Australian Government
Australian Transport Safety Bureau

Aircraft proximity event between a Kawasaki BK117, VH-CSG and a Cessna 404, VH-XDA

22 km WNW of Townsville Airport, Queensland, 13 June 2012

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Addendum

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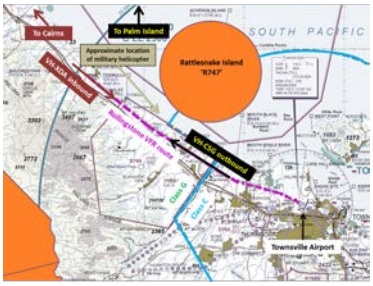
Aircraft proximity event between a Kawasaki BK117, VH-CSG and a Cessna 404, VH-XDA

What happened

On 13 June 2012, at about 1458 Eastern Standard Time,[1] a Kawasaki BK117 helicopter, registered VH-CSG (CSG), departed Townsville on a flight to Cairns, Queensland, under the visual flight rules (VFR). The pilot requested a clearance from Townsville (military) air traffic control (ATC) to track outbound via the Rollingstone VFR route (Figure 1) at 1,000 ft. The pilot received a subsequent clearance to operate in Class C[2] airspace, not above 1,000 ft.

Rollingstone VFR route



Source: Airservices Australia

At about the same time, a West Wing Aviation Cessna 404 aircraft, registered VH-XDA (XDA), was inbound to Townsville from Palm Island, under the instrument flight rules (IFR). The aircraft was cleared by ATC to enter the Townsville military controlled airspace via the Rollingstone VFR route, at 1,500 ft, visual. This provided the required 500 ft vertical separation with CSG.

The initial section of the Rollingstone VFR route from Townsville was inside Townsville controlled airspace (Class C), while the latter part was outside controlled airspace (Class G)[3] when operating below 2,500 ft (Figure 1).

At 1502, the Townsville Approach controller (trainee) advised the pilot of CSG that he was now outside Class C airspace; provided traffic information[4] on a military helicopter operating in the vicinity, about 10 NM ahead, on descent to 2,500 ft (operating in Class C); and that the Brisbane Centre frequency was available when 36 NM from Townsville. The pilot acknowledged the call.

