Australian Government
Australian Transport Safety Bureau

Publication Date: 25 July 2008 ISBN 978-1-921490-57-6

ATSB TRANSPORT SAFETY INVESTIGATION REPORT
Aviation Occurrence Investigation AO-2008-026
Interim Factual Report

Collision with water – 19 km SE Sydney, NSW
9 April 2008

Australian Transport Safety Bureau
PO Box 967, Civic Square ACT 2608
Australia
1800 621 372
www.atsb.gov.au

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

July2008/Infrastructure 08209

Abstract

On 9 April 2008, a Fairchild Industries Metro III aircraft departing Sydney, NSW, was observed on radar to be turning contrary to air traffic control instructions. The pilot reported that he had a '...slight technical fault...'. Recorded radar data showed the aircraft then completed a turn to the left before turning back to the right and disappearing from radar at an altitude of 3,900 ft. Searchers later discovered a small amount of aircraft wreckage floating in the ocean, south of the last recorded radar position. The pilot was fatally injured and the aircraft was destroyed. The investigation is continuing.

FACTUAL INFORMATION

The information contained in this interim factual report is derived from initial investigation of the occurrence. Readers are cautioned that there is the possibility that new evidence may become available that alters the circumstances as depicted in the report.

On 9 April 2008 at 2316 Eastern Standard Time[1], the pilot of a Fairchild Industries Inc. SA227-AC (Metro III) aircraft, registered VH-OZA (Figure 1), taxied at Sydney, NSW, on a freight charter flight to Brisbane, Qld. The flight was operated under the Instrument Flight Rules (IFR) and the pilot was the sole occupant.

Figure 1: VH-OZA

Photograph courtesy of Brian Wilkes

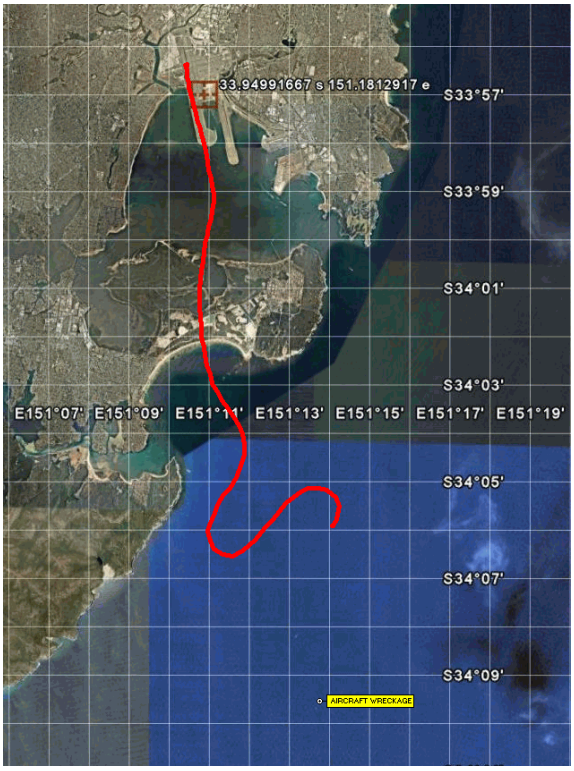
At 2321:43, the Sydney aerodrome controller had issued the pilot a take-off clearance from runway 16 Right. Airservices Australia recorded information later showed that the aircraft had become airborne at 2323:15 and shortly afterwards the pilot had been instructed to transfer to the departures controller's radio frequency.

On first radio contact with that controller, the pilot was advised that the aircraft was identified on radar. At 2325:30, the controller instructed the pilot to turn left onto a heading of 090 degrees, which was acknowledged. Instead of the expected left turn, the radar returns indicated that the aircraft was turning right, towards the south-west. At 2325:54, the controller confirmed with the pilot that he was to turn left and at 2325:59 the pilot once again acknowledged the left turn and added 'I've got a slight technical fault here'.

No further transmissions were received from the pilot. The radar returns over the next 70 seconds showed the aircraft completed a left turn followed by a right turn before disappearing from radar (Figure 2). The last recorded radar return indicated an altitude of 3,900 ft.

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

Figure 2: Radar track of aircraft on departure



Wreckage information

The subsequent search and rescue response located floating wreckage and freight believed to be from the aircraft at 0444 on 10 April 2008. This was to the south of the last recorded radar position, as shown at the bottom of Figure 2.

Preliminary examination of the recovered wreckage (Figure 3) indicated that the aircraft had impacted the water at high speed. The pilot was fatally injured and the aircraft was destroyed.

Figure 3: Recovered floating wreckage

After reviewing the available recorded data, witness reports and other known facts, the Australian Transport Safety Bureau (ATSB) investigation team commenced a search for the main wreckage, with the assistance of the New South Wales Water Police. Those initial efforts focused on locating the flight recorders (see *Flight recorders* for details) using underwater acoustic pinger locating equipment. After confirming audio signals from an acoustic pinger near the identified search area, the search area was further refined.

