



Australian Government

Australian Transport Safety Bureau

ATSB TRANSPORT SAFETY INVESTIGATION REPORT

Aviation Occurrence Report – 200600396

Final

**Infringement of Separation Standards
Waypoint APOMA – 25 January 2006
VH-VXC and 9VSVH**



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Abstract

On 25 January 2006, a Boeing Company 777-200 (777) was en route from Christchurch, NZ, to Singapore at flight level (FL) 360. A Boeing Company 737-838 (737) was en route from Alice Springs, NT, to Sydney, NSW, on a reciprocal track at FL370. At 0422.30 Coordinated Universal Time the two aircraft passed each other in the vicinity of waypoint APOMA, in the Melbourne Flight Information Region.

The pilots of the 777 had requested a clearance to climb to FL380. The separation standard that was applicable between the two aircraft, before the air traffic controller could authorise climb for the 777, was a ten minute longitudinal standard. That standard required the controller to calculate the estimated time the two aircraft would pass, using a method approved in the Manual of Air Traffic Services. Once that estimated time of passing was established, ten minutes either prior to, or after, that time of passing had to be applied. In the circumstances, a vertical separation standard needed to exist from the estimated time of passing plus the ten minutes. The crew of the 777 had been instructed to climb to FL380 at the estimated time of passing plus 8.5 minutes. There was an infringement of separation standards.

The air traffic controller's initial scan of the air situation display was incomplete and did not detect that a procedural separation standard would not exist between the 737 and the 777, or that he needed to calculate the time that the 10 minute longitudinal separation standard was established. A more comprehensive initial scan of the air situation display by the controller may have facilitated timely action to avoid an infringement of separation standards.

THE AUSTRALIAN TRANSPORT SAFETY BUREAU

The Australian Transport Safety Bureau (ATSB) is an operationally independent multi-modal Bureau within the Australian Government Department of Transport and Regional Services. ATSB investigations are independent of regulatory, operator or other external bodies.

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. Accordingly, the ATSB also conducts investigations and studies of the transport system to identify underlying factors and trends that have the potential to adversely affect safety.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and, where applicable, relevant international agreements. The object of a safety investigation is to determine the circumstances to prevent other similar events. The results of these determinations form the basis for safety action, including recommendations where necessary. As with equivalent overseas organisations, the ATSB has no power to implement its recommendations.

It is not the object of an investigation to determine blame or liability. However, it should be recognised that an investigation report must include factual material of sufficient weight to support the analysis and findings. That material will at times contain information reflecting on the performance of individuals and organisations, and how their actions may have contributed to the outcomes of the matter under investigation. 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.

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. While the Bureau issues recommendations to regulatory authorities, industry, or other agencies in order to address safety issues, its preference is for organisations to make safety enhancements during the course of an investigation. The Bureau is pleased to report positive safety action in its final reports rather than make formal recommendations. Recommendations may be issued in conjunction with ATSB reports or independently. A safety issue may lead to a number of similar recommendations, each issued to a different agency.

The ATSB does not have the resources to carry out a full cost-benefit analysis of each safety recommendation. The cost of a recommendation must be balanced against its benefits to safety, and transport safety involves the whole community. Such analysis is a matter for the body to which the recommendation is addressed (for example, the relevant regulatory authority in aviation, marine or rail in consultation with the industry).

The 24-hour clock is used in this report to describe the time of day, Standard Time was Coordinated Universal Time (UTC).

FACTUAL INFORMATION

The Australian Transport Safety Bureau did not conduct an on-scene investigation into this occurrence. The following report is principally based on information from an investigation report into the occurrence that was produced by Airservices Australia.

On 25 January 2006, a Boeing Company 777-200 (777) was en route from Christchurch, NZ, to Singapore at flight level (FL) 360. A Boeing Company 737-838 (737) was en route from Alice Springs, NT, to Sydney, NSW, on a reciprocal track at FL370. At 0422.30 Coordinated Universal Time the two aircraft passed each other in the vicinity of waypoint APOMA, in the Melbourne Flight Information Region.

At 0430, using controller pilot data link communications (CPDLC)¹, the crew of the 777 requested a clearance, from the Bourke (BKE) sector controller, to climb to FL380. As the aircraft was approaching the adjoining Woomera (WRA) sector airspace boundary at that time, the BKE controller transferred control responsibility of the 777 to the WRA controller.

The BKE controller then advised the WRA controller of other aircraft within the BKE sector airspace that needed to be considered by the WRA controller, before the WRA controller could issue a clearance to climb to the crew of the 777. That advice did not include information about the 737. Both aircraft were outside radar coverage and the controllers were separating the two aircraft using non-radar, or procedural², control.

When aircraft are outside radar coverage, The Australian Advanced Air Traffic System generates an automatic track symbol on the air situation display (ASD) for controller reference. These symbols represent an approximate position of the aircraft only. Controllers are not permitted to determine whether two aircraft that are outside radar coverage have passed, or to establish separation standards, by reference to the ASD symbols, in these circumstances.

The 777 pilots could not be issued with a clearance to climb until a longitudinal time separation standard existed between the 777 and the 737. According to the Airservices report, the applicable longitudinal time separation standard in such circumstances was 10 minutes after the time that the two aircraft were estimated to have passed. The WRA controller was required to calculate that time of passing. The existing 1,000 ft vertical separation standard was required until ten minutes after that calculated time.

Upon accepting responsibility for the control of the 777, and based on the information provided by the BKE controller, the WRA controller was unaware that the 737 represented a climb restriction for the 777. On that basis, the WRA controller cleared the 777 crew to climb to FL380. That clearance instruction was

¹ Controller Pilot Data Link Communications (CPDLC) is a means of communications between a controller and pilot using text-based messages via an air traffic control data link.

² Procedural control is the provision of air traffic control services using information derived from sources other than radar.

given to the crew of the 777 at the estimated time of passing plus 8.5 minutes, and resulted in an infringement of separation standards. The BKE controller identified that infringement on a subsequent scan of the ASD.

ANALYSIS

The Bourke (BKE) sector controller was responsible for ensuring that a separation standard existed between the two aircraft, even though the 777 was in the Woomera sector and the pilots were not on the BKE controller's frequency. The BKE controller did not recognise that separation would be infringed if the 777 pilots were cleared to climb their aircraft to FL380 until after separation was infringed.

The Bourke controller's initial scan of the air situation display (ASD) was incomplete and did not detect that a procedural separation standard would not exist between the 737 and the 777, or that he needed to calculate the time that the 10 minute longitudinal separation standard was established. A more comprehensive initial scan of the ASD by the BKE controller may have facilitated timely action to avoid an infringement of separation standards.

SAFETY ACTION

Airservices Australia

A Flight Plan Conflict Probe (FPCP) is being developed as an enhancement to The Australian Advanced Air Traffic System functionality. The FPCP is a situational awareness tool that should provide an alert to controllers when two or more aircraft may be in conflict, or when a proposed action, such as a change of level, has the potential to result in an infringement of separation standards. Airservices Australia intends to commission the FPCP as soon as software testing results prove satisfactory.