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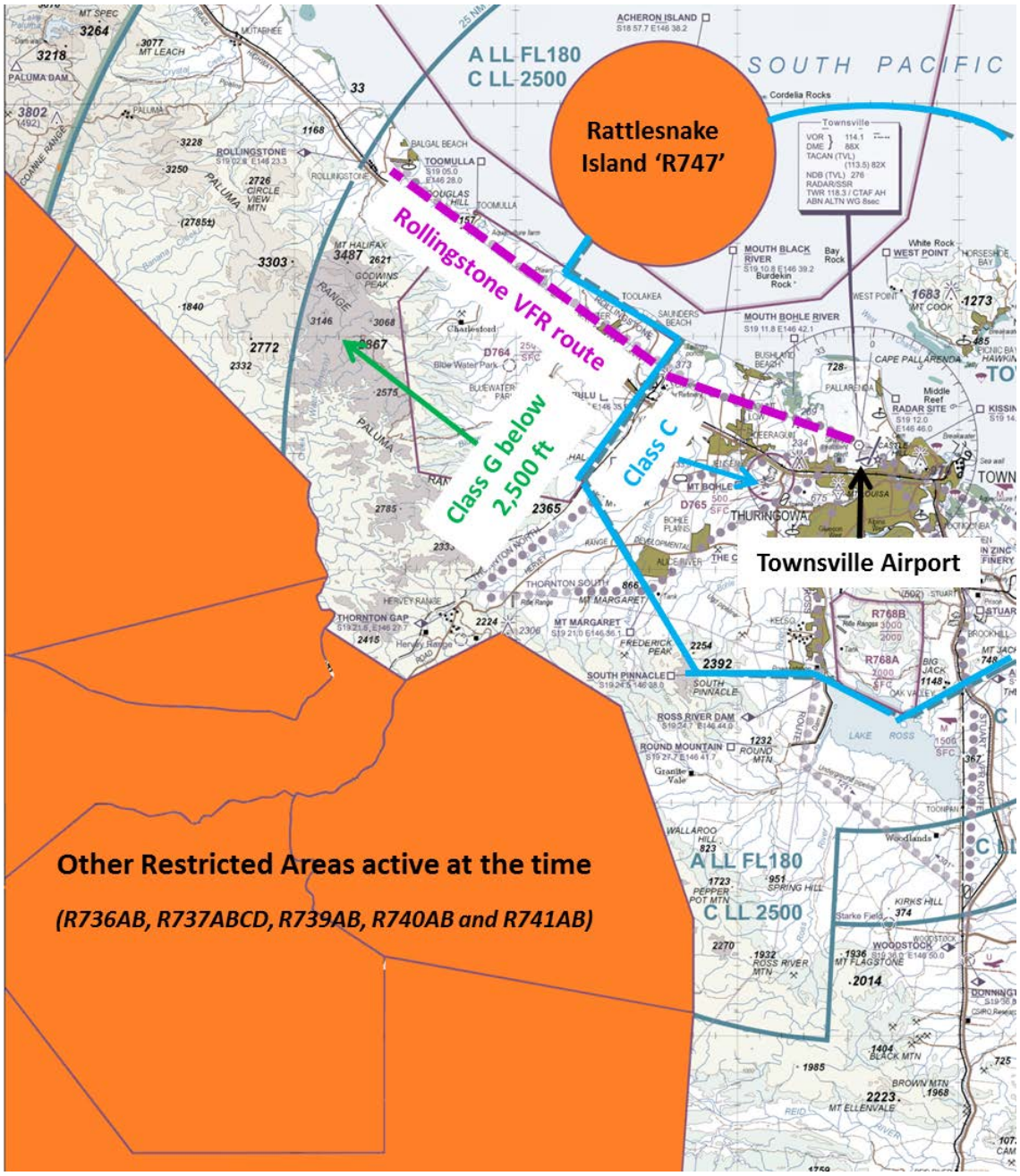
1 Eastern Standard Time (CST) was Coordinated Universal Time (UTC) + 10 hours.

2 All aircraft must get an airways clearance and communicate with ATC in Class C airspace. Instrument flight rules (IFR) aircraft are positively separated from both IFR and VFR aircraft. VFR aircraft are provided traffic information on other VFR aircraft.

3 IFR and VFR flights are permitted and do not require an airways clearance in Class G airspace. 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 Information used by ATC to alert a pilot to other known or observed air traffic which may be in proximity to the position or intended route of flight and to help the pilot avoid collision (Manual of Air Traffic Services).

Figure 1: Townsville airspace



Source: Airservices Australia

At this time, CSG and XDA were tracking along the Rollingstone VFR route in opposite directions, with about 15 NM lateral separation (Figure 2). The Approach trainee reported that, as CSG and XDA were more than 8 NM apart, the trainee intended to provide traffic information at a later stage, when the aircraft were close enough to be sighted by each pilot.

Soon after, the Approach trainee determined that the military helicopter may be a potential conflict for CSG and instructed the pilot of CSG to remain on the Townsville Approach frequency to ensure traffic updates could be provided, if required.

At 1504:05, the Approach trainee provided the pilot of the military helicopter with information on XDA. Shortly after, the pilot of XDA was also advised of the military helicopter, which was about 1 NM ahead in his 11 o'clock[5] position, operating above the Rollingstone VFR route at 2,500 ft. The pilot of XDA advised ATC that he had the military helicopter sighted. He continued to monitor that helicopter.

At 1504:30, the Department of Defence radar surveillance data[6] showed that CSG was at 1,000 ft and XDA was at 1,500 ft, with 7 NM lateral separation.

