Australian Government
Australian Transport Safety Bureau

Pilot incapacitation event involving a Hawker B200, VH-FDT

70 km NNW of Brisbane, Queensland, 5 November 2012

ATSB Transport Safety Report
Aviation Occurrence Investigation
AO-2012-147
Final – 23 April 2013

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

Publishing information

Published by: Australian Transport Safety Bureau
Postal address: PO Box 967, Civic Square ACT 2608
Office: 62 Northbourne Avenue Canberra, Australian Capital Territory 2601
Telephone: 1800 020 616, from overseas +61 2 6257 4150 (24 hours)
Accident and incident notification: 1800 011 034 (24 hours)
Facsimile: 02 6247 3117, from overseas +61 2 6247 3117
Email: atsbinfo@atsb.gov.au
Internet: www.atsb.gov.au

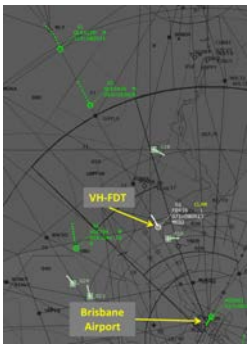
Pilot incapacitation event involving a Hawker B200, VH-FDT

What happened

The information presented below was prepared from information supplied to the ATSB by the operator, the flight nurse, and Airservices Australia.

On 5 November 2012, at about 1530 Eastern Standard Time[1], a Hawker B200 aircraft, registered VH-FDT (FDT), departed Bundaberg on an aeromedical retrieval flight to Brisbane, Queensland. On board the aircraft were the pilot, the flight nurse and two patients.

Aircraft position at 1607



Source: Airservices Australia

At 1538, the pilot advised Brisbane Centre air traffic control (ATC) that they were maintaining flight level (FL)[2] 170.

Prior to, and during the flight, the nurse had reported feeling nauseous. Consequently, the pilot advised the nurse that they may experience turbulence during the descent. The nurse briefed the patients accordingly and returned to her seat, directly behind the pilot facing backwards, and secured her seat belt. The nurse then turned her very high frequency (VHF) radio off as the constant communications were contributing to her feeling nauseous.

At 1543, the pilot received a clearance from Brisbane Centre to descend to 8,000 ft when ready; the pilot read back the clearance. With the autopilot engaged, the pilot selected 8,000 ft on the aircraft's altitude selector and activated the vertical navigation (VNAV) mode[3].

In preparation for the commencement of the MALENY EIGHT standard arrival route (STAR), the pilot reported also selecting an engine power setting of about 950 foot pounds of torque (ft/lb Tq) per engine.

At 1547, the pilot advised Brisbane Centre that he had commenced descent.

At 1556, Brisbane Centre instructed the pilot to contact Brisbane Approach. No response from the pilot was received. At that time, the aircraft was observed on Airservices Australia surveillance data descending through FL118 (Figure 1).

Between 1556 and 1607, Brisbane Centre and Brisbane Approach attempted to contact FDT on 22 occasions, while two aircraft operating in the area also attempted to contact FDT, with no response received.

At 1601, the aircraft was observed levelling off at 8,100 ft.

At 1604, the aircraft was observed maintaining 8,100 ft when passing the instrument flight rules (IFR) waypoint of 'BURPA', which had a requirement to cross at or below 6,000 ft.

As the flight continued, the nurse became concerned as she had not yet sighted the geographic features she normally observed. The nurse then turned her VHF radio on and heard a number of broadcasts from various persons attempting to contact FDT. The nurse turned towards the pilot and observed that his chin was slumped onto his chest and he was not alert.

---

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

2 At altitudes above 10,000 ft in Australia, an aircraft's height above mean sea level is referred to as a flight level (FL). FL 170 equates to 17,000 ft.

3 The VNAV mode maintains a constant descent profile to an assigned altitude entered by the pilot. When the assigned altitude is reached, the aircraft automatically levels off.

The nurse immediately left her seat and attempted to arouse the pilot by shaking his arm. At the same time, the nurse observed the aircraft pitch upwards, coincident with the stall warning alarm activating. The pilot regained alertness and initiated recovery actions. He reported disconnecting the autopilot and applying an amount of engine power. The pilot reported climbing the aircraft to 8,300 ft, although this could not be verified by Airservices Australia surveillance data.

