



Australian Government

Australian Transport Safety Bureau

VFR into IMC involving a Piper PA-28R, VH-TBB

100 km S of Warwick, Queensland, 21 February 2014

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Addendum

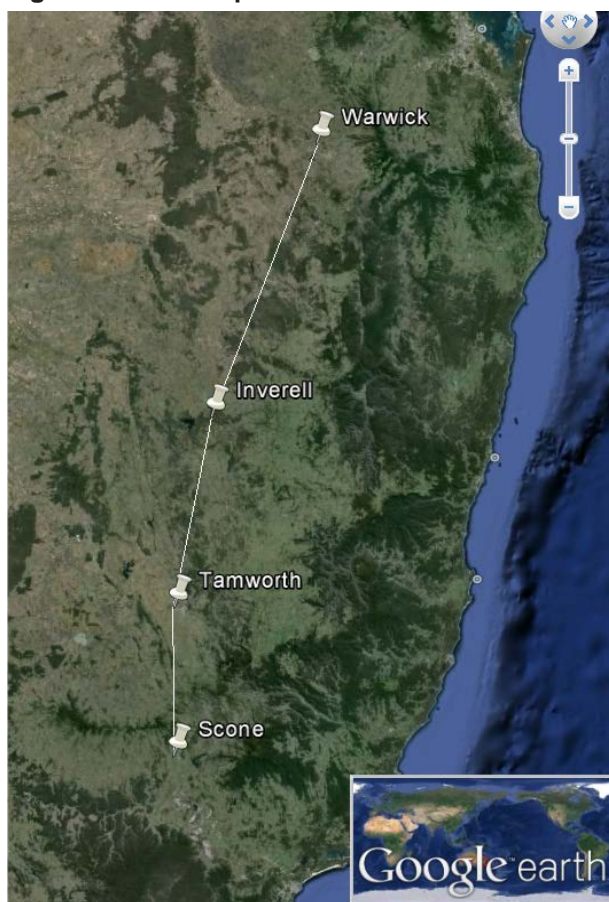
Page	Change	Date

VFR into IMC involving a PA-28R, VH-TBB

What happened

On 21 February 2014, the pilot of a Piper PA-28R aircraft, registered VH-TBB, departed Scone, New South Wales on a private flight to Warwick, Queensland. The flight was planned under the visual flight rules (VFR). The planned route took the aircraft overhead Tamworth and Inverell, then on to Warwick (Figure 1). The pilot was familiar with the route, having flown it many times before.

Figure 1: VH-TBB planned route



Source: Google earth

The pilot checked the relevant weather forecasts earlier in the day while planning the flight, including a review of the area forecasts and the aerodrome forecasts (TAF)¹ for en-route aerodromes.² In broad terms, the area forecasts indicated that some cloud might affect the flight, and that isolated afternoon thunderstorms might be encountered over the northern half of the route. The Tamworth TAF indicated that CAVOK³ conditions could be expected, but the TAF for

¹ Aerodrome forecasts are a statement of meteorological conditions expected for a specific period of time, in airspace within a radius of 5 NM (9 km) of the aerodrome.

² No TAF was available for the destination aerodrome (Warwick).

³ CAVOK means ceiling and visibility OK – the visibility, cloud and weather are better than prescribed conditions. In the context of a TAF, this means that the visibility is forecast to be 10 km or more, no significant cloud is forecast below 5,000 ft, no cumulonimbus or towering cumulus cloud is forecast at any height, and no other significant weather is forecast within 9 km of the aerodrome.

Inverell included broken⁴ cloud with a base at 2,000 ft above the airport. The TAF for Inverell also included a 30% probability of TEMPO⁵ periods of thunderstorm activity, commencing at 1200 Eastern Daylight-saving Time (EDT). The pilot initially planned to depart Scone at 1400, but, noting the forecast possibility of afternoon thunderstorms near Inverell, he elected to depart Scone around midday.

The flight passed over Tamworth and Inverell in clear conditions, but en-route between Inverell and Warwick the pilot encountered an increasing amount of cloud and light rain showers. The pilot initially attempted to pass beneath the cloud, but had difficulty remaining in visual meteorological conditions (VMC).⁶ Although the cloud appeared to be relatively light with ill-defined edges, the pilot soon found that, while the ground beneath was visible, forward visibility was restricted.

