Australian Government
Australian Transport Safety Bureau

TCAS advisory involving Bombardier DHC-8-315, VH-SBG

Near Brisbane Airport, Queensland, 6 November 2012

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Aviation Occurrence Investigation
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TCAS advisory involving Bombardier DHC-8-315, VH-SBG

What happened

On 6 November 2012 at about 1250 Eastern Standard Time[1], a Bombardier DHC-8-315 aircraft, registered VH-SBG (SBG) was conducting a visual day circling approach, for a landing on runway 01 at Brisbane airport, Queensland. At the same time, a Eurocopter EC120B, registered VH-EHA (EHA) was preparing to depart from Doomben racecourse, which was located near to the expected base intercept position for the approach to runway 01.

VH-SBG

Source: George Canciani – courtesy Airliners.net

Prior to departing Doomben, a Brisbane Tower air traffic controller advised the pilot of EHA that a 2 to 3 minute delay for departure was expected, due to inbound aircraft. The pilot of EHA advised the controller that he therefore expected to take-off in 2 minutes.

About 50 seconds later, the controller advised the pilot of EHA that SBG was approaching from the north-west and that aircraft was required to be visually identified. The helicopter pilot confirmed sighting SBG and was subsequently issued a clearance to depart Doomben and track direct for the Brisbane central business district (CBD) at an altitude not above 1,000 ft, with a condition to maintain visual separation with SBG.

Shortly after the issuing the departure clearance to the pilot of EHA, the controller advised the flight crew of SBG that the helicopter was getting airborne at Doomben to track direct to the CBD and that the pilot would maintain separation. Upon receiving the traffic information, the flight crew of SBG visually identified that the helicopter was on the ground at Doomben, before they lost sight of it beneath the aircraft's nose. The flight crew reported that as they had confirmed the helicopter's relative position, the risk of conflict was considered unlikely and a descent to intercept a base position for runway 01 was continued. In addition to visually identifying EHA, the flight crew of SBG also had the helicopter identified on the aircraft's Traffic Collision Avoidance System (TCAS)[2] as a Traffic Advisory (TA)[3]. No action was required to be taken in response to a TCAS TA.

A short time after the TCAS TA, the flight crew of SBG received a TCAS Resolution Advisory (RA)[4], as a result of the helicopter commencing a take-off and climbing during its departure from Doomben. Radar information and recorded aircraft flight data showed that SBG descended to an altitude of about 1,200 ft as it approached the Doomben area, while at the same time EHA climbed to an altitude of about 800 ft. That was also about the time the flight crew of SBG initiated a climb in response to the TCAS RA. The lateral distance between the two aircraft was about 0.3 NM (555 m).

The first officer, who was the pilot flying (PF), responded to the TCAS RA by increasing the aircraft's engine power and climbing until advised by the aircraft's TCAS system that they were

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

2 Traffic Collision Avoidance System (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.

3 Traffic Collision Avoidance System Traffic Advisory, when a TA is issued, pilots are instructed to initiate a visual search for the traffic causing the TA.

4 Traffic Collision Avoidance System Resolution Advisory, when an RA is issued pilots are expected to respond immediately to the RA unless doing so would jeopardize the safe operation of the flight.

'clear of conflict'. Once clear of the conflict, the PF reduced the rate of climb and looked to the Captain for confirmation to continue or discontinue the approach to land.

