Australian Government
Australian Transport Safety Bureau

Fuel Starvation involving PA-34-200, VH-BTW

19 km south of Nowra Aerodrome, 31 August 2012

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Fuel starvation involving Piper Seneca, VH-BTW

AO-2012-112

What happened

On 31 August 2012, at about 1230 Eastern Standard Time[1], a Piper PA-34-200 (Seneca) aircraft, registered VH-BTW (BTW), departed Hobart Airport, Tasmania for Bankstown Airport New South Wales on a private flight under the IFR[2]. The pilot was the only person on board.

VH-BTW

Source: Aircraft owner

While cruising at 9,000 ft above mean sea level (AMSL) and 19 km south of Nowra, New South Wales, the pilot heard a bang and the left engine stopped and then the right engine stopped shortly after. The pilot immediately feathered the propellers, declared a PAN[3] and started looking for a suitable landing area. The pilot then proceeded through the memory items on the emergency checklist. While performing the emergency checklist, the pilot discovered that the right fuel selector was in the cross-feed position and the left fuel tank had run out of fuel. The pilot repositioned the fuel selectors and restarted both engines.

At the time of the engine restart, BTW had descended to 4000 ft AMSL. The pilot advised air traffic control that both engines were now running and that he would continue to Bankstown as planned.

During the landing roll on runway 29C at Bankstown, the aircraft departed the runway, travelling approximately 80 metres along the grass runway edge before the pilot was able to regain control. The pilot was able to continue taxiing to the parking area without further incident. The aircraft was not damaged and the pilot was uninjured.

Weather Bankstown

A SPECI[4] was issued during the time of BTW's arrival at Bankstown indicating that the wind was 190 degrees at 19 kts gusting 34 kts. The cloud was scattered[5] at 900 ft above ground level.

Fuel system

The fuel system for this aircraft consisted of two tanks, one in each wing, that were interconnected. The fuel system had two fuel selectors (Figure 3), one for each engine, which were identified as LEFT ENGINE and RIGHT ENGINE. Each selector had three positions. The forward position (ON) allowed each tank to feed its respective engine. The central position (OFF)

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

[2] Instrument flight rules permit an aircraft to operate in instrument meteorological conditions (IMC), which have much lower weather minimums than visual flight rules. Procedures and training are significantly more complex as a pilot must demonstrate competency in IMC conditions, while controlling the aircraft solely by reference to instruments. IFR-capable aircraft have greater equipment and maintenance requirements.

[3] An internationally recognised radio call announcing an urgency condition which concerns the safety of an aircraft or its occupants but where the flight crew does not require immediate assistance.

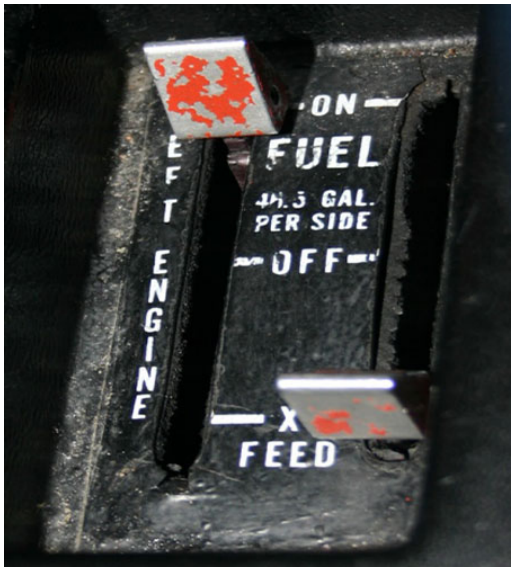
[4] SPECI is used to identify special observations; ie, observations when conditions are below specified criteria, or when there have been significant changes since the previous report. SPECI is also used to identify observations reported 10 minutes following an improvement to above SPECI conditions.

[5] Scattered indicates that cloud was covering between a quarter and a half of the sky.

cut off the fuel supply. The rear position (XFEED) was for cross-feeding fuel to an engine from the opposite side tank. For example, if the right fuel selector was on XFEED, the right engine would receive fuel from the left fuel tank.

According to the pilot's checklist, the fuel selector operation was to be checked while the aircraft was taxiing. The pilot was to set one of the selectors to OFF. When the corresponding engine started to sputter, the selector was to be set to XFEED. When the engine resumed operation the selector was to be set to ON. The selector for the other engine was then to be checked in the same manner. The checklist provided four additional opportunities to ensure that both fuel selectors were set to ON: during the engine run up, during the pre-takeoff check, when the aircraft was lined up on the runway, and when the aircraft was established at cruising altitude.

Figure 3: Fuel Selector



Source: ***Copyright TSB***

Pilot information and comments

At the time of the incident, the pilot held a Private Licence (Aeroplane) and a Private Instrument rating with about 2,000 hours total time and 1,000 hours on type.

The pilot stated his wife normally assisted on the flight, by holding the checklist and reading out the items; on this flight however, his wife was not with him. In addition, shortly after take-off he relocated his flight bag from the middle row of passenger seats to the front passenger seat. The pilot considered that it was possible that while moving the flight bag he may have dragged it across the fuel selector which is located between the front seats. The pilot also considered it possible that the fuel selector for the right engine was not returned to the ON position, after the performance of the pre-taxi checks at Hobart.

The pilot stated that he did not pay close attention to the fuel gauges in flight and did not realise that the left tank was being depleted rapidly while the right tank remained full. As the autopilot was on, the pilot could not feel the lateral imbalance caused by the difference in the quantities of fuel in each tank.

The pilot stated that following the engine failure, he disengaged the autopilot and hand flew BTW to Bankstown. However he did not comprehend the magnitude of the imbalance due to the prevailing turbulence. Consequently, he did not have an appreciation of the effect the cross wind and lateral imbalance would have on the controllability of the aircraft during the landing roll.

Safety message

Forty-four per cent of all accidents and over half of fatal accidents between 1999 and 2008 were attributed to private operations. These figures far surpassed the proportions for any other flying category, even though private operations contributed to less than 15 per cent of the hours flown in that decade[6].

Checklists are the most readily available means of risk management against errors and omissions. Pilots are reminded to be diligent in the performance of checklist items during all stages of flight as they are there to capture errors made before and during flight.

For further reading of a similar accident involving a PA-32 aircraft that occurred in Canada please see:

- Transportation Safety Board - Aviation Investigation Report A09Q0181
  www.tsb.gc.ca/eng/rapports-reports/aviation/2009/a09q0181/a09q0181.asp

Aircraft details

Manufacturer and model:	Piper Seneca - PA 34-200	
Operator:	Private	
Registration:	VH - BTW	
Type of operation:	Private	
Location:	19 km south of Nowra, New South Wales	
Occurrence type:	Fuel starvation	
Persons on board:	Crew – 1	Passengers – 0
Injuries:	Crew – 0	Passengers – 0
Damage:	Nil	

[6] ATSB, AR-2008-045 - Improving the odds: Trends in fatal and non-fatal accidents in private flying operations. Available at www.atsb.gov.au/publications/2008/ar2008045.aspx

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The Bureau 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.