported to be well rested up until the day before the accident. Based on the witness reports and other information (see the earlier section titled *The occurrence*), it is likely the pilot woke at about 0400 on the day of the accident. However, the amount and quality of the pilot's sleep that night could not be determined.

Records of previous night flights

The Australian Transport Safety Bureau (ATSB) reviewed the available landing records for MEQ at country aerodromes since the aircraft was first imported into Australia in October 2011 (see the section titled *Aircraft information*). Only one night flight was identified, and that flight was flown by a different pilot. No evidence was found of the accident pilot flying at night in Australia.

A witness who had previously flown with the pilot reported that he avoided taking off before daybreak, so that any animals on the runway could be seen.

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[4] Visual meteorological conditions is an aviation flight category in which visual flight rules (VFR) flight is permitted—that is, conditions in which pilots have sufficient visibility to fly the aircraft maintaining visual separation from terrain and other aircraft.

Aircraft information

The aircraft was manufactured in the United States and imported into Australia in 2011. Table 1outlines its technical and other details.

Table 1: VH-MEQ technical and other details

Manufacturer	Cessna Aircraft Company
Model	T210N
Serial Number	21064869
Registration	VH-MEQ
Year of manufacture	1984
Australian Certificate of Airworthiness	Issue date 7 October 2011
Australian Certificate of Registration	Issue date 19 August 2011
Maintenance Release	Valid to 1,934 hours or 6 December 2013
Total airframe hours	1,868.1[5]
Engine manufacturer	Continental
Engine model	TSIO-520-R
Engine type	Horizontally-opposed, six-cylinder, turbocharged and fuel-injected engine
Serial Number	522552
Time since overhaul	198.8 hours

The aircraft had a current maintenance release, Certificate of Registration and Certificate of Airworthiness. It was maintained and certified to a night VFR standard in the Airwork category in accordance with CASA Maintenance Schedule 5. No anomalies were recorded in the aircraft maintenance documentation that would suggest the serviceability of the aircraft was a factor.

Aircraft maintenance staff at Toowoomba Airport reported that, on the weekend before the accident, the pilot had stated that there was a problem with the aircraft's landing gear. The landing gear was found retracted at the accident site, consistent with its normal operation after take-off.

Meteorological information

Weather conditions

The relevant forecasts and observations for Roma Airport and witness statements indicated fine weather and light winds at the time of the accident.

Illumination

At the time of the accident, the moon had set and the sun was about 12° below the horizon to the east. For aviation purposes, daylight starts when the sun is 6° below the horizon which, on the morning of the accident, occurred at 0548. This was about 30 minutes after the aircraft took off. As such the only celestial illumination at the time of take-off would have been starlight. In addition,

[5] The maintenance release airframe hours had not been kept up to date. The aircraft hours were derived from the aircraft hour meter in the aircraft and a comparison between the hour meter hours and airframe hours recorded on the maintenance documentation.

due to the take-off direction being away from Roma township, there was very limited ground (terrestrial) lighting to provide visual cues to the pilot during the climb.

Communications

As a certified non-towered airport, unless specifically exempted, the carriage of and qualification to use radio for communication using the common traffic advisory frequency (CTAF)[6] was mandatory at Roma. The Aeronautical Information Publication Australia listed a number of recommended broadcasts when taxiing or entering a runway at a non-towered aerodrome and a mandatory broadcast, if it was reasonably necessary to do so, to avoid a collision or the risk of a collision.

Studies have shown that in the absence of a traffic alert, the probability of a pilot sighting a threat aircraft is generally low until shortly before impact and traffic alerts have been found to increase search effectiveness by a factor of eight. The effectiveness of traffic alerts from air traffic services (ATS) or from pilot broadcast in reducing the risk of collision was highlighted.[7]

Communication with ATS was available on the ground at Roma Airport on a different radio frequency. The CTAF and ATS frequencies were recorded, and no transmission or broadcast by the pilot of MEQ was recorded on either frequency during the taxi, take-off or flight, nor were they required. However, at 0512 a transmission of less than 1 second was recorded on the CTAF that may have been the sound of a taxiing piston-engine aircraft.

