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ATSB TRANSPORT SAFETY INVESTIGATION REPORT
Aviation Occurrence Report – 200604475
Final

Fumes event – 55 km south-east of Jandakot, WA
04 August 2006
VH-VWO
Pilatus Aircraft Ltd PC 12/45

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Fumes event, 55 km south-east of Jandakot, WA - 04 August 2006, VH-VWO, Pilatus Aircraft Ltd PC 12/45

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Abstract

Shortly after departing Jandakot, WA the flight nurse advised the pilot that she had detected a burning odour in the aircraft's cabin. The pilot also noticed the odour a short time later. There was no smoke and no visible sign of fire. Due to the unidentified nature of the odour, the pilot initiated a diversion back to the departure aerodrome and donned his emergency oxygen equipment. The pilot also turned the under floor auxiliary heating system OFF.

Early during the diversion to Jandakot, the flight nurse reported to the pilot that the odour seemed to have dissipated. The flight landed safely at Jandakot with no further report of any fumes in the cabin.

A maintenance investigation by the operator was unable to positively identify the source of the burning odour, or indication of burning.

The cessation of the burning odour shortly after the pilot turned the under floor auxiliary heating system OFF could have been consistent with an amount of accumulated dust deposit dislodging from the heater supply duct for the passenger compartment's auxiliary heating system and coming into contact with its heating element.

The decision by the pilot to immediately don his oxygen mask minimised his exposure to any fumes that might have been associated with the burning odour. That action minimised the risk of any potential toxic or incapacitating effect on the pilot's subsequent performance.

THE AUSTRALIAN TRANSPORT SAFETY BUREAU

The Australian Transport Safety Bureau (ATSB) is an operationally independent multi-modal Bureau within the Australian Government Department of Transport and Regional Services. 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. Accordingly, the ATSB also conducts investigations and studies of the transport system to identify underlying factors and trends that have the potential to adversely affect safety.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and, where applicable, relevant international agreements. The object of a safety investigation is to determine the circumstances in order to prevent other similar events. The results of these determinations form the basis for safety action, including recommendations where necessary. As with equivalent overseas organisations, the ATSB has no power to implement its recommendations.

It is not the object of an investigation to determine blame or liability. However, it should be recognised that an investigation report must include factual material of sufficient weight to support the analysis and findings. That material will at times contain information reflecting on the performance of individuals and organisations, and how their actions may have contributed to the outcomes of the matter under investigation. 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.

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. While the Bureau issues recommendations to regulatory authorities, industry, or other agencies in order to address safety issues, its preference is for organisations to make safety enhancements during the course of an investigation. The Bureau prefers to report positive safety action in its final reports rather than making formal recommendations. Recommendations may be issued in conjunction with ATSB reports or independently. A safety issue may lead to a number of similar recommendations, each issued to a different agency.

The ATSB does not have the resources to carry out a full cost-benefit analysis of each safety recommendation. The cost of a recommendation must be balanced against its benefits to safety, and transport safety involves the whole community. Such analysis is a matter for the body to which the recommendation is addressed (for example, the relevant regulatory authority in aviation, marine or rail in consultation with the industry).

FACTUAL INFORMATION

On 04 August 2006, at about 1110 Western Standard Time[1], a Pilatus Aircraft Ltd PC-12/45 aircraft, registered VH-VWO, was being operated on a positioning flight from Jandakot to Albany, WA, to conduct a routine retrieval of a medical patient back to Jandakot. On board the aircraft were the pilot, one flight nurse and two police officers.

The pilot recalled that the aircraft was approximately 30 NM south-east of Jandakot on climb, passing flight level 225, when the flight nurse advised that she had detected a burning odour in the cabin of the aircraft. The pilot detected the odour soon after. There was no smoke and no visible sign of fire. Due to the unidentified nature of the odour, the pilot initiated a diversion back to Jandakot and immediately donned his emergency oxygen equipment. The pilot reported that, shortly after, he turned the under floor auxiliary heating system OFF.

Early during the diversion to Jandakot, the flight nurse reported to the pilot that the odour seemed to have dissipated. The flight landed safely at Jandakot with no further report of any odour in the cabin.

A maintenance investigation that was conducted by the operator was unable to positively identify any source for the reported odour, or indication of burning. An examination by the operator of the fabric condenser in the aircraft's temperature conditioning system water separator bag did not reveal any contamination.

An auxiliary heating system provides heated air to the aircraft's cabin and underfloor area in cold ambient temperatures. That system includes two electric heaters situated under the cabin floor, each comprising a heating element and a fan.

The aircraft manufacturer reported that, when the aircraft is operated in dusty conditions, dust can accumulate in the supply duct to the passenger compartment's auxiliary heating system. The intake for that duct is located next to the aircraft's cargo door. There is the potential for any accumulated dust deposits to occasionally dislodge from the ducting and come into contact with an operating heater element.

1 The 24-hour clock is used in this report to describe the local time of day, Western Standard Time (WST) as particular events occurred. Western Standard Time was Coordinated Universal Time (UTC) + 8 hours.

ANALYSIS

The source of the burning odour could not be positively identified. However, the dissipation of the burning odour shortly after the pilot turned the under floor auxiliary heating system OFF, could have been consistent with an amount of accumulated dust deposit dislodging from the supply duct and coming into contact with the heating element of the passenger compartment auxiliary heater.

The decision by the pilot to immediately don his oxygen mask minimised his exposure to any fumes that might have been associated with the burning odour. That action minimised the risk of any potential toxic or incapacitating effect on the pilot's subsequent performance.