The pilot of CSG reported that he was aware of an aircraft operating in the area at 2,500 ft. Consequently, when CSG was in Class G airspace, the pilot elected to commence a slow climb to 1,500 ft, to maintain separation with the known traffic.

At 1504:40, the radar data showed that CSG was climbing through 1,300 ft and XDA was at 1,400 ft, with 2.8 NM lateral separation.

At 1506:20, the radar indicated that CSG was at 1,400 ft and XDA was at 1,500 ft, with 0.1 NM lateral separation. At that time, the pilot of CSG observed an aircraft ahead (XDA) and immediately descended. The pilot of CSG reported that he was at 1,260-1,280 ft when he passed an estimated 20-30 ft below XDA.

The pilot of XDA was in the process of broadcasting an inbound call on the company frequency when he observed a 'flash' (CSG) an estimated 6 ft below. The pilot immediately initiated a climb.

At 1506:30, after passing, the radar data showed both CSG and XDA were at 1,500 ft. Immediately after, the data showed CSG descending.

The pilot of XDA contacted the Townsville Approach trainee requesting information on the helicopter and advised that it nearly 'clipped' his aircraft. The Approach trainee advised the pilot that the helicopter was operating on the Rollingstone VFR route, not above 1,000 ft.

Both pilots reported that they were not aware of each other prior to the incident.

The Approach trainee, Approach Supervisor and Training Commander reported that the incident occurred during a complex sequence: there were multiple arrivals and departures; faster following jet aircraft; aircraft being vectored; and multiple active Restricted Areas. At the time, the traffic levels were considered above normal and they were primarily focusing on aircraft in Class C airspace and had placed a lower priority on XDA and CSG operating in Class G airspace. Consequently, traffic information was not provided to XDA and CSG.

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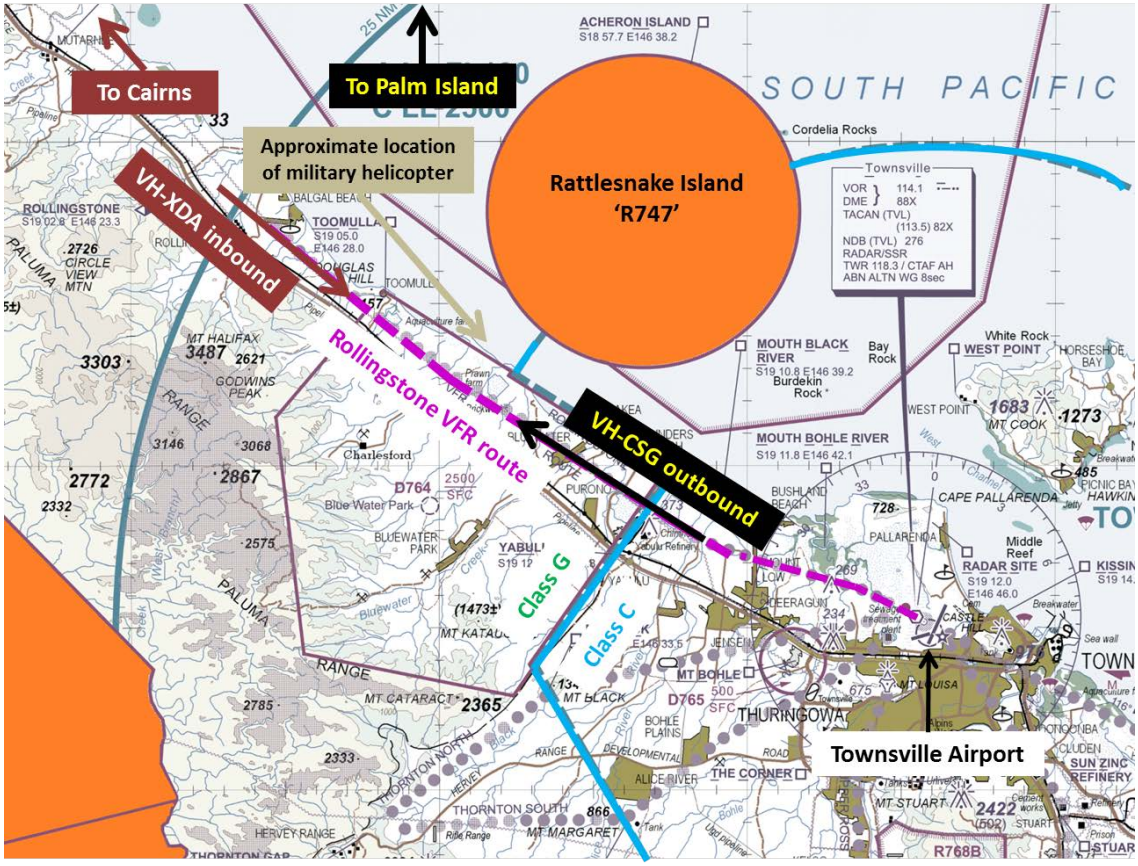
5 The clock code is used to denote the direction of an aircraft or surface feature relative to the current heading of the observer's aircraft, expressed in terms of position on an analogue clock face. Twelve o'clock is ahead while an aircraft observed abeam to the left would be said to be at 9 o'clock.