Under ATSB supervision, commercial operators were contracted to locate and record aircraft wreckage/components. Those operations included towed array side-scan sonar and underwater remote operated vehicles (ROV) fitted with video cameras. Poor weather conditions on the ocean surface hampered and delayed both of the commercial operations and the ATSB's earlier work locating the pinger.

The ocean depths in the search area ranged from 95 to 110 m. The depths were beyond the safe range of conventional SCUBA[2] diving operations. Subsequent operations determined that there was little natural light and the visibility on the seabed was limited.

On 12 May 2008, a significant wreckage field was identified and recorded by the ATSB investigation team. The wreckage appeared to be spread over an area approximately 1,200 m long and 400 m wide. While it was believed that the aircraft recorders were contained within this field, they were unable to be retrieved at that time.

On 24 June 2008, the ATSB investigation team was mobilised together with a salvage and recovery contractor that included ROV specialists.

The vessel contracted for the search and recovery was 76 m in length, fitted with a 3 tonne winch and was dynamic positioning (DP) capable (Figure 4). The DP capability enabled the vessel to maintain a geostationary position within 1 m using Omnistar navigation.

2 Self Contained Underwater Breathing Apparatus.

Figure 4: Deck of search and recovery vessel

On 27 June 2008, the wreckage field, together with the cockpit voice recorder (CVR) (Figure 5), was located at position 34.05.76S 151.14.12E. The CVR was recovered from a depth of 109 m on the ocean floor the following day and numerous other items of wreckage were located and photographed.

Figure 5: Cockpit voice recorder on the ocean floor at a depth of 109m displayed on the ROV monitor.

On 29 June 2008, the flight data recorder (FDR) was located and recovered together with the artificial horizon indicator. The ATSB investigation team completed work with the salvage and recovery contractor and returned to Canberra with the recorders and items of wreckage on 30 June 2008.

Flight recorders

Cockpit voice recorder

Maintenance records indicate that VH-OZA had been fitted with a Fairchild model A100A CVR, part number 93-A100-80 serial number 55650. The Fairchild model A100A CVR is capable of recording four channels of audio signals for a nominal duration of 30 minutes. The four channels comprise signals from the pilot's, co-pilot's and passenger address audio systems and a remote mounted cockpit area microphone.

Figure 6: Fairchild model A100A cockpit voice recorder from VH-OZA

The recovered Fairchild CVR had been subjected to substantial impact forces (Figure 6). Identification of the recovered recorder was not possible since a placard affixed to the recorder, indicating the unit configuration, had been damaged; obliterating the last two significant part numbers. In addition, the manufacturer's data plate was missing. The CVR was washed and inspected and the impact damage was assessed. Some discolouration of the external paint was observed. The CVR was then dismantled and the recording tape recovered. The tape was in reasonable physical condition and, after cleaning, was replayed using the Bureau's CVR replay equipment. The recovered recording on the tape contained audio signals on three channels (two flight crew positions and the area microphone) with a duration of about 30 minutes.

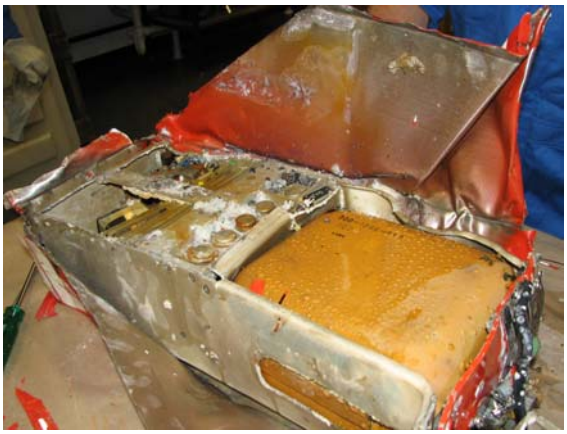
The audio indicated the aircraft, VH-OZA was being operated by a single pilot and was conducting an approach and landing to Sydney (Kingsford Smith) Airport, NSW. The recorded conversations related to the operation of the

aircraft and radio conversations with Air Traffic Control (ATC) and concluded with the aircraft being parked.

Flight data recorder

The recovered FDR was identified from the manufacturer's data plate as a Sundstrand Data Control (now Honeywell Aerospace) model Universal Flight Data Recorder, part number 980-4100-FWUS serial number 1313. Maintenance records indicate this recorder was fitted to VH-OZA at the time of the occurrence. The Honeywell FDR had been installed to record six parameters, Magnetic Heading, Airspeed, Altitude, Normal Acceleration, Microphone Keying and Elapsed Time, and is capable of recording at least 25 hours of aircraft operation in a digital format.

Figure 7: VH-OZA flight data recorder during disassembly showing crash protected enclosure and associated electronics



The FDR had been subjected to substantial impact forces, which had resulted in the fracture of the crash-protected enclosure. Some discolouration of the external paint was observed. The recorder was dismantled (Figure 7) and the recording tape was extracted for replay. The tape was in reasonable condition and, after cleaning, was replayed using the Bureau's FDR analysis workstation. The tape contained about 25 hours of good quality digital signals recorded across eight tracks. The transition from oldest to newest recorded information was confirmed by examination of all tracks.