The nurse recalled assessing the pilot as having a Glasgow Coma Scale (GCS)[4] rating of 15/15 within 30 seconds of becoming alert. The nurse returned to her seat and continued to monitor the pilot.

At 1606, the Brisbane Approach controller observed FDT commencing a descent. Shortly after, the cleared level adherence monitoring (CLAM)[5] alarm activated, indicating the aircraft had descended below the assigned level of 8,000 ft.

At 1607, the pilot contacted Brisbane Approach and established communications (Figure 2). After a number of short transmissions between the pilot and Brisbane Approach, the pilot received ATC instructions for approach sequencing into Brisbane.

During the approach, the pilot changed to the Brisbane Tower frequency. Soon after, the nurse observed that the pilot began to hyperventilate, with an increased level of breathing and physical shaking of the hands.

Shortly after, at 1617, the aircraft landed.

The nurse recalled that the landing and subsequent taxi speed appeared faster than normal. During the taxi, the nurse reported that the pilot's emotional and physical state worsened. She encouraged the pilot to complete the after landing checklist and offered reassurance. The nurse also provided the pilot with an oxygen mask (with no oxygen supply) to simulate a 'brown paper bag'. She reported that the pilot's breathing slowed and his physical condition improved slightly.

The aircraft was taxied to the parking area and shutdown.

The nurse advised the pilot that she would organise the patient offload. She then sought assistance for the patients and the pilot. The emotional and physical state of the pilot at the time was reported as poor.

Drug and Alcohol Management Plan (DAMP) testing was conducted and the pilot was transported to hospital for further testing and observation. The DAMP test returned a positive reading for an illicit substance, which had affected the pilot's sleep cycle.

Flight nurse comments

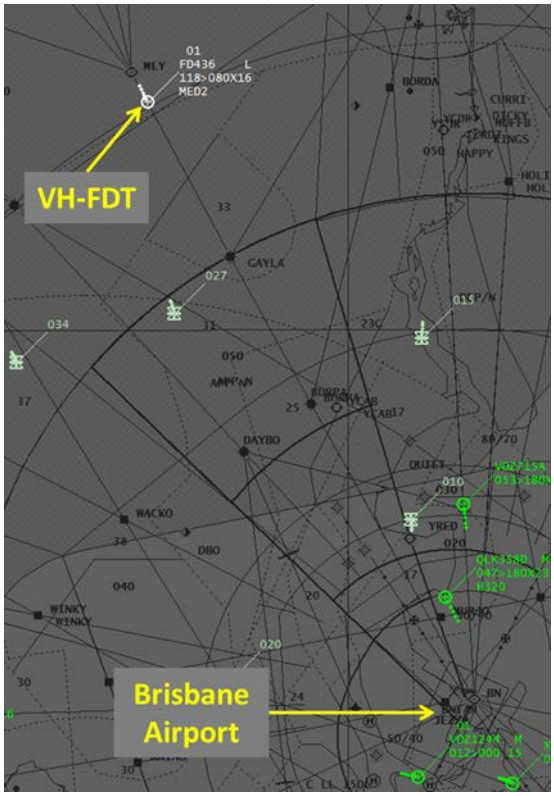
The nurse reported having flown with the pilot on a number of occasions prior to the incident flight, and that his condition and demeanour on the day was normal.

---

[4] The GCS is a neurological scale that aims to give a reliable, objective way to recording the conscious state of a person for initial as well as subsequent assessment. A patient is assessed against the criteria of the scale and the resulting points give a patient score between 3 (indicating deep unconsciousness) and either 14 (original scale) or 15 (the more widely used modified or revised scale).