Aerodrome information

Roma Airport is located about 3.5 km north-west of Roma township and services numerous turboprop airline operations and a diverse range of private and commercial operations. The airport has two runways aligned in the 09/27 (092/272 °M) and 18/36 (182/002 °M) directions. Runway 18/36 is a 1,504 m long tarmac runway with runway lighting. Runway 09/27 is 801 m long and is not fitted with lighting.

There is no significant ground lighting beyond the northern end of runway 36 when taking off on that runway. However, there is extensive ground lighting associated with the township when taking off on runway 18.

Recorded information

The aircraft was not fitted with a flight data recorder or a cockpit voice recorder, nor were these recorders required by the relevant aviation regulations.

Two tablet computers and a mobile phone were recovered from the accident site and examined by the ATSB. None of the devices recorded any global positioning system location information for the period surrounding the accident.

Wreckage and impact information

The accident site was located 1.4 km to the north-west of the departure end of runway 36,[8] close to a stand of large trees surrounded by an area of open, relatively flat terrain. The wreckage trail was about 200 m long with a minimal splay to the left and right of the trail (Figure 2), consistent with a relatively high forward speed at impact. The aircraft's direction of flight was about 210 °M at that time and the aircraft's descent angle relative to the slightly rising terrain was calculated to be about 13°.

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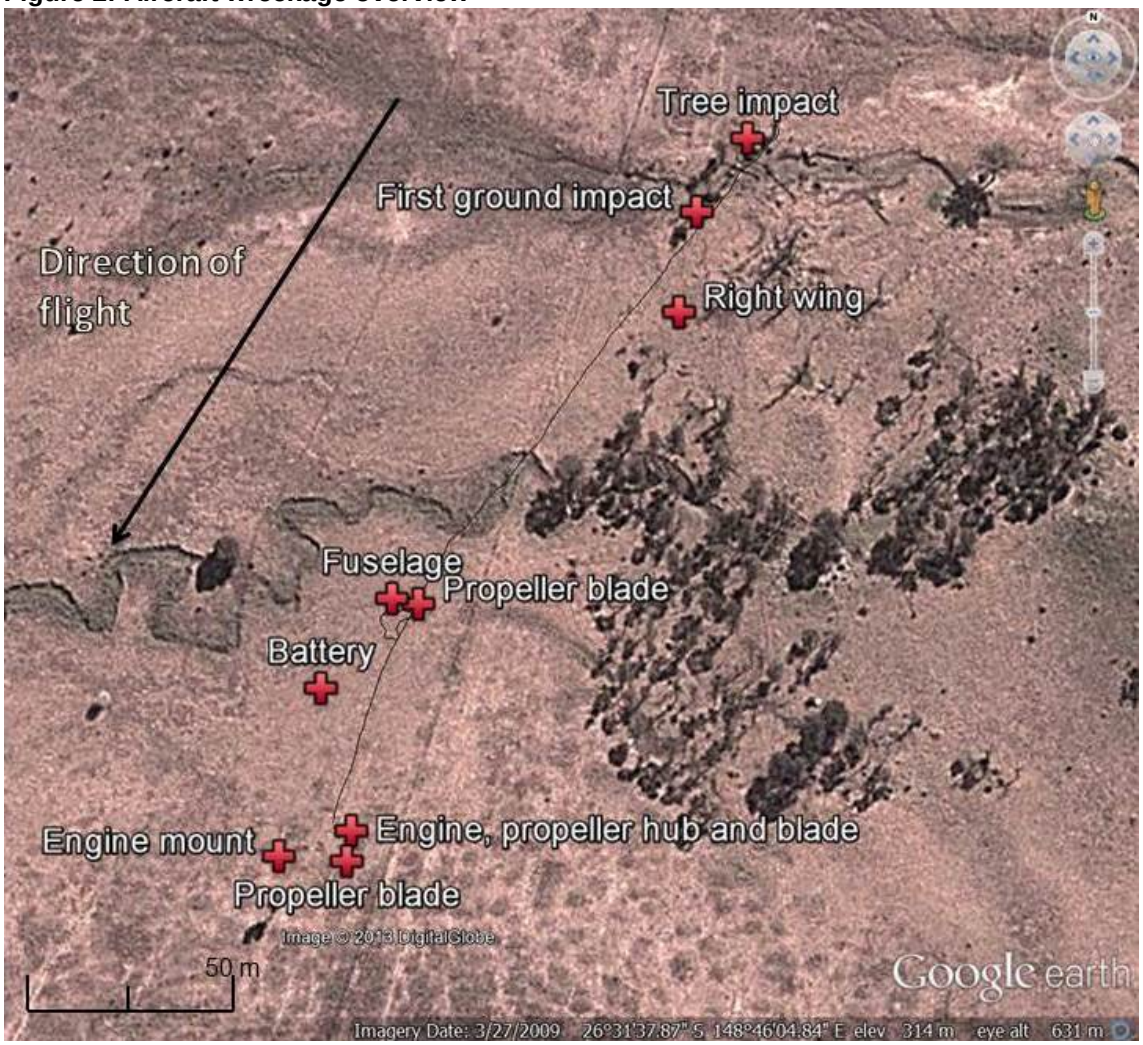
6 Common Traffic Advisory Frequency is the frequency on which pilots operating at a non-towered aerodrome should make positional radio broadcasts.