6 Altitude data was only displayed to the nearest 100 ft.

Figure 2: Positions along the Rollingstone VFR route



Source: Airservices Australia

Air traffic control

Approach trainee information

The Approach trainee had a total of 6 years ATC experience, with the majority of this obtained in both the Approach and Tower environments at Pearce, Western Australia. The controller had been at Townsville for 5 months and had completed about 75 hours of on-the-job training. At the time of the incident, the trainee was undergoing a proficiency assessment for the Townsville Approach endorsement. The trainee was being assessed by the Training Commander.

Supervision and monitoring

Townsville Approach ATC comprised a Planner position, the Approach trainee, and an Approach Supervisor. The Approach Supervisor provided advice on aircraft sequencing and assisted where required. The Approach Training Commander was also present in the room.

The Approach trainee reported that input from both the Approach Supervisor and Training Commander was being provided at the time of the incident.

Due to a broad area of responsibility, it was difficult for the Approach Supervisor to continually monitor every action of the Approach trainee. As a result of these responsibilities, the Supervisor's attention was not only divided between the Approach trainee and the Planner, but also diverted away from the current traffic situation. The Supervisor did, however, request that the Approach trainee keep CSG on the Townsville Approach frequency to maintain situation awareness and to provide traffic information, if required.

Townsville airspace

The Townsville Approach position was responsible for controlling airspace out to 36 NM, up to flight level (FL)[7] 220. On the day, there were a number of Restricted Areas active,[8] including the Rattlesnake Island 'R747' area (Figure 1). When R747 was active, aircraft departing/arriving Townsville to/from the north, north-west were directed via the western VFR diversion, the Rollingstone VFR route. Consequently, CSG was cleared to leave and XDA was cleared to enter Townsville Class C airspace via the Rollingstone VFR route.

The Approach Training Commander reported that the activation of R747 was a rare occurrence and there were minimal options available to controllers for diverting aircraft around that area. This was the first time the Approach trainee had seen R747 active and had military jet aircraft operating in R740 and R741 (Figure 1).

Flight information service (FIS) and traffic information in Class G

The Aeronautical Information Publication (AIP) En Route 1.4, paragraph 3.1.3, stated that, when operating in Class G, IFR flights receive traffic information and a flight information service (FIS).[9] Visual flight rules flights receive a FIS and may receive a surveillance information service (SIS)[10] if requested, dependent on ATC workload. CSG was not in receipt of a SIS at the time.

