Australian Government
Australian Transport Safety Bureau

Loss of separation between an Airbus A320, VH-VFJ and a Bell 412, VH-VAO

Avalon Airport, Victoria, 4 July 2013

ATSB Transport Safety Report
Aviation Occurrence Investigation
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Addendum

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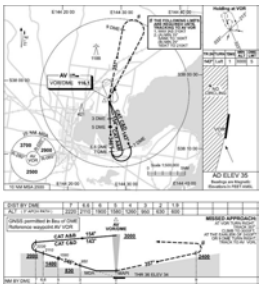
Loss of separation between an Airbus A320, VH-VFJ and a Bell 412, VH-VAO

What happened

On the evening of 4 July 2013, a Jetstar Airways Airbus A320 aircraft, registered VH-VFJ (VFJ), was conducting a very high frequency omnidirectional radio range (VOR)[1] approach to runway 36 at Avalon Airport, Victoria, under instrument flight rules (IFR).

At 2033 Eastern Standard Time,[2] as the pilot in command (PIC) of VFJ commenced the outbound leg of the approach, the pilot of a Bell 412 helicopter, registered VH-VAO (VAO), taxied at Avalon for an IFR flight to Warrnambool, Victoria.

Runway 36 VOR approach



Source: Airservices Australia

As the air traffic control tower at Avalon was closed, the airspace immediately above Avalon to a height of 700 ft and within 8 NM was classified as Class G.[3] From 700 ft to 4,500 ft the airspace was Class E,[4] and above that was Class C.[5] Air traffic services were being provided to aircraft in Classes E and G by Avalon Approach air traffic control (ATC) and air traffic services for aircraft in Class C were being provided by Melbourne Departures ATC. At the time of the incident, the same controller was responsible for both Avalon Approach and Melbourne Departures. Aircraft operating in Class G were required to make broadcasts on the common traffic advisory frequency (CTAF). Due to the airspace configuration, pilots of IFR aircraft operating into and out of Avalon were required to monitor both the Avalon CTAF and the Avalon Approach frequency. In addition, IFR aircraft departing Avalon required a tracking clearance from Avalon Approach, but Avalon Approach did not provide a take-off clearance.

When the pilot of VAO had advised ATC he was taxying, the controller requested the pilot expedite so that VAO could depart before VFJ landed. At 2035, after making all the necessary broadcasts on the CTAF and receiving a clearance from the controller to enter Class E, VAO became airborne on a northerly heading on climb to 4,000 ft. However, due to a very strong westerly wind,[6] VAO's speed and climb rate were reduced. At about the same time, VFJ was about 9 NM south of Avalon turning inbound on the VOR approach.

The controller also advised the crew of VFJ that a helicopter, VAO, had become airborne, although it was likely the crew did not hear the full transmission as it coincided with VAO's departure broadcast on the CTAF. When the crew of VFJ did not respond to the call, the controller again advised of the traffic at Avalon, again receiving no response.

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1 VOR – A ground-based navigation aid that emits a signal that can be received by appropriately-equipped aircraft and represented as the aircraft's bearing (called a 'radial') to or from that aid.

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

3 Class G – IFR and VFR flights are permitted and do not require an airways clearance. IFR flights must communicate with air traffic control and receive traffic information on other IFR flights and a flight information service. VFR flights receive a flight information service if requested.

4 Class E – IFR aircraft require an airways clearance and must communicate with air traffic control. IFR aircraft are positively separated from other IFR aircraft and given traffic information on known VFR aircraft. VFR aircraft do not require an airways clearance and are not required to communicate with air traffic control.

5 Class C – All aircraft must get an airways clearance and communicate with air traffic control. IFR aircraft are positively separated from both IFR and VFR aircraft. Visual Flight Rules (VFR) aircraft are provided traffic information on other VFR aircraft.

6 The wind was reported as about 310˚ at 35 to 50 knots.

At 2038, as the helicopter climbed through 1,900 ft, about 2 NM north of Avalon, the controller instructed the pilot of VAO to turn left onto a heading of 260˚. Due to the strong westerly wind, the helicopter's track was almost northerly.

