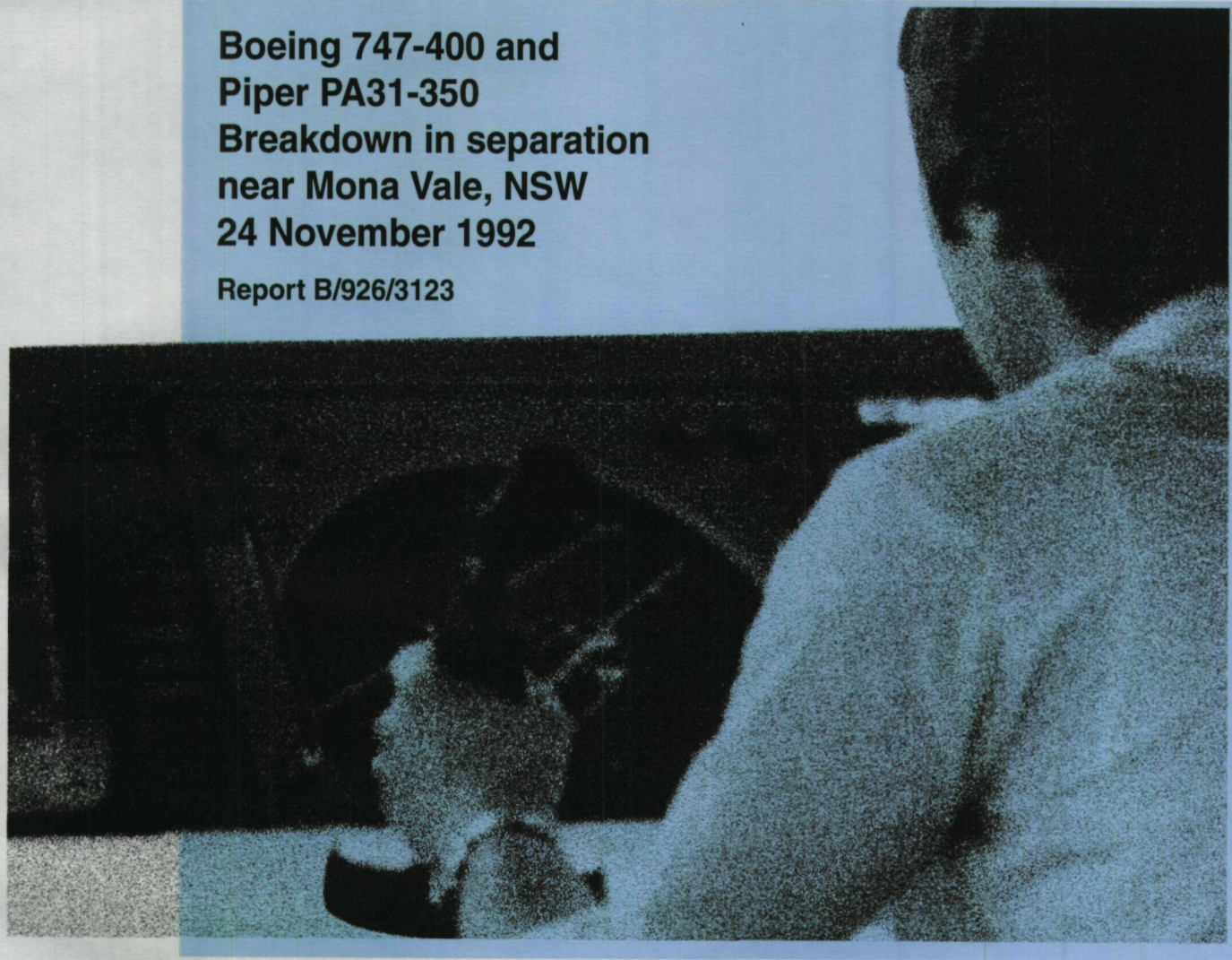
BUREAU OF AIR SAFETY INVESTIGATION
REPORT

Boeing 747-400 and Piper PA31-350 Breakdown in separation near Mona Vale, NSW 24 November 1992

Report B/926/3123



BASI
Bureau of Air Safety Investigation

Department of Transport

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INVESTIGATION REPORT
B/926/3123

Boeing 747-400 VH-OJG and Piper PA31-350 VH-WGG Breakdown in separation near Mona Vale, New South Wales 24 November 1992

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This report was produced by the Bureau of Air Safety Investigation (BASI), PO Box 967, Civic Square ACT 2608.