The AIP General 3.3, paragraph 2.13.1 further stated that:

> A traffic information service will be provided, where applicable, depending on higher priority duties of the controller or other limitations; eg, surveillance limitations, volume of traffic, frequency congestion, or controller workload. Traffic information does not relieve pilots of their responsibility to see and avoid other aircraft. Pilots are cautioned that there are many times when the controller is not able to give traffic information concerning all traffic in the aircraft's vicinity; in other words, when a pilot requests or is receiving traffic information, he/she should not assume that all traffic will be issued.

Approach trainee comments

The Approach trainee provided the following comments regarding the incident:

- *Workload:* As a result of the above normal traffic conditions, the Approach trainee reported that the workload at the time was high. Also, the trainee's attention was diverted by the Training Commander and Approach Supervisor.

  While the Approach trainee recognised that traffic information could have been passed earlier, if faced with a similar situation in the future, the trainee would not change priorities.
- *Previous experience:* Townsville was the first location the Approach trainee had used the Australian Defence Air Traffic System (ADATS); Pearce used The Australian Advanced Air Traffic System (TAAATS). In addition, while they did not provide a FIS at Pearce, they did provide traffic information to arriving/departing aircraft, but not to the same level as that provided at Townsville.
- *Stress:* The Approach trainee was undergoing a proficiency assessment, which, along with the workload, created a stressful environment.

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7 At altitudes above 10,000 ft in Australia, an aircraft's height above mean sea level is referred to as a flight level (FL). FL220 equates to 22,000 ft.

8 Restricted Areas active at the time were R736AB, R737ABCD, R739AB, R740AB, R741AB and R747.

9 A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights (Aeronautical Information Publication (AIP) General 2.2).

10 An on-request service provided to assist pilots of VFR flights, within ATC surveillance system coverage in Class E and G airspace, to avoid other aircraft or to assist in navigation (AIP General 2.2).

Training Commander comments

When CSG exited Class C airspace, the Approach Training Commander reported that there was about 15 NM lateral and 500 ft vertical separation with XDA. The Training Commander elected not to instruct the Approach trainee to provide traffic information at that time as it would have been more useful to the pilot when CSG and XDA were closer. Furthermore, CSG was not observed climbing as the Training Commander's attention was focused on the aircraft in Class C.

Approach Supervisor comments

The Approach Supervisor reported that CSG was cleared not above 1,000 ft while operating in Class C. However, while entitled to, they did not expect the pilot of CSG to climb above that level when in Class G. In hindsight, they would have passed traffic information between CSG and XDA, however, they believed the respective altitudes were sufficient and they were prioritising conflicts in Class C.

Pilot comments (VH-XDA)

The pilot of XDA provided the following comments regarding the incident and operations at Townsville:

- *Visibility:* When viewed from the cockpit, there would have been no obvious relative movement of CSG,[11] which would have had made it difficult to apply the see-and-avoid principles. Furthermore, as the helicopter (CSG) was at a lower altitude, it may have been obscured by the suburbs and terrain in the background.
- *Attention:* He was in the process of broadcasting a call to company and was maintaining separation with the military helicopter operating in close proximity, which demanded his attention. He prioritised his tasks, but believed he was still maintaining a lookout.
- *Traffic information.* The Approach controllers at Townsville generally provided traffic information, particularly when arriving/departing Class C. This may have resulted in some degree of complacency, with an absence of traffic information inferring nil traffic in the area. If the pilot had received traffic information on CSG, he would have maintained an active lookout for the helicopter.
- *Traffic conditions:* There was a reaonable number of aircraft arriving and departing Townsvillle at the time and the military exercise being conducted appeared to hinder traffic flow management.