The pilot had established a flight-following service⁷ with air traffic control (ATC), but radar coverage was intermittent as the flight proceeded north. At 1329, the aircraft was identified on radar north of Inverell, and at that time was maintaining 5,500 ft.

Soon after, at about 1333, ATC advised the pilot that the relevant grid lowest safe altitude⁸ was 6,300 ft, lowering to 5,800 ft further north.⁹ The pilot responded that he was aware of his position and that he was climbing back to 5,500 ft.

A few minutes later, the pilot advised ATC that he was in instrument meteorological conditions (IMC),¹⁰ adding that he was 'OK' and that he was maintaining 5,500 ft. ATC advised the pilot that there was no reported instrument flight rules (IFR) traffic if he wished to climb further, but the pilot elected to remain at 5,500 ft, reporting that he was 'in and out of IMC' at that altitude.

At 1340, ATC asked the pilot if he wished to change from a VFR to an IFR flight, but the pilot replied that he was not qualified to conduct an IFR flight. ATC then offered the pilot assistance in finding an area suitable for continued VFR flight. The pilot did not respond to the offer of assistance, instead advising that he intended to descend to 5,000 ft in view of what appeared to be better conditions at that altitude. ATC advised the pilot that there was no reported IFR traffic affecting descent. Concerned about the circumstances surrounding the flight's progress, ATC initiated an alert phase (ALERFA).¹¹ At 1344, ATC asked the pilot about in-flight conditions. The pilot responded that he was continuing to intermittently encounter IMC and advised that he was now maintaining 5,000 ft.

Shortly after, ATC asked the pilot if he could see Tenterfield or Stanthorpe, to which the pilot responded that Tenterfield was to the east, and that he was 45 NM south of Warwick. ATC suggested that the pilot consider landing at Tenterfield, if he thought it was possible to reach Tenterfield in VMC, or that he climb above the lowest safe altitude (which at that point was 5,800 ft), if the pilot was 'comfortable to proceed IFR'. The pilot responded that he was

⁴ Cloud cover is normally forecast using expressions that denote the forecast extent of the cover. The expression 'broken' indicates that more than half to almost all the sky was forecast to be covered.

⁵ TEMPO indicates a temporary deterioration in the forecast weather conditions, during which significant variation in the prevailing conditions is expected to last for periods of between 30 and 60 minutes in each instance.

⁶ VMC describes weather conditions in which flight under the VFR is permitted – that is, conditions in which the pilot has sufficient visibility to fly the aircraft maintaining visual separation from terrain and other aircraft.

⁷ Flight-following involves the provision of ongoing surveillance information to VFR flights in specific classes of airspace, and under specific conditions. The service is intended to assist pilot situation awareness.

⁸ The grid lowest safe altitude is published on some Aircservices Australia charts. More information regarding grid lowest safe altitudes is provided in *Aeronautical Information Publication (AIP) Australia*.

⁹ The ATSB did not review Aircservices Australia radar data during investigation into this incident. An analysis of other data indicated that the aircraft was about one-third of the way between Inverell and Warwick when ATC advised the pilot of the relevant grid lowest altitude. Radio transcripts obtained by the ATSB did not indicate what prompted ATC to advise to the pilot of the grid lowest safe altitude.

¹⁰ IMC describes weather conditions that require pilots to fly primarily by reference to instruments, and therefore under the instrument flight rules (IFR), rather than by outside visual references. Typically, this means flying in cloud or limited visibility.

¹¹ ATC initiate an ALERFA when among other things, apprehension exists as to the safety of the aircraft and its occupants, or an aircraft is operating in IMC when it should not.

‘comfortable to proceed IFR’, that continued VFR flight ‘towards Stanthorpe’ did not appear possible, and that he was now climbing to 5,800 ft. The pilot then informed ATC that visual contact with terrain was possible ‘90% of the time’, adding ‘everything’s OK’. Soon after, having lost radar identification, ATC asked the pilot about his current level and intentions, to which the pilot responded that he was passing 5,500 ft, climbing to 5,800 ft.