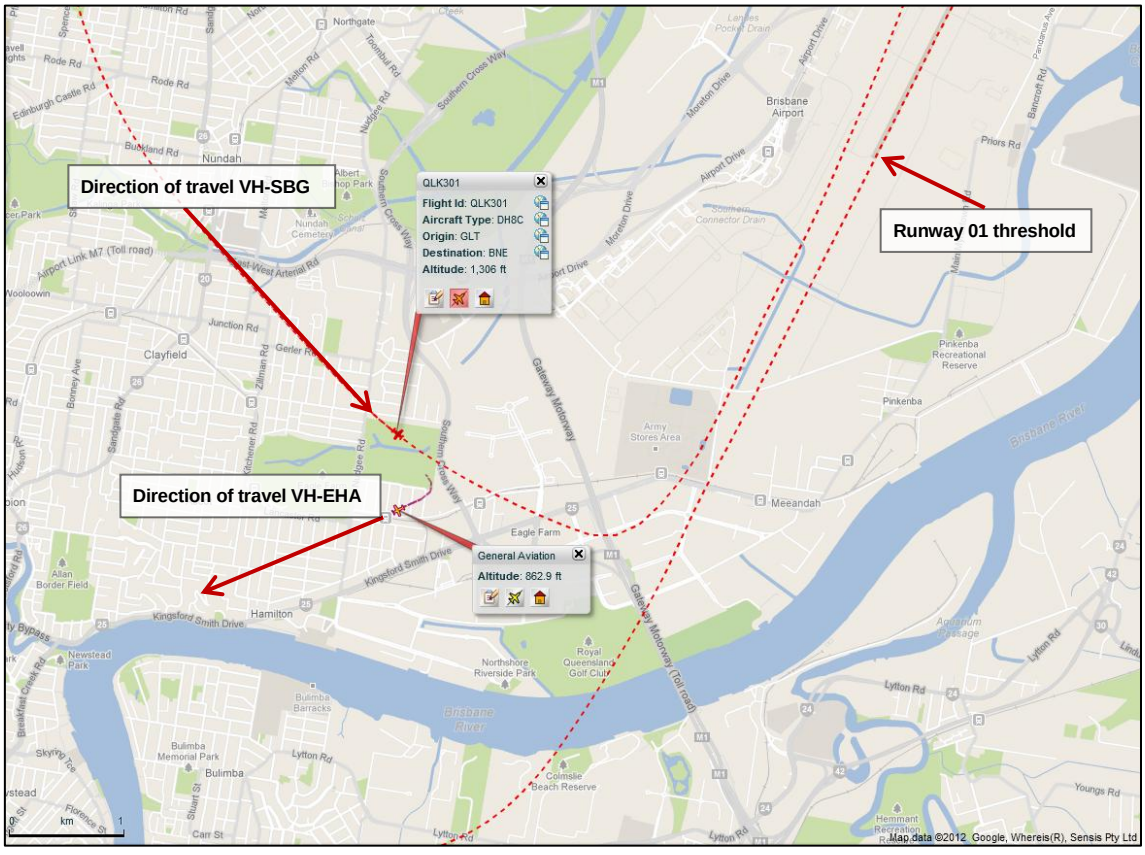
The PF was monitoring the aircraft radios and heard the Captain announce the TCAS RA to the Brisbane Tower along with his intention to discontinue the approach and conduct another circuit. As a result of the radio communication, the PF discontinued the approach and initiated a climb.

The crew stated that they were experiencing a higher than normal workload because of the unexpected TCAS RA. The Captain therefore assumed the role of PF and called for a go-around to be conducted. As a result, the first officer assumed the role of pilot monitoring (PM) which included performing the required action items in response to the PF's commands, managing the radios, and conducting other tasks associated with the PM role.

The requirement by the flight crew of SBG to conduct another circuit meant that the controller had to accommodate SBG into the existing landing sequence for runway 01. Approximately 4 minutes after the TCAS RA was announced, the Tower controller decided that to facilitate the sequencing of arrivals for runway 01, all departures were temporarily suspended.

The flight crew of SBG conducted a left circuit and landed on runway 01 without further incident.

Figure 1: Aircraft flight paths



Source: ***Airservices Australia***

ATSB comment

In this occurrence the approaching aircraft's defence systems activated and alerted the flight crew of the potential traffic conflict. The flight crew took appropriate action in response to the resulting TCAS RA despite the assurance by the pilot of EHA that he was maintaining visual separation with SBG.

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.

Airservices Australia

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

Update to the Manual of Air Traffic Standards

The Manual of Air Traffic Standards (MATS) was updated on 15 November 2012. The update requires air traffic controllers to provide additional consideration of performance characteristic prior to assigning visual separation to the pilot.

Specifically, MATS 10-50-221 (d) requires the controller to consider the possibility of a TCAS Resolution Advisory due to closer proximity of operation prior to assigning visual separation.

Safety message

Pilots and air traffic controllers should be mindful that although a timely departure may be desirable, a resolution advisory may be triggered on TCAS equipped aircraft despite visual separation being maintained. Consideration therefore should be given to the potential activation of a TCAS RA and the subsequent operational effects that may have.

General details

Occurrence details

Occurrence category	Incident	
Primary occurrence type:	TCAS advisory	
Location:	1.6 NM (3 km) south west of Brisbane Airport, Queensland	
	S 27° 23.05'	E 153° 07.05'

VH-SBG

Manufacturer and model:	Bombardier DHC-8-315
Registration:	VH-SBG
Operator:	Qantaslink
Type of operation:	Regular public transport
Damage:	None

VH-EHA

Manufacturer and model:	Eurocopter EC120B
Registration:	VH-EHA
Type of operation:	Charter
Damage:	None

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.