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Aircraft type	**Boeing B747-400**	**Piper PA31-350**
Registration	**VH-OJG**	**VH-WGG**
Nominated/apparent class of operation	**Scheduled International Passenger Service**	**Scheduled Passenger Service**
Degree of damage to aircraft	**Nil**	**Nil**
Location	**Near Mona Vale NSW 33° 52' S 151° 14' E**	
Date and time	**24 November 1992, 0727 hours***	
Departure point	**Los Angeles USA**	**Williamtown NSW**
Departure time	**Unknown**	**0703 hours**
Destination	**Sydney NSW**	**Canberra ACT**
Crew:	*Pilot in command*	*Pilot in command*
– Class of licence	**ATPL**	**CPL**
– Hours on type	**Not known**	**Not known**
– Total hours	**Not known**	**2,500 approx.**
– Degree of injury	**Nil**	**Nil**
Others persons involved:		
– On board aircraft	**Nil**	**Nil**
– ATS personnel	**Nil**	

*All times are Eastern Standard Summer Time which equates to Co-ordinated Universal Time + 11 hours.

1. FACTUAL INFORMATION

VH-WGG departed Williamtown at 0703 hours and proceeded to track via the 015 radial of the Sydney VOR at 8,000 ft. The pilot contacted the Sydney Departures North controller 28 NM from Sydney and the radar identification was passed to the Approach North controller, who raised a 'shrimp boat' (a small piece of plastic which adheres to the radar screen and allows the controller to write pertinent information on it for his/her reference) and placed it on the radar screen next to the radar return of VH-WGG. The shrimp boat was not positionally updated nor was it annotated to indicate to which aircraft it was referring.

When an aircraft passes overhead Sydney, its track impinges on all four sectors of approach/departures airspace and two flight progress strips (FPSs) are raised, one for approach use and one for departures. These FPSs are pink in colour to enable them to stand out from the other FPSs in use. The aircraft is identified by the controller in whose airspace it enters and the progress is then monitored by all four controllers by updating the position of their 'shrimp boats' on the radar screen and placing the pink FPS in the central (active) strip bay.

As the track of VH-WGG affected all four approach/departures controllers each pair had a pink strip for information purposes. In the case of the two approach controllers this strip should have been placed in the central sequence bay but, because of the number of arrival strips being processed in a busy sequence, this was not done and the strip was placed in the Approach South bay which was not immediately visible to the Approach North controller.

VH-OJG was radar-vectored by the Approach North controller for a left circuit to runway 16 and this track was observed by the Departures North controller, who decided to issue a reminder about the possible confliction. He decided to call out to the Approach North controller in lieu of using the direct intercom hotline that was available, and although two other controllers heard the call, the Approach North controller did not. VH-OJG was then given a left turn for base leg and during this phase, VH-OJG was turned onto a heading that placed it in conflict with VH-WGG. The approach controller realised the error and immediately attempted to remedy the situation by instructing VH-OJG to maintain 8,500 ft. As the aircraft was already passing 8,600 ft, the inertia was such that the descent was arrested at 7,950 ft before the aircraft was climbed back to the assigned altitude.

The crew of VH-OJG did not see the other aircraft and thought the controller had no urgency in his voice; otherwise they may have been able to arrest the descent earlier than they did when instructed to maintain 8,500 ft.

The pilot of VH-WGG saw VH-OJG as it turned onto the assigned heading and was concerned that the aircraft appeared to be converging. He could see that VH-OJG was turning in front of him at about the same level and queried the altitude with ATC. The departures controller had observed that a separation problem was imminent and gave VH-WGG descent before the pilot's enquiry was answered.

A review of the radar tapes showed that VH-WGG had not commenced descent prior to the point of closest proximity and that the two aircraft came within 1 NM with a vertical difference of 300 ft. The separation standard required is 3 NM or 1,000 ft.

The Approach North controller was experiencing a busy period of arriving air traffic. This involved numerous transmissions to provide a sequencing and separation service for the many aircraft under his control.