7 The ATSB research report titled *Limitations of the See-and-Avoid Principle* examined the role and limitations of this principle and is available at www.atsb.gov.au.

8 Equivalent to 2 km north-west of the aerodrome reference point.

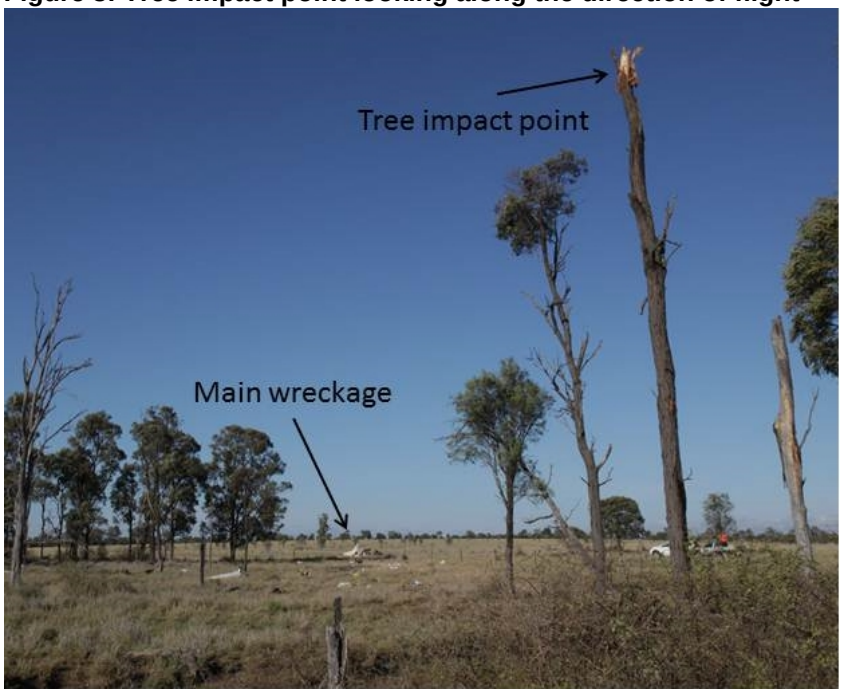
Figure 2: Aircraft wreckage overview



Source: Google earth (modified by the ATSB)

The aircraft's initial impact was with a tree that was struck approximately 8 m from its base by the right wing (Figure 3). The right wing outboard section separated from the aircraft before the aircraft impacted the ground.