Pilot comments (VH-CSG)

The pilot of CSG reported hearing an aircraft operating in the Rollingstone area at 2,500 ft, but was not aware of any other aircraft in the vicinity. He reported that he was maintaining a listening watch of the radio broadcasts, but may have missed a call regarding other traffic as there had been a number of broadcasts made at that time. Despite the amount of radio traffic, the pilot stated that in hindsight, he could have broadcast a call advising of his intentions to climb to 1,500 ft. In addition, the pilot stated that, due to the terrain ahead in his line of sight, he did not observe the aircraft (XDA) until in close proximity.

Department of Defence findings

The Department of Defence conducted an internal investigation into the incident and made the following findings:

- *Supervision:* Supervision from the Approach Supervisor was deemed adequate for the traffic levels experienced.

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[11] Due to the geometry of collision flight paths, an aircraft on a collision course will usually appear to be a stationary object in the pilot's visual field (ATSB publication 'Limitations of See-and-Avoid Principle').

- *R747 diversion:* XDA was operating under IFR, tracking via a VFR diversion on a regularly used VFR route.
- *FIS:* The Approach trainee, Training Commander, and Approach Supervisor were prioritising the provision of air traffic services to aircraft operating in Class C over the provision of a FIS to aircraft operating in Class G. While this led to compromised safety between XDA and CSG, this was not evident to the controllers as the prioritisation of tasks in Class C reduced their situational awareness of the developing situation in Class G.

  Segregation and traffic information was provided between XDA and the military helicopter, however, at that time, XDA and CSG were not an immediate confliction and the focus of the controllers had moved to other tasks.
- *Traffic considerations and proficiency assessment:* The traffic levels at the time resulted in the Approach trainee experiencing a considerable workload, while concurrently undergoing a proficiency assessment. The trainee was prioritising the immediate conflictions, which required continual monitoring of the Class C.

  Furthermore, due to the traffic levels, both the Approach Supervisor and Training Commander were providing input to the Approach trainee. While this was considered necessary, the increased input reduced the trainee's ability to conduct comprehensive scans and continually asses the complete air picture, including the situation in Class G.
- *Error of expectation:* The Approach trainee, Training Commander and Approach Supervisor had expected CSG to continue operating not above 1,000 ft when in Class G as this level was requested by the pilot. However, the pilot of CSG was entitled to change this level when in Class G. The pilot commenced a climb, which occurred over a short period of time and was not detected by the controllers, nor was the proximity of CSG and XDA as the controllers were focusing on other tasks.

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.

Department of Defence

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

- Controllers have been briefed on the importance of providing accurate traffic information to IFR aircraft operating in Class G.
- A training package has been incorporated into the Approach controller training guide to further develop controller understanding of the provision and importance of a FIS.

Safety message

The timely provision of traffic information by ATC assists pilots in gaining an enhanced awareness of the traffic situation. However, pilots should be mindful that the provision of such information is dependent on the category of flight rules (IFR or VFR), the class of airspace, and the workload of the controller at the time. Consequently, pilots should continue to apply both alerted and unalerted see-and-avoid techniques and not rely solely on this service for traffic awareness. This is particularly important when operating in areas such as defined VFR routes. The following ATSB publication provides additional information on see-and-avoid principles: www.atsb.gov.au/publications/1991/limit_see_avoid.aspx

General details

Occurrence details

Occurrence category:	Serious incident	
Primary occurrence type:	Aircraft proximity event	
Location:	22 km WNW of Townsville Airport, Queensland	
	Latitude: 19° 09.08' S	Longitude: 146° 35.97' E

Kawasaki BK117, VH-CSG

Manufacturer and model:	Kawasaki Heavy Industries BK117 B-1	
Registration:	VH-CSG	
Type of operation:	Private/business	
Persons on board:	Crew – 1	Passengers – Unknown
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Cessna 404, VH-XDA

Manufacturer and model:	Cessna Aircraft Company 404	
Registration:	VH-XDA	
Type of operation:	Air transport – low capacity	
Operator	West Wing Aviation	
Persons on board:	Crew – 1	Passengers – Unknown
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.