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Australian Transport Safety Bureau

Loss of separation between a Schweizer 269C, VH-HYD and a Piper PA-31, VH-IBI

Moorabbin Airport, Victoria, 22 October 2013

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Addendum

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Loss of separation between a Schweizer 269C, VH-HYD and a Piper PA-31, VH-IBI

What happened

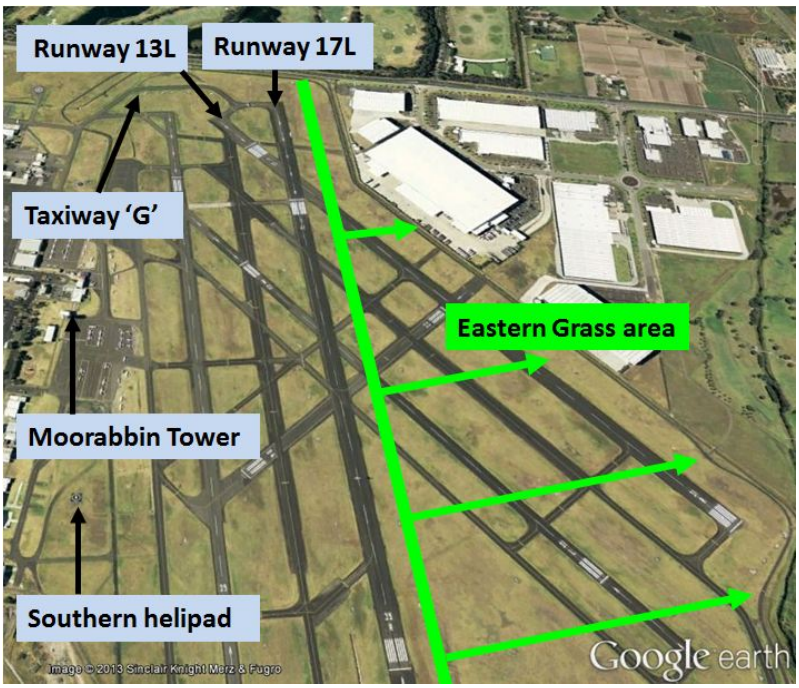
Moorabbin Airport

Source: Airservices Australia

On 22 October 2013, at about 0850 Eastern Daylight-savings Time (EDT), a flight instructor and student pilot of a Schweizer 269C helicopter, registered VH-HYD (HYD), taxied to the southern helipad to conduct circuits at Moorabbin Airport, Victoria, under the visual flight rules (VFR).

Runway 17 Left (17L) was the designated runway in use[1] at the time. The helicopter circuit area was the 'Eastern Grass', defined as the area extending from 20 m east of, and parallel to, runway 17L to the perimeter fence. When operating in this area, helicopter pilots were required to broadcast prior to becoming airborne for each circuit, but were otherwise not controlled by air traffic control (ATC) (Figure 1).[2]

Figure 1: Moorabbin Airport



Source: Google earth

There were two ATC positions active at the time; an aerodrome controller – east (ADCE), and a combined surface movement controller / coordinator position (SMC). The rostered aerodrome controller – west (ADCW) was in the tower but was not yet required as there was only one runway

[1] A runway in use is a runway under the control of the aerodrome controller. All runways are considered 'active' and a clearance is required to cross or enter any runway.

[2] As detailed in the En Route Supplement Australia, www.airservicesaustralia.com/aip/current/ersa/

in use. He was seated between ADCE and SMC, from where he was able to sight the aerodrome. ADCE had the runway strip for runway 17L on the runway bay on the console (Figures 2 and 3).

