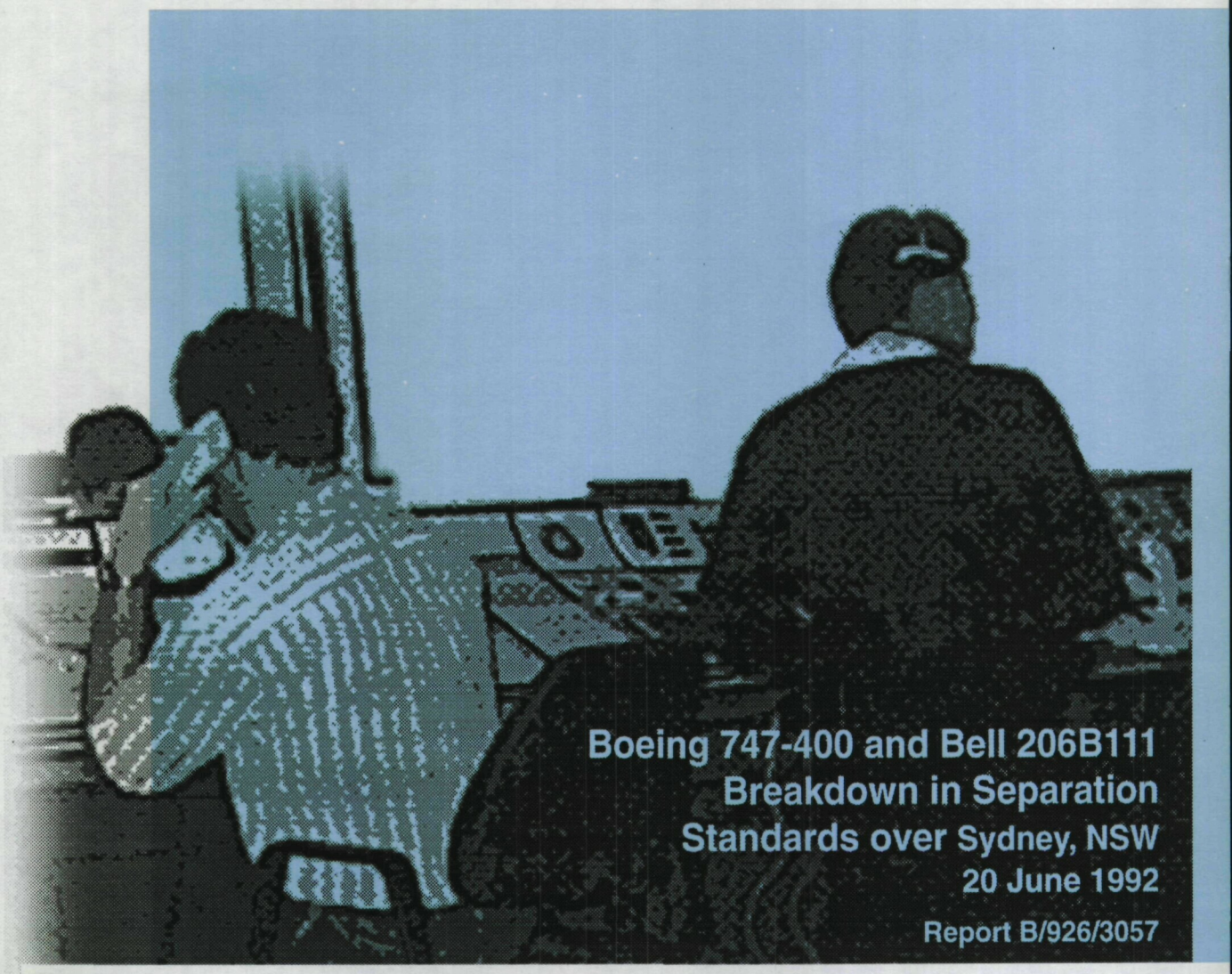
INVESTIGATION REPORT

BUREAU OF AIR SAFETY INVESTIGATION



Boeing 747-400 and Bell 206B111 Breakdown in Separation Standards over Sydney, NSW 20 June 1992

Report B/926/3057

BASI

Bureau of Air Safety Investigation

Transport and Communications

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Boeing 747-400 VH-OJO
and
Bell 206 B111 VH-BHU
Breakdown in Separation Standards over Sydney, New South Wales
20 June 1992

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Released by the Director of the Bureau of Air Safety Investigation under the provisions of Air Navigation Regulation 283

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

The Director of the Bureau authorised the investigation and the publication of this report pursuant to his delegated powers conferred by Air Navigation Regulations 278 and 283 respectively. Readers are advised that the Bureau investigates for the sole purpose of enhancing aviation safety. Consequently, Bureau reports are confined to matters of safety significance and may be misleading if used for any other purpose.

Aircraft type	**Boeing B747-400**	**Bell 206B111**
Registration	**VH-OJO**	**VH-BHU**
Nominated/apparent class of operation	**Scheduled International Passenger Service**	**Commercial – Photographic**
Registered operator	**Qantas**	**Helicopter Charter Pty Ltd**
Flight number	**QFA27**	**N/A**
Degree of damage to aircraft	**Nil**	**Nil**
Location	**Sydney NSW 33° 56' S 151° 10' E**	
Date and time	**20 June 1992, 1123hours**	
Departure point	**Sydney NSW**	**Sydney NSW**
Departure time	**1123 hours**	**1116 hours**
Destination	**Hong Kong**	**Sydney NSW**
Crew:	***Pilot in command***	***Pilot in command***
– Class of licence	**ATPL**	**CHL**
– Hours on type	**Not known**	**Not known**
– Total hours	**Not known**	**Not known**
– Degree of injury	**Nil**	**Nil**
Others persons involved:		
– Passengers	**Nil**	**Nil**
– ATS personnel	**Nil**	

All times are Eastern Standard Time which equates to Co-ordinated Universal Time + 10 h.