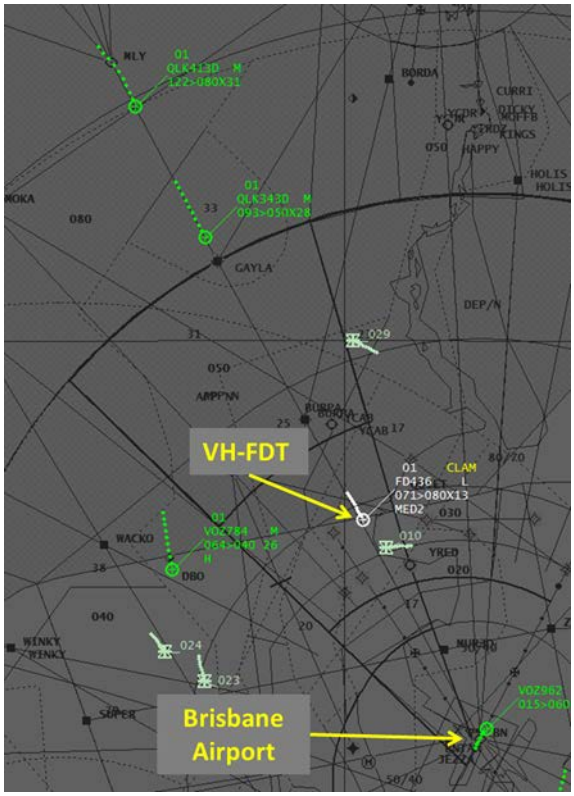
[5] The CLAM alert function monitors an aircraft's conformance with the cleared flight level and alerts the controller of any deviation from that clearance.

Figure 1: Aircraft position at 1556



Source: Airservices Australia

Figure 2: Aircraft position at 1607



Source: Airservices Australia

Cabin safety and emergency training

The operator provided cabin safety and emergency training on an annual basis, which included a specific module on pilot incapacitation for flight nurses. The training provided guidance on how to respond to a pilot incapacitation from both a medical and operational perspective. This included using the autopilot, the communications system, the flaps, landing gear and power levers.

The nurse onboard FDT had completed the training about six months prior to the incident. The nurse indicated that more practical training on using the aircraft's communication system would be beneficial. She further stated that, if she was required to use the communication system on the incident flight, it would not have been straight forward. Since the incident, the nurse has received one-on-one practical training with the operator and has been shown how to operate the communications system.

Operator investigation

The operator conducted an internal investigation into the incident and identified that:

- ***Engine power setting**:* With the autopilot engaged, the selected power setting of 950 ft/lb Tq per engine, should have maintained the aircraft level at 8,000 ft, well above the stall warning airspeed. It was likely that the setting was reduced from 950 ft/lb Tq per engine to a lower setting. This indicated that the pilot probably became incapacitated shortly after changing the power setting.
- ***Pilot fatigue**:* Since 1 November 2012, the pilot had reported significant sleep disturbances. At the time of the incident, it was determined that the pilot was experiencing a fatigue level well above that of a normal day worker when ready to retire to bed.
- ***Sustenance**:* Prior to departing Bundaberg, the pilot reported consuming a soft drink and chocolate as he was feeling 'a little low in energy'.

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

Aircraft operator

As a result of this occurrence, the aircraft operator has advised the ATSB that they are taking the following safety actions:

- ***Random drug and alcohol sample testing***: A comprehensive options paper examining the feasibility of introducing internal random sample testing is currently being prepared and will be presented to the Board in February 2013 for consideration.
- ***Illicit substance education***: Managers will be provided with training on identifying the symptoms and behavioural effects of using an illicit substance.
- ***Cabin safety and emergency training***: Reference material used in the operator's cabin safety and emergency training course regarding pilot incapaciation has been reviewed, with minor changes and additions made.
- ***'First Actions' checklist***: The checklist was developed from existing training material as a quick reference guide for nurses when responding to a pilot incapacitation event.

Safety message

Flying an aircraft is a complex, demanding and challenging activity, which requires a high level of cognitive functioning and psychomotor skills. The significant performance impairments associated with drug use are widely recognised. Consequently, the use of drugs by pilots can adversely affect their ability to safely operate an aircraft.

A Research and Analysis Report conducted by the ATSB, identified that between 1 January 1975 and 31 March 2006, there was a reported 31 accidents and five incidents related to drug and alcohol use. Of this, 14 accidents were related to the use of legal and illegal drugs. Overall, the study showed that the prevalence of drug and alcohol-related accidents and incidents in Australian civil aviation was very low, but the related accident and fatality rates were high. This report is available at www.atsb.gov.au/publications/2006/b20060169_001.aspx.

General details

Registration:	VH-FDT	
Manufacturer and model:	Hawker Beechcraft Corporation B200	
Type of operation:	Aerial work	
Occurrence category:	Serious incident	
Primary occurrence type:	Crew incapacitation	
Location:	70 km NNW of Brisbane Airport, Queensland	
	Latitude: 26° 47.93' S	Longitude: 152° 45.38' E
Persons on board:	Crew – 2	Passengers – 2
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

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.