Figure 2: Aerodrome controller – east console

Source: Airservices Australia

Figure 3: Runway strip

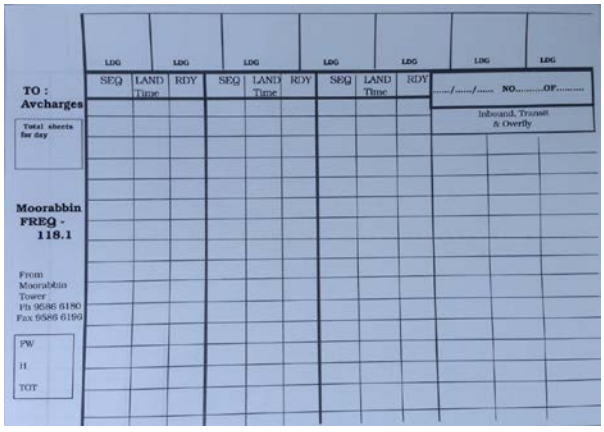
Source: Airservices Australia

The flight instructor of HYD requested and obtained a take-off clearance from ADCE. ADCE then placed the 'Helicopters' strip on the runway bay of the console and recorded HYD on the traffic sheet. At about 0905, the flight instructor of HYD broadcast 'airborne'. The ADCE controller read back this call and recorded the activity on the traffic sheet (Figures 4 and 5).

Figure 4: Helicopters strip (valid at the time of the occurrence)

Source: Airservices Australia

Figure 5: Traffic sheet (example)



Source: Airservices Australia

At about 0913, the pilot of another aircraft conducting circuits from runway 17L under the VFR at 1,000 ft above ground level (AGL), reported that the base of cloud moving into the area was at about 1,200 ft AGL. The reduced cloud base meant that fixed-wing aircraft conducting circuits must request a Special VFR (SVFR)[3] clearance. ATC are then required to provide a separation service between SVFR and other SVFR aircraft as well as between SVFR and instrument flight rules (IFR)[4] aircraft.[5]

At about 0914, an aircraft taxied to the runway 17L holding point in order to conduct solo circuits under the SVFR. Another aircraft was turning onto the base leg for a landing on runway 17L.

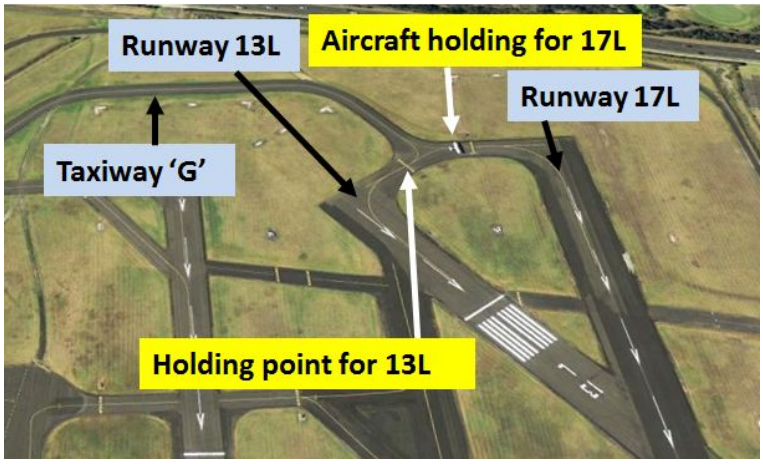
About 30 seconds later, the pilot of a Piper PA-31 aircraft, registered VH-IBI (IBI), requested a clearance from SMC for an IFR flight to Barnbougle Dunes, Tasmania, with 8 passengers on board. At about 0915, IBI commenced taxiing for runway 17L.

At about 0917, the pilot of the aircraft taxiing for circuits reported ready at the holding point for runway 17L.

ADCE was concerned about the deteriorating weather conditions, the solo student pilot of the SVFR aircraft and was attempting to expedite the departure of IBI. ADCE expected that the aircraft conducting circuits would request SVFR clearances, and IBI, operating IFR, would enter cloud after take-off. In order to ensure separation and to expedite the departure of IBI, ADCE elected to re-sequence the aircraft, so that IBI could depart before clearing the aircraft holding for circuits on 17L for take-off.

To facilitate re-sequencing of the aircraft, ADCE opted to change the departure runway for IBI from runway 17L to runway 13L. As IBI was already on taxiway 'G' and the aircraft ready for circuits was at the holding point for runway 17L, there was limited time to obtain coordination with SMC for the use of runway 13L and then alert the pilot of IBI to turn right towards the holding point for 13L, instead of left towards 17L prior to IBI reaching the intersection. ADCE also had to ensure adequate runway separation for the aircraft on base for runway 17L (Figure 6).

