Australian Government
Australian Transport Safety Bureau

Publication Date: February 2009 ISBN 978-1-921602-15-3

INFRA - 08401

Australian Transport Safety Bureau
PO Box 967, Civic Square ACT 2608
Australia
1800 020 616
www.atsb.gov.au

Released in accordance with section 25 of the *Transport Safety Investigation Act 2003*

ATSB TRANSPORT SAFETY REPORT
Aviation Occurrence Investigation AO-2007-039
Final

Smoke Event
21NM West of Mildura
27 August 2007
VH-SGA
Piper Navajo PA-31P

Abstract

On 27 August 2007, a Piper PA-31P Navajo aircraft, registered VH-SGA, with a pilot and a survey equipment operator on board, was being operated on an aerial survey 21 NM west of Mildura, NSW. At 5,000 ft altitude and operating under the visual flight rules, the pilot noticed an electrical burning smell, which was confirmed by the survey equipment operator.

The pilot, although affected by the fumes, was able to conduct a successful landing at Mildura aerodrome and reported to Air Traffic Services when safely on the ground. The aircraft was examined by a Licensed Aircraft Maintenance Engineer at Mildura. The right engine alternator 'inoperative' sensor was replaced.

As a result of this occurrence, the aircraft operator initiated safety actions to prevent a recurrence.

FACTUAL INFORMATION

The information presented below, including any analysis of that information, was prepared principally from information supplied to the Bureau.

On 27 August 2007, at 1130 Eastern Standard Time[1], a Piper PA-31P Navajo aircraft, registered VH-SGA, with a pilot and a survey equipment operator on board, was conducting an aerial survey under the visual flight rules, 21 NM west of Mildura NSW. At 5,000 ft altitude, the pilot noticed an electrical burning smell, which was confirmed by the survey equipment operator.

Smoke was observed to be emanating from the overhead panel and the pilot contacted Melbourne Air Traffic Services (ATS) and reported a cabin fire. Melbourne ATS declared a distress phase and the pilot initiated emergency procedures. He switched the appropriate master electrical switch off and did not find any electrical system circuit breakers tripped.

The survey equipment operator switched off the survey equipment to reduce the load on the aircraft electrical system and accessed a fire extinguisher.

The smoke ceased when the master switch was turned off, however, the pilot was affected by the

1 The 24-hour clock is used in this report to describe the local time of day, Eastern Standard Time (EST), as particular events occurred. EST was Coordinated Universal Time (UTC) +10 hours.

fumes and smoke. The survey equipment operator reported that he was not as affected as the hatch for the survey equipment allowed some venting at his station.

The pilot engaged the master electrical switch periodically to broadcast relevant transmissions to ATS and to operate the aircraft flaps and landing gear.

No emergency oxygen was available to the pilot. The oxygen mask that was normally fitted to the aircraft was not fitted for the incident flight as the flight was to be conducted below 10,000 ft. The survey equipment operator reported that emergency oxygen equipment was available in the rear cabin. However, he was not familiar with the operation of this equipment and had not been briefed on its use.

Following the occurrence, the pilot reported not being able to remember descending from 5,000 ft to 2,000 ft. However, the survey equipment operator reported that the pilot appeared to be making all the appropriate radio transmissions and landed the aircraft competently.

The pilot was examined by attending ambulance officers after complaining of chest pain and coughing. He was transported to Mildura hospital, where he was kept under observation for 4 hours before release. The survey operator was not as affected by the smoke and fumes, however he was examined by ambulance officers and released.

Aircraft Maintenance

The aircraft was examined by a maintenance engineer at Mildura, who found the right engine alternator 'inoperative' sensor, located in the overhead panel, was damaged as a result of an internal fault, splitting the epoxy encasement and resulting in smoke and fumes being emitted into the aircraft cabin. The right engine alternator was also examined and the alternator output cable connection was found to be loose at the alternator, resulting in the terminal connector melting, leading to separation of the cable.

The auxiliary output from the alternator, which supplied power to the alternator 'inoperative' sensor, was found to have a blown 5 A fuse, located at the rear of the alternator.

The right engine alternator, 'inoperative' sensor was replaced and the damaged alternator cable repaired and the aircraft was returned to service.

ANALYSIS

The smoke and fumes in the aircraft were a result of a component failure within the right engine alternator 'inoperative' sensor. The investigation was unable to determine the failure mode of the sensor; however, it is possible that either the loose alternator cable had induced voltage spikes into the electrical system, or an over-voltage condition may have existed due to an increased voltage at the alternator auxiliary output, contributing to the component failure.

FINDINGS

From the evidence available, the following findings are made with respect to the smoke event involving Piper PA-31P Navajo aircraft, registered VH-SGA, and should not be read as apportioning blame or liability to any particular organisation or individual.

Contributing safety factors

- Failure of the right engine 'inoperative' sensor led to smoke in the aircraft.
- The pilot was affected by the smoke and required medical attention.

Other safety factors

- The aircraft was not fitted with a pilot's oxygen mask. *[Safety issue]*
- The survey equipment operator was not familiar with the operation of the emergency oxygen equipment.
- A pre-flight safety briefing was not conducted.

SAFETY ACTION

The safety issues identified during this investigation are listed in the Findings and Safety Actions sections of this report. The Australian Transport Safety Bureau (ATSB) expects that all safety issues identified by the investigation should be addressed by the relevant organisation(s). In addressing those issues, the ATSB prefers to encourage relevant organisation(s) to proactively initiate safety action, rather than to issue formal

safety recommendations or safety advisory notices.

All of the responsible organisations for the safety issues identified during this investigation were given a draft report and invited to provide submissions. As part of that process, each organisation was asked to communicate what safety actions, if any, they had carried out or were planning to carry out in relation to each safety issue relevant to their organisation.

Operator

Fitment of oxygen masks

Safety Issue

The aircraft was not fitted with a pilot's oxygen mask.

Action taken bythe operator

As a result of this occurrence, the aircraft operator has advised the Australian Transport Safety Bureau that it has taken the following safety action:

> Pilots are required to ensure that they carry the pilot's emergency oxygen mask at all times, regardless of the expected aircraft operating altitude.

The operator has also advised the ATSB that it now requires that:

> Pilots are to ensure that emergency briefings are conducted before each flight.

SOURCES AND SUBMISSIONS

SOURCES OF INFORMATION

Information was provided to the investigation by:

- the flight crew of VH-SGA
- the aircraft operator

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

A draft of this report was provided to the aircraft operator. No submissions were received.