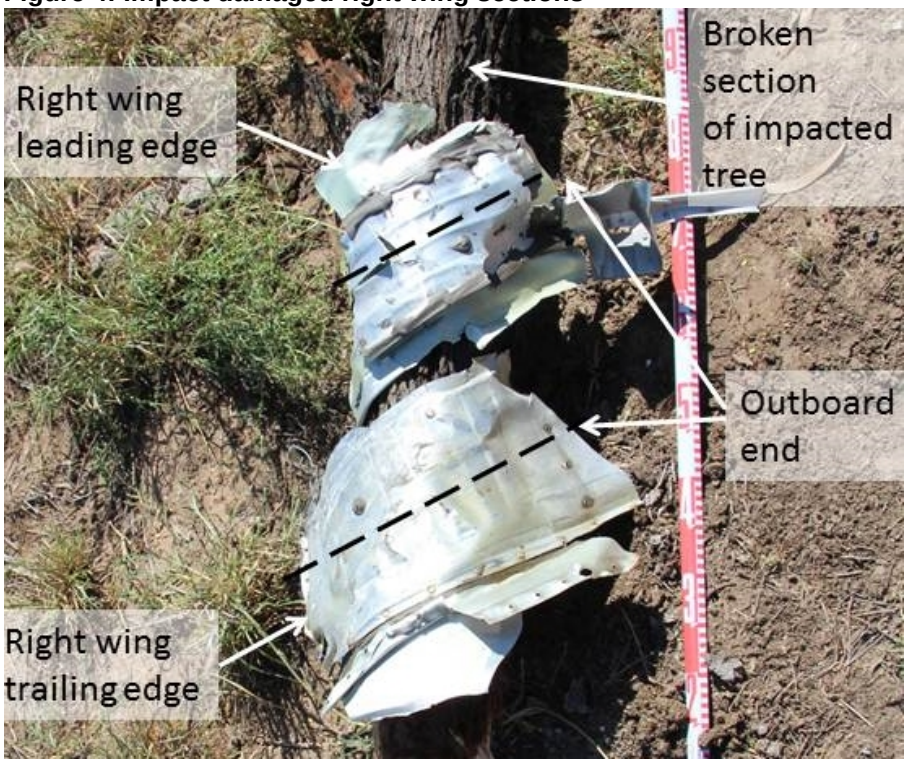
Figure 3: Tree impact point looking along the direction of flight



Source: ATSB

Sections of the right wing leading and trailing edges showed damage consistent with the shape of the tree that was struck in the initial impact (Figure 4). Examination of these wing sections revealed that the aircraft struck the tree at a bank angle of about 30° left wing-low.

Figure 4: Impact damaged right wing sections



Source: ATSB

An inspection of the airframe revealed that all sections were accounted for on the accident site, with no pre-impact defects identified.

Propeller and spinner damage indicated that the engine was driving the propeller at medium-to-full power when the aircraft impacted terrain. The engine turbocharger and its components were inspected externally and no pre-impact defects were identified. The turbocharger sustained a significant impact during the accident sequence that deformed the compressor section case such that the compressor blades contacted the deformed case. The contact marks made by the compressor blades showed rotational scoring that was consistent with turbocharger rotation at significant speed when the aircraft impacted terrain (Figure 5).

Figure 5: Compressor section of turbocharger showing rotational damage

Source: ATSB

The engine-driven vacuum system provided pressure to drive the rotating gyro rotor inside the aircraft's attitude indicator. This instrument would have provided attitude information to the pilot in the absence of a visual horizon. An inspection of the vacuum system did not identify any pre-impact defects.

The flap control surfaces and the flap actuator were in the fully-retracted position. Inspection of the landing gear revealed that they were in the retracted position when the aircraft impacted terrain. The position of each was consistent with pilot action to retract the controls and gear after take-off.