Figure 6: Holding points for runways 13L and 17L



Source: Google earth

ADCE then requested, and was given, jurisdiction of runway 13L from SMC. SMC handed ADCE the plastic runway 13L strip, and attempted to contact the pilot of IBI. As SMC did not get a

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[3] Special VFR applies in Class D airspace when meteorological conditions are less than that required for VFR. The definition is available at www.comlaw.gov.au/Details/F2010L01271

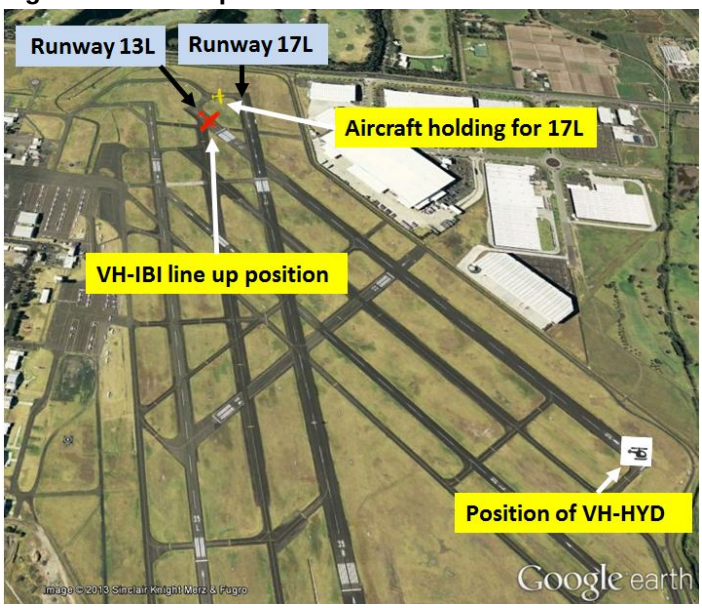
[4] Instrument flight rules permit an aircraft to operate in instrument meteorological conditions (IMC), which have much lower weather minimums than visual flight rules. Procedures and training are significantly more complex as a pilot must demonstrate competency in IMC conditions, while controlling the aircraft solely by reference to instruments. IFR-capable aircraft have greater equipment and maintenance requirements.

[5] www.casa.gov.au/wcmswr/_assets/main/pilots/download/classd_booklet.pdf

response on the ground frequency, ADCE then called the pilot on the tower frequency and offered the pilot the option to depart from runway 13L, which the pilot accepted.

At this time, the helicopter, HYD, was on the runway 31 Right threshold at the far end of runway 13L, however ADCE did not see the helicopter when conducting a scan of the runway prior to clearing IBI for take-off. ADCE reported that the 'Helicopters' strip on the console was not effective in alerting the controller to the presence of the helicopter (Figure 7).

Figure 7: Aircraft positions



Source: Google earth

At about 0918, ADCE cleared IBI for take-off from runway 13L. The pilot of IBI sighted the helicopter ahead, on the runway centreline, when about two-thirds of the way along the runway. As the aircraft had already exceeded the minimum rotate speed, the pilot continued the take-off, increased the aircraft's angle of climb, and IBI passed about 100-200 ft above HYD.

About 1 minute after IBI was cleared for take-off, the off-duty controller (ADCW) scanned runway 13L and sighted the helicopter on the runway, and immediately advised ADCE, however it was too late to advise the pilot of IBI as the aircraft was already taking off.

When at about 500 ft above ground level, the pilot of IBI asked ADCE whether ATC was aware there was a helicopter on the runway. ADCE replied that they had just realised it was there.

The instructor and student of HYD saw IBI pass overhead. At about 0920, the instructor of HYD reported 'airborne' and returned to the southern helipad.

Moorabbin tower procedures

Moorabbin tower used a combination of flight strips and traffic sheets. There was a permanent (green) strip for each runway (Figure 3). When a runway was in use, the strip for that runway was placed on the runway bay of the console by the aerodrome controller with the jurisdiction for that runway. All other runway strips were held on the runway bay of the console of the SMC position. A permanent strip for helicopters (Figure 4) was placed on the console in front of the aerodrome controller when helicopters were operating in the helicopter circuit area. There were also other permanent strips including 'runway occupied', 'overfly' and 'transit'.

A temporary flight strip was created for each IFR arrival and departure by SMC and used for coordination with Melbourne Centre air traffic control.