2. ANALYSIS

The Approach North controller was in a high-workload situation which required him to concentrate on his section of airspace. VH-OJG was arriving from the east and was being processed through Departures North airspace, which is a normal situation.

The Approach North controller was given the identification and placed the 'shrimp boat' on the radar screen but, in this instance, he forgot about VH-WGG when he vectored VH-OJG onto the base leg. This was partly because the 'shrimp boat' was not positionally updated and the return was not identifiable as an overflying aircraft.

In addition, the pink FPS was not in immediate view, as the approach controllers had decided to put the strip out of the way in order to concentrate on the arrival sequence and to make room for the appropriate arrival FPS.

The Departures North controller was monitoring events as the confliction was developing in his airspace. He expected the approach controller to radar vector VH-OJG clear of VH-WGG but, when he observed the downwind leg of VH-OJG, he decided to remind the approach controller of VH-WGG's presence just in case the other controller had forgotten. The Departures North controller issued the reminder by calling out across the room and did not use the 'hotline' facility that was available between the two positions. The approach controller did not hear the reminder call, and the opportunity to prevent the incident developing was lost.

3. CONCLUSIONS

3.1 Findings

1. ATS staff were correctly rated to perform their tasks.
2. All aircrew performed their functions in accordance with promulgated standards and procedures.
3. The Departures North controller provided the Approach North controller with sufficient information to provide the separation function.
4. The Approach North controller was experiencing a high level of workload.
5. The FPS for VH-WGG was not placed in the correct sequence bay.
6. The Approach North controller did not adequately update his radar display with reference to VH-WGG.
7. The Approach North controller temporarily forgot that VH-WGG was a confliction for VH-OJG.
8. The decision by the Departures North controller to issue a reminder of the confliction was sound practice, but the action was rendered ineffective because he did not use the 'hotline' to pass this reminder.
9. The Approach North controller vectored VH-OJG across the flight path of VH-WGG without ensuring that vertical separation existed.
10. The aircraft passed within 1 NM of each other with 300 ft vertical separation, thereby infringing the standard of 3 NM and 1,000 ft.
11. A breakdown of both vertical and horizontal separation standards occurred.

3.2 Significant Factors

The following factors were considered relevant to the development of the incident:

1. The radar return on the overflying aircraft did not stand out specifically from other aircraft being processed.
2. The Approach North controller did not update his display because of the heavy workload situation.
3. The pink FPS was not in the correct sequence bay and was not immediately visible to the Approach North controller.
4. A warning regarding the developing situation was not heard by the controller.

4. SAFETY ACTIONS

The Bureau of Air Safety Investigation recommends that the Civil Aviation Authority:

1. Allocate special code(s) for overflying aircraft, these codes should be more conspicuous and readily stand out from other radar returns on the radar screen, and
2. Increase the strip holding capacity of the sequence bays in the Sydney approach/departure radar consoles.

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BASI CONTACTS:

Adelaide
GPO Box 1112
Adelaide SA 5001
Telephone: (008)011 034
Facsimile: (08) 228 6808
12th Floor
Capita Building
10–20 Pultney Street
Adelaide SA

Brisbane
PO Box 10024
Brisbane Adelaide St
QLD 4000
Telephone: (008)011 034
Facsimile: (07)832 1386
Australia House
12th Floor
363 Adelaide Street
Brisbane QLD

Canberra (Central Office)
PO Box 967
Civic Square ACT 2608
Telephone: (008) 020 616
Facsimile: (06) 247 3117
24 Mort Street
Braddon ACT

Melbourne
Telephone: (008) 011 034
Facsimile: (03) 685 3611
2nd Floor Building 3
6 Riverside Quay
Southbank Vic. 3006

Perth
PO Box 63
Guildford WA 6055
Telephone: (008) 011 034
Facsimile:(09) 479 1550
Pastoral House
277–279 Great Eastern H'way
Belmont WA

Sydney
PO Box Q78
Queen Victoria Bldg NSW 2000
Telephone: (008) 011 034
Facsimile: (02) 283 1679
7th Floor
1 Market Street
Sydney NSW

CAIR
Reply Paid 22
The Manager
CAIR
PO Box 600
Civic Square ACT 2608
Telephone: (008) 020 505
24 Mort Street
Braddon ACT

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