The last flight recorded indicated VH-OZA flew from Brisbane Airport to Sydney Airport. The aircraft cruised at an altitude of 14,000 ft, made an approach and landed on runway 34 at Sydney, then taxied to the north-east and parked.

As the FDR does not record date and time, data from about the last 10 hours of operation was recovered and compared to the aircraft trip logs to ascertain when the last recorded flight occurred. The data matched the sectors noted in the trip log and it was confirmed that the last recorded flight was performed on the morning of 9 April 2008.

Correlation of CVR and FDR data

Figure 8: Plot of the last 5.5 hours of recovered FDR data

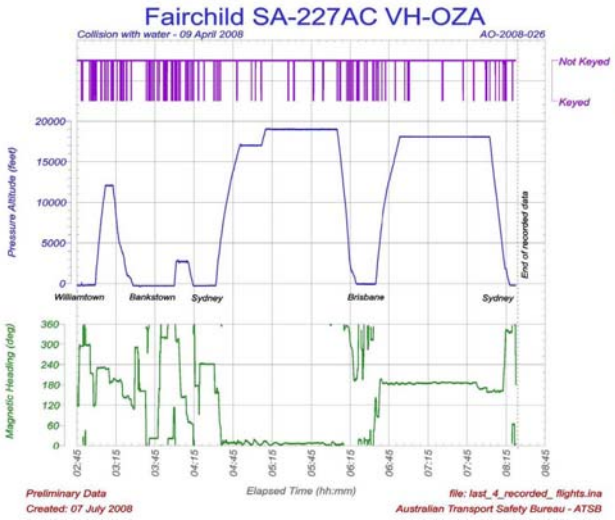


Figure 8 shows the last four sectors (about the last 5.5 hours of operation) of flight data that was recovered. The aircraft trip logs confirmed that Williamtown - Bankstown - Sydney flights were carried out on 8 April 2008. The aircraft then flew Sydney - Brisbane - Sydney on the morning of 9 April 2008.

Microphone keying recorded by the FDR was compared with the timing of radio conversation between VH-OZA and ATC recorded on the CVR. The elapsed time between conversations recorded on the CVR closely correlated with the microphone keying recorded on the FDR. In addition, conversations regarding runway and taxiway direction recorded on the CVR correlated with FDR data. It was therefore confirmed that the CVR recording was of the flight and landing at Sydney Airport on the morning of 9 April 2008 (the flight preceding the accident flight). Both the CVR and FDR recordings ended with what would seem to be a normal aircraft shutdown.

Aircraft information

The Fairchild Industries Inc. SA227-AC (Metro III) aircraft, serial number AC-600, was manufactured in 1984 in the US. It was first registered in Australia on 25 February 1998. It was powered by two Garrett TPE331-11U turboprop engines, fitted with four-bladed Dowty Rotol full-feathering propellers. The aircraft was of a tricycle, retractable landing gear design.

The aircraft was issued with a valid maintenance release on 21 February 2008. That release remained current until 21 February 2009 or 32,355.8 hrs total time in service (TTIS). On the day prior to the accident, records indicated that the aircraft had logged 32,339.5 hrs TTIS and 46,710 landings.

There were no annotated defects on the last recorded maintenance documentation available to the investigation.

The aircraft's flight recorders were fitted with water activated acoustic pingers to assist with their location when submerged.

Pilot information

The pilot held a Civil Aviation Safety Authority Air Transport Pilot (Aeroplane) Licence ATP(A)L and had a valid class 1 medical with no restrictions.

Prior to the day of the accident, the pilot's logbooks showed a total of 4,873.0 flight hours. The pilot had been endorsed on the Metro III aircraft in December 2007 and the logbooks showed a total of 175.2 hrs on type, including 113.3 hrs in the previous 90 days.

The pilot was reported to have been fit, healthy and well rested on the day of the accident flight.

Meteorological information

Meteorological information broadcast on the Sydney Airport computerised automatic terminal information system (CATIS) at the time of the accident, indicated that the wind was 230 degrees at 6 kts, visibility was greater than 10 km and the cloud was few[3] at 2,800 ft.

Further investigation

The investigation is continuing and will include:

- further analysis of flight recorder information
- investigation of possible system failure modes that would prevent both recorders from operating
- investigation of the relationship between the non-operation of both flight recorder systems and other aircraft systems during the accident flight
- investigation of the discolouration of paint on the flight recorders
- investigation of the possible loss of secondary surveillance radar (SSR) transponder signal during the accident flight
- examination of recovered wreckage
- examination of ROV video of wreckage
- examination of the wreckage pattern
- ongoing investigation of aircraft maintenance and loading documentation.

3 Cloud amounts are reported in oktas. An okta is a unit of sky area equal to one-eighth of total sky visible to the celestial horizon. Few = 1 to 2 oktas, scattered = 3 to 4 oktas, broken = 5 to 7 oktas and overcast = 8 oktas.