Unlike a number of other ATC towers in Australia, traffic sheets were used at Moorabbin to record aircraft movements, instead of Flight Progress Strips (FPS).

A review conducted by Airservices Australia in 2011 identified that the current practices at Moorabbin tower increased risk and that the practices could be changed to transition to an FPS-only environment. A trial of FPS found that due to the physical limitations of Moorabbin tower, the system could not be safely implemented.

ATC comments

The Moorabbin air traffic controllers provided the following comments:

- the helicopter strip was on the console but there was no trigger to check it as the traffic sheet was being used to monitor aircraft movements
- the small helicopters can be difficult to see when they are operating at the far end of the aerodrome
- the use of traffic sheets placed greater reliance on the controller's ability to keep a mental picture of the situation as conflicts were not displayed visually on the sheet
- the outside of the tower windows were normally washed each week, but had not been washed for over a month due to strong winds reducing the visibility from the tower.
- When runway works were being conducted, a 'works' strip was placed over the relevant runway by SMC. SMC suggested that putting 'helicopters' on the works strip as a secondary check, may provide a reminder to check for helicopters when handing a runway strip to ADC. To achieve this, ADC would be required to advise SMC of helicopter operations, as VFR helicopter flights obtained clearances from ADC and did not contact SMC.

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.

Moorabbin Tower (Airservices Australia)

As a result of this occurrence, the Moorabbin Tower Manager advised the ATSB that they have changed the colour of the 'Helicopters' strip from yellow to bright orange to make it more visible.

In a comprehensive review of the incident and a report provided to the ATSB, Airservices Australia has committed to the following actions:

- Amend local procedures at Moorabbin associated with helicopter operations including the Eastern Grass training area as follows: ADC to request release of helicopter training areas from the SMC; SMC to display a helicopter training area reminder strip underneath the runway jurisdiction strip/s when helicopter training areas are active; and SMC to indicate active helicopter areas on the reminder strip. Coordination will be required between ADC and SMC for activation of the training areas and the SMC and ADC will display a helicopter reminder strip.
- Conduct a review of the local ATC procedures at Moorabbin for: the use of FPS for IFR departing and arriving aircraft; and the use and format of traffic running sheets and memory prompts for optimum controller situation awareness.
- Review the clearance requirements for helicopter training areas to clarify the discrepancy between AIP requirements and ERSA descriptions.

Safety message

The ATSB report *Loss of separation between aircraft in Australian airspace January 2008 to June 2012*, found that Moorabbin Airport had the highest overall collision risk of any towered airport. This was related to the large number of occurrences (due in part to the large number of aircraft movements, and a complex arrangement of taxiways to deal with three runways), and the

relatively high number of occurrences with an elevated or some collision risk. www.atsb.gov.au/publications/2012/ar-2012-034.aspx

The report states that

> Both the air traffic controller and the pilots of aircraft under the controller's jurisdiction have responsibilities for maintaining separation, and errors by either or both can lead to a loss of the separation standard. However, through the ATS system, it is the controller that is provided with the bigger picture of the positions and proximity between all aircraft in their airspace, and who therefore has accountability for keeping those aircraft apart.

The report found that high workload was by far the most common factor contributing to controller errors across loss of separation occurrences.

Further information about operating in Class D airspace, including Special VFR procedures, can be found at www.casa.gov.au/wcmswr/_assets/main/pilots/download/classd_booklet.pdf

General details

Occurrence details

Date and time:	22 October 2013 – 0919 EDT	
Occurrence category:	Serious incident	
Primary occurrence type:	Airprox	
Location:	Moorabbin Airport, Victoria	
	Latitude: 37° 58.55' S	Longitude: 145° 06.13' E

Aircraft details: VH-HYD

Manufacturer and model:	Schweizer Aircraft Corporation	
Registration:	VH-HYD	
Serial number:	0179	
Type of operation:	Flying training – dual	
Persons on board:	Crew – 2	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	None	

Aircraft details: VH-IBI

Manufacturer and model:	Piper Aircraft Corporation	
Registration:	VH-IBI	
Serial number:	31-7552035	
Type of operation:	Charter - Passenger	
Persons on board:	Crew – 1	Passengers – 8
Injuries:	Crew – Nil	Passengers – Nil
Damage:	None	

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.