Medical and pathological information

Post-mortem examination by the relevant state authority indicated the pilot succumbed to multiple impact-related injuries. No medical conditions were identified that could have affected the pilot's performance.

Toxicological testing of the pilot identified low concentrations of prescribed medications that were consistent with the pilot's reported treatment for insomnia. A specialist assessment of those findings that was conducted on behalf of the ATSB found that:

> The influence of the detected drugs on the pilot's ability to make safe decisions is likely to be extremely low...
>
> The pilot's ability to identify and manage spatial disorientation is highly unlikely to have been influenced by the detected medications.

Survival aspects

The aircraft was equipped with a Wulfsberg Electronics ME406 emergency locator transmitter (ELT). The ELT activated on impact and broadcast a distress signal that included a unique identifying code for MEQ. The signal was received by the New Zealand and Russian Geostationary satellite local user terminals, who advised the Australian Maritime Safety Authority's (AMSA) Rescue Coordination Centre. Although the ELT was not equipped with a global positioning system capability, meaning that the distress signal did not include position information, AMSA commenced a search for the aircraft.

The ELT was identified by the ATSB intact in the wreckage, although the aircraft skin with the ELT antenna attached was partly torn away from the airframe. However, the antenna was still connected to the ELT and functional because the installation design incorporated a connecting cable that was much longer than required. This allowed the two components to move apart during the accident sequence without severing the cable (Figure 6).

Figure 6: ELT antenna

Source: ATSB

Spatial disorientation

Overview

Spatial disorientation (SD) occurs when a pilot does not correctly sense the position, motion and attitude of an aircraft in relation to the surface of the Earth. It is often simply described as the inability to determine 'which way is up', although the effects of disorientation can be considerably more subtle than that description.

Pilots obtain information about their orientation from:

- The visual system (eyes), which can obtain information from a range of cues outside the aircraft and relevant flight instruments inside the aircraft.
- The vestibular system, which consists of the balance organs located in the inner ears. The semicircular canals provide information about angular or rotational accelerations in the normal (yaw), lateral (pitch) and longitudinal (roll) axes, and the otolith organs provide information about linear accelerations.
- The somatosensory system, which includes a range of receptors in the muscles, tendons, joints and skin that sense gravity and other pressures on the body. Such perceptions are often known as the 'seat of the pants' aspect of flying.

The visual system generally provides about 80 per cent of a person's raw orientation information, with the remainder provided by the vestibular and somatosensory systems, both of which are prone to misinterpretation and illusions during flight (Newman 2007). Although the visual system can overcome these limitations, the risk of SD is significantly increased if the relevant visual cues are absent, ambiguous or not attended to.

Nature of spatial disorientation accidents

Almost all pilots will experience SD events at some time, but the events are usually recognised and do not result in adverse consequences. Nevertheless, SD has always been involved in a significant proportion of aviation accidents, particularly those with more serious consequences.

When SD does result in an accident, it is usually in the form of a controlled flight into terrain or in-flight loss of control, resulting in a collision with terrain or in-flight break-up. With most SD accidents, the pilot does not recognise the problem, or at least does not recognise it in time to effectively recover from the situation. This unrecognised SD, often known as Type I, can occur for an extended period of time lasting up to tens of seconds or even longer (Previc and Ecoline 2004).

A range of factors can influence the extent to which a pilot may experience SD or be able to recover from SD. Common factors include limited or ambiguous visual cues outside the cockpit, not directing sufficient attention to the flight instruments due to workload or distraction, and not being proficient in instrument flying skills.

Many types of sensory illusions can result in gradually increasing bank angles and undetected and uncorrected descent. These include roll movement below the pilot's detection threshold, the 'leans' (where the sudden detection and correction of a gradual roll leads to misperceptions about roll), somatogyral illusion (where prolonged exposure to angular rotation leads to that rotation no longer being accurately perceived) and somatogravic illusion (where the perception of the orientation of the aircraft relative to the earth is distorted due to the combination of centrifugal and linear forces).