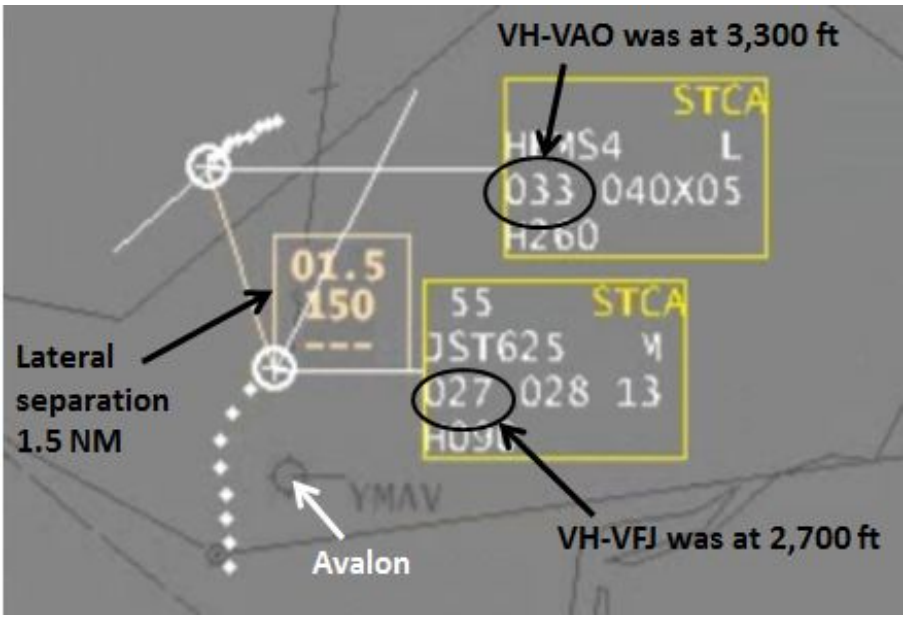
At 2039, the PIC of VFJ initiated a missed approach about 2 NM south of Avalon at 600 ft as the aircraft had become high on the descent profile, which would have resulted in an unstable approach. At that time, VAO had crossed the extended centreline of runway 36 about 2 NM north of Avalon passing 2,500 ft. The lateral separation between VAO and VFJ was 4.4 NM.

The missed approach procedure for the runway 36 VOR approach at Avalon required the PIC of VFJ to track north on climb to 3,000 ft. At 2039, as the required separation of 3 NM or 1,000 ft was about to be lost, the controller twice instructed the crew of VFJ to stop their climb but received no response.

A review of the relevant audio recordings showed that, 2 seconds after the controller's second transmission, the crew of VFJ responded, but on the CTAF, not on the Avalon Approach frequency. Ten seconds after the controller's second transmission, the crew of VFJ responded on the correct frequency, stating that they were unable to comply with an instruction to maintain 2,000 ft, but that they would maintain 2,500 ft. At that time, VAO was slightly west of the extended centreline of runway 36 passing 3,000 ft, still about 2 NM north of Avalon. Radar separation had reduced to 2.7 NM and the Short Term Conflict Alert (STCA) had activated on the controller's display.

The controller then instructed the crew of VFJ to make an immediate right turn and advised them of the location of VAO, 500 ft above and 2.3 NM ahead. As VFJ turned right, vertical separation reduced to 600 ft and lateral separation to 1.5 NM (Figure 1). The crew of VFJ continued the right turn and subsequently landed at Avalon without further incident. The pilot of VAO continued tracking west for his destination.

Figure 1: The positions of VH-VAO and VH-VFJ at 2040



Source: Airservices Australia

Avalon Approach controller comments

At the time of the incident, the controller was also responsible for airspace in relation to arrivals and departures into Melbourne Airport, requiring the controller to operate on two frequencies – Avalon Approach and Melbourne Departures. The controller had no facility to monitor the Avalon CTAF.

Shortly after clearing VAO to depart, the controller realised this compromised the missed approach path for VFJ. As soon as they became aware that the PIC of VFJ had initiated a missed approach, the controller gave tracking and level instructions to the crew of VFJ to re-establish the required separation. The controller also passed traffic on the helicopter.