At 1349, ATC advised the pilot to remain in VMC if possible, to which the pilot responded that it would be necessary to descend again to maintain VMC. About 2 minutes later, the pilot reported that he was maintaining 5,200 ft in VMC. Soon after, when about 30 NM south of Warwick, the pilot reported that conditions ahead were clear. The aircraft continued to Warwick and landed without further incident.

Pilot comments

The pilot provided the following comments regarding the incident:

- With the benefit of hindsight, it would have been prudent to turn back when the extent of cloud north of Inverell became apparent.
- The weather did not initially appear to be particularly threatening – the cloud was relatively light with ill-defined edges and the conditions were smooth. This provided him with some confidence that descent beneath the cloud would allow him to continue safely towards Warwick. However, he soon found out that the aircraft was in a position where turning back may have been equally as difficult as continuing towards Warwick.
- During the encounter with marginal conditions, the total time in cloud was about a minute.
- He had undertaken some IFR training about 2 years prior to this incident. This training had provided a level of confidence with respect to maintaining aircraft control in less than VMC.
- The aircraft was equipped with a three-axis auto-pilot, which the pilot used during his encounter with marginal conditions.

ATSB comment – ATC support

While weather-related decision making was the responsibility of the pilot, he availed himself of ATC advice and support to help deal with the circumstances by requesting flight-following services and advising ATC of the prevailing conditions. During this incident, ATC was able to relay information regarding lowest safe altitudes and possible diversion aerodromes, and keep the pilot informed with respect to any known and possibly conflicting air traffic. Under some circumstances, ATC may also be able to assist pilot situation awareness by providing advice with respect to weather conditions in the area and on the planned route.

Safety message

Pilots are encouraged to make conservative decisions when considering how forecast weather may affect their flight. If poor weather is encountered en-route, timely and conservative decision making may be critical to a safe outcome. VFR pilots are also encouraged to familiarise themselves with VMC criteria detailed in *Aeronautical Information Publication (AIP) Australia*, and carefully consider available options where forecast or actual conditions are such that continued flight in VMC cannot be assured.

The ATSB SafetyWatch highlights the broad safety concerns identified in investigation findings and from the occurrence data reported to the ATSB by industry. One safety concern relates to general aviation pilots who fly into conditions of reduced visibility, without the appropriate training, skills and qualifications. The two main risks associated with flight into conditions of reduced visibility are: a loss of orientation, leading to loss of control and uncontrolled flight into terrain; and if the pilot is able to maintain control, the pilot may be unable to see and avoid obstacles,



leading to controlled flight into terrain. Refer to the ATSB website at www.atsb.gov.au/safetywatch/ga-pilots.aspx.

The ATSB recently published *Avoidable Accidents No. 4 – Accidents involving Visual Flight Rules pilots in Instrument Meteorological Conditions* (www.atsb.gov.au/publications/2011/avoidable-4-ar-2011-050.aspx). A key message outlined in the report is:

Pressing on in to IMC conditions with no instrument rating carries a significant risk of severe spatial disorientation due to powerful and misleading orientation sensations in the absence of visual cues. Disorientation can affect any pilot, no matter what their level of experience.

Numerous ATSB accident investigations and research data clearly illustrates the hazardous nature of continued VFR flight in conditions of reduced visibility. A 2005 ATSB investigation research report compared different general aviation pilot weather-related decision making behaviours. This report reinforces the significant dangers associated with VFR flight into IMC. A copy of the report is available on the ATSB website at www.atsb.gov.au/publications/2005/pilot_behaviours_adverse_weather.aspx.

General details

Occurrence details

Date and time:	21 February 2014 – 1342 EDT	
Occurrence category:	Incident	
Primary occurrence type:	VFR into IMC	
Location:	100 km S of Warwick, Queensland	
	Latitude: 28° 59.52' S	Longitude: 151° 34.62' E

Aircraft details

Manufacturer and model:	Piper Aircraft Corporation PA-28R-201	
Registration:	VH-TBB	
Serial number:	28R-7737153	
Type of operation:	Private	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	None	

About the ATSB

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; and 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.

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.

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.

About this report

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, a limited-scope, fact-gathering investigation was conducted in order to produce a short summary report, and allow for greater industry awareness of potential safety issues and possible safety actions.