Somatogravic illusions

If an aircraft that has been trimmed for level flight is then rolled into a steady, balanced turn in the absence of an external visible horizon, the resultant force based on the combination of the linear and centrifugal forces will provide a sensation that the aircraft is flying wings level, albeit with a slightly increased normal gravitational force (g) depending on the angle of bank. The increased g force is provided by pilot application of up elevator to maintain altitude, as the aerodynamic lift

vector is perpendicular to the wings and no longer opposite the gravitational force. If a pilot becomes unaware that the aircraft is in a steady turn, the pilot may reduce the g force to that normally expected in level flight. That control input is normally accomplished by relieving the up elevator control input required to maintain level flight in a turn. If this happens, the aircraft will normally descend in a turn while the pilot feels 1 g force, which is the same as the force normally experienced in straight and level flight.

Vestibular illusions can be managed effectively in the absence of external visual cues by reference to suitable aircraft instrumentation. However, controlled flight by sole reference to cockpit instruments is a separate learned skill from the skills associated with flight in visual conditions. A loss of control without a visible external horizon is frequently lethal, and a high skill level is required to ensure safe flight. The required skills are maintained by initial training and recurrent, recent practice. Any lack of training or recent practice will reduce the requisite skills needed to ensure safe flight in the absence of sufficient external visual cues.

Related occurrences

Many aircraft accidents have occurred at night. The CASA Civil Aviation Advisory Publication (CAAP) 5.13-2(0), *Night Visual Flight Rules Rating*, stated that:

> Night flying accidents are not as frequent as daytime accidents because less flying is done at night. However, statistics indicate that an accident at night is about two and a half times more likely to be fatal than an accident during the day. Further, accidents at night that result from controlled or uncontrolled flight into terrain (CFIT or UFIT) are very likely to be fatal accidents. Loss of control by pilots of night visual flight rules (NVFR) aircraft in dark night conditions has been a factor in a significant number of fatal accidents in this country…

ATSB investigation report AO-2011-102[9] detailed 13 accidents in Australia from 1993 to 2012 associated with VFR operations at night. Key features of these accidents listed in appendix F of the report are that almost all resulted in fatalities, almost all occurred in dark night conditions, most of the pilots did not hold a command instrument rating and some of the pilots did not meet the recency requirements for carrying passengers at night. Appendix D of the report provides information about accidents involving gradually increasing bank angle leading to collision with terrain.

The risks specifically associated with night visual flight operations are described with examples in ATSB research report AR-2012-122 *Visual flight at night accidents.*[10] The report concluded that:

> Visual night flying is sufficiently different from both day visual flight and (except in very dark conditions) instrument flight that it needs to be treated as a separate skill in its own right. It requires a disciplined integration of two very different skill sets of instrument flight and degraded visual flight to develop sufficient situational awareness to enable safe flight.

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[9] ATSB investigation report AO-2011-102, *VFR flight into dark night involving Aérospatiale AS355F2 VH-NTV* 145 km north of Marree, South Australia 18 August 2011.

[10] ATSB research report AR-2012-122, *Avoidable Accidents No. 7 Visual flight at night accidents: What you can't see can still hurt you*, 17 December 2013.

Safety analysis

Introduction

The time of receipt of the emergency locator transmitter (ELT) signal indicated that the aircraft impacted terrain when the only available celestial illumination would have been starlight. The following analysis will examine the likely development of the accident involving a day visual flight rules pilot taking off in dark night conditions.

Development of the accident

The intended departure track, witness reports of the take-off direction and the accident location were consistent with the pilot initiating a left turn shortly after take-off to intercept the track to Cloncurry. However, the turn continued through the departure track until the aircraft descended and impacted terrain.