The controller had completed annual compromised separation training the week prior to the incident, but reported that the training was based on generic airspace and, as the controllers undertaking the training were aware of what was about to happen in each of the training scenarios, it was not realistic. The controller reported that the training did not transfer to day-to-day operations; on the day of the incident the compromised separation was unexpected and the PIC of VFJ did not respond to his first two transmissions.[7]

Factual information provided by Airservices Australia

Airservices Australia (Airservices), the air navigation service provider for Avalon airspace, reported that, due to the proximity of the runway 36 VOR approach minima (600 ft) with Class G airspace (surface to 700 ft), aircraft are required to be given a clearance to re-enter Class E airspace with their arrival clearance. Such a clearance had not been provided to the crew of VFJ.

Further, Airservices stated that the controller had incorrectly planned and projected the traffic situation whereby there was no separation assurance between the helicopter's departure track and the aircraft's missed approach path.

Jetstar Airways investigation

An internal investigation conducted by Jetstar Airways found that the missed approach was the result of an unstable approach, partly caused by the strong westerly wind. Additionally, the investigation found:

- The initial CTAF broadcast from the pilot of VAO was indistinct and the crew of VFJ did not realise it was a helicopter.
- The instructions from the controller immediately following the initiation of the missed approach occurred during a time of high workload.
- Having left Class E airspace on the runway 36 VOR approach, the CTAF had been selected on the aircraft's radio, though the crew were still monitoring Avalon Approach. During a period of high workload, recognising the need to re-select the Avalon Approach frequency and then selecting it took about 15 seconds.
- The aircraft performance would have precluded the crew of VFJ from complying with the first two instructions from the controller.
- Though fitted with a traffic collision avoidance system (TCAS),[8] no alert was received.

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.

Jetstar Airways

As a result of this occurrence, Jetstar Airways has advised the ATSB that they are taking the following safety action:

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[7] Airservices Australian advised the ATSB that there was no evidence to suggest that the Controller did not respond appropriately to the compromised separation event or the training provided to the controller was deficient or otherwise contributed to the occurrence.

[8] TCAS is an aircraft collision avoidance system. It monitors the airspace around an aircraft for other aircraft equipped with a corresponding active transponder and gives warning of possible collision risks.

Technical Newsletter

A technical newsletter will be sent to company flight crew highlighting the incident and:

- emphasising the joint responsibility for maintaining separation assurance
- providing guidance with regard to correct controller/crew interactions, specifically in relation to a clearance to leave and re-enter controlled airspace in the event of a missed approach at CTAFs with low overlying controlled airspace
- providing guidance with regard to controller expectation of the transfer of responsibility for separation from within the CTAF (on approach) to controlled airspace (in the event of a missed approach).

Airservices Australia

As a result of this occurrence, Airservices has advised the ATSB that they are taking the following safety action:

Avalon operations and airspace design

Airservices is currently undertaking a review of the risk profile associated with Avalon operations and airspace design. Of concern are the small layers of differing airspace classes with different service levels and frequency requirements. Pending the findings of the review, Airservices may request that the Civil Aviation Safety Authority (CASA) conduct an aeronautical study of the airspace surrounding Avalon Airport.

Safety message

This incident demonstrates that, while expediting traffic is an important objective for a controller, safety must always be the first consideration. In attempting to facilitate the helicopter's departure, the controller unintentionally placed it in the missed approach path of the aircraft. The strong westerly wind compounded the situation by slowing the helicopter and negating the effect of its westerly heading.

The incident also highlights the joint separation and communication responsibilities between crews and controllers in the Avalon airspace. When Avalon Tower is not active, the Avalon airspace is made up of Class G from surface to 700ft, then Class E. High performance IFR aircraft cannot remain in Class G airspace at Avalon while seeking a clearance to enter Class E.

General details

Occurrence details

Date and time:	4 July 2013 – 2040 EST	
Occurrence category:	Serious incident	
Primary occurrence type:	Loss of separation	
Location:	Avalon Airport, Victoria	
	Latitude: 38° 02.37' S	Longitude: 144° 28.17' E

Aircraft details: VH-VFJ

Manufacturer and model:	Airbus Industrie A320-232	
Registration:	VH-VFJ	
Operator:	Jetstar Airways Pty Ltd	
Serial number:	5311	
Type of operation:	Air transport - high capacity	
Persons on board:	Crew – Unknown	Passengers – Unknown
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Aircraft details: VH-VAO

Manufacturer and model:	Bell Helicopter Company 412EP	
Registration:	VH-VAO	
Serial number:	36507	
Type of operation:	Aerial work	
Persons on board:	Crew – 3	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

About the ATSB

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