Consideration of the take-off direction identified that there was minimal ground lighting available to assist the pilot to control the aircraft by the use of external visual cues. The conduct of a take-off in such dark night conditions, with no visible external horizon, would have necessitated the pilot controlling the aircraft solely by reference to the flight instruments once airborne.

The pilot of VH-MEQ (MEQ) was not qualified to operate in night conditions and it was unlikely that he had the required level of instrument flight proficiency to safely operate the aircraft in dark night conditions.

If the aircraft was being deliberately turned beyond the track to Cloncurry, the pilot would probably have been returning to land at Roma, and the aircraft's height should have been controlled because the pilot would have been aware of the continuing turn. As the aircraft was descending at high speed, and not controlled or configured in anticipation of a landing, it is unlikely the pilot was aware the turn was continuing beyond the track to Cloncurry.

There was no evidence of any mechanical defect that would have affected the performance of the aircraft or suggested a need to return to the airport for landing.

The likely flight path and impact sequence were consistent with the pilot probably experiencing spatial disorientation due to insufficient external visual cues. This likely disorientation led to a loss of control and collision with the terrain.

Survivability

The Rescue Coordination Centre was promptly notified of the accident by the New Zealand and Russian Geostationary satellite local user terminals after receipt of a crash-activated ELT signal from MEQ. Although the distress alerting provided by the ELT did not assist the aircraft occupants in this occurrence, the carriage of crash-activated ELTs generally provides for a more timely emergency response.

Furthermore, if the ELT had a global positioning system (GPS)-based location capability, the rescue centre would have been able to quickly ascertain the precise accident location, rather than having to rely on the available witness and other information. If the aircraft had crashed elsewhere on its planned long flight over remote terrain to Cloncurry, where there was a reduced likelihood of witness and other information on the progress of the flight, the search would have probably taken even longer in the absence of GPS-based location information.

Findings

From the evidence available, the following findings are made with respect to the visual flight rules flight into dark night conditions and loss of control that occurred 2 km north-west of Roma Airport, Queensland, on 25 March 2013 and involved Cessna T210N, registered VH-MEQ. They should not be read as apportioning blame or liability to any particular organisation or individual.

Contributing factors

- The departure was conducted on a dark night and the pilot did not have a suitable level of instrument flying proficiency for those conditions.
- During the climb after take-off, the pilot probably became spatially disorientated from a lack of external visual cues, leading to a loss of control and impact with terrain.

Other findings

- The aircraft's emergency locator transmitter did not provide precise accident site location information because it did not have global position system capability.
- No mechanical defect was identified with the aircraft or its systems that may have contributed to the accident.

General details

Occurrence details

Date and time:	25 March 2013 – 0518 EST	
Occurrence category:	Accident	
Primary occurrence type:	Loss of control	
Location:	2 km north-west of Roma Airport, Queensland	
	Latitude: 26° 31.82' S	Longitude: 148° 45.78' E

Aircraft details

Manufacturer and model:	Cessna Aircraft Company T210N	
Registration:	VH-MEQ	
Serial number:	21064869	
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 witnesses
- a specialist medical report.

References

Newman, D. 2007 *An overview of spatial disorientation as a factor in Aviation accidents and incidents*. ATSB investigation report B2007/0063

Previc, FH & Ercoline, WR 2004, Spatial disorientation in aviation: Historical background, concepts and terminology, in FH Previc & WR Ercoline (Eds.) *Spatial disorientation in aviation*, Lexington MA, American Institute of Aeronautics and Astronautics, Inc, pp. 1-36.

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 the pilot's next of kin and the Civil Aviation Safety Authority.

No submissions were received from those parties.

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 safety factors related to the transport safety matter being investigated. The terms the ATSB uses to refer to key safety and risk concepts are set out in the next section: Terminology Used in this Report.

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
Aviation Occurrence Investigation

VFR flight into dark night conditions and loss of control involving Cessna T210N, VH-MEQ, 2 km north-west of Roma Airport, Queensland on 25 March 2013

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