1. FACTUAL INFORMATION

The Boeing 747 (QFA 27) was cleared for takeoff from runway 16 on a Mudgee One Standard Instrument Departure (SID). This SID procedure required the aircraft to track via the 163 radial of the Sydney VOR (omni) to 3,000 ft and then turn left to track back towards the airfield, passing overhead the Sydney VOR prior to setting course in a north-westerly direction. The VOR navigational aid is located on Sydney Airport and the SID required the B747 to be at 5,000 ft or higher before passing the VOR. Sydney Air Traffic Control had cleared the aircraft to climb to its initial cruising level, flight level (FL) 310.

The Bell 206 (VH-BHU) planned to climb overhead Sydney Airport to FL 125 for a photographic operation. The Sydney Aerodrome Controller (ADC) cleared the helicopter to climb to FL 125 within the lateral confines of an area between Qantas Maintenance facilities, located on the airport and the Sydney Hilton Hotel which is about 0.5 km west of the airport's northern boundary. Due to suppression of radar returns within 3.5 km of the radar head, which is also located on the airport, the flight path of the helicopter was not detected on any ATC radar screen.

Approaching 5,000 ft, the helicopter pilot saw the B747 approaching from his 5-o'clock position at about the same height. He immediately took evasive action by turning his aircraft to the left. The crew of the B747 observed the helicopter's action and decided to maintain their track as it would take them safely clear of the helicopter. The aircraft passed within 600 m of each other at approximately the same height.

There are two aerodrome control positions in Sydney Tower—ADC 1 and ADC 2. At the time of the incident, these positions were combined for training purposes. The person performing the ADC function was engaged on his first day of training and was under the direct supervision of a rated training officer. He had commenced duty at 0600 hours with the morning shift. When the day shift commenced at approximately 1100 hours, the Senior Tower Controller suggested that the officer under training remain on duty under the supervision of a different training officer. The morning training officer went off shift and was replaced by a rated officer who had arrived at the Tower not expecting to perform the training task. Nevertheless, when the Senior Tower Controller asked him to take on the training responsibilities, he agreed.

Although the Tower generally 'owns' no airspace, it does have local instructions that authorise the use of several 'Kopter' routes. Two of these routes, Kopter 8 and Kopter 9, place a limited portion of airspace under the direct control of the Tower and it is normal practice for the ADC to clear a helicopter to become airborne in readiness for departure, whether using one of these Kopter routes or not.

The rated officer had taken over the training responsibilities some 12 min prior to the occurrence and had commenced duty approximately 10 min before that. Although monitoring the Bell 206 with other airport traffic during this period, the rated officer did not immediately realise the altitude to which the helicopter was climbing and had forgotten about the B747 tracking via the Mudgee 1 SID. He was also uncertain as to what co-ordination the trainee had carried out. The training officer was in the process of checking that the trainee had indeed performed all the necessary actions when he realised the situation and co-ordinated with Approach/Departures Control to establish vertical separation. The aircraft passed before this separation could be achieved.

The type of helicopter operation being undertaken required full co-ordination with Approach/Departures as the aircraft would not be visible to the radar controllers during its climb. This co-ordination was not carried out.

2. ANALYSIS

Radar

The 3.5-km gate in which radar returns are not displayed for controller reference is designed to avoid the clutter of information which can occur when many aircraft are in close proximity to each other such as on and near airports. If this clutter was allowed to appear, during busy periods, it would obscure an area of several miles around Sydney and render that area useless for ATC radar-separation purposes.

Helicopter operations at Sydney

While on this occasion the helicopter was not operating on a Kopter route, the ADCs instructed it to become airborne using normal visual separation methods. This was because they had become used to getting helicopters airborne to depart on these routes or to place the helicopter in an advantageous position so that when a departure clearance was obtained from radar control, the aircraft could quickly and easily depart with a minimum of disruption to other traffic.

As the helicopter was not intending to use a Kopter route, full co-ordination with the Approach/Departures cell was required. The ADC (under training) instructed the pilot to manoeuvre the helicopter to the Qantas Maintenance Area (a suitable position clear of runway operations from which a departure would have minimal disruptive effect) and then cleared it for takeoff without this co-ordination.

VH-BHU had planned to climb to FL 125. This is an unusually high altitude for helicopters to operate at in the vicinity of Sydney Airport. It is estimated that the vast majority of helicopter movements at Sydney would normally initially depart to, or arrive from, an altitude of 3,000 ft or less.

Aircrew

QFA27 – The crew first saw the helicopter as they approached the overhead Sydney position whilst climbing through 5,700 ft. They did not take any evasive action as they were able to monitor the aircraft at all times and were confident that the helicopter was going to pass to the left-hand side. This judgement was based on the constant relative position of the helicopter and the fact that they saw the aircraft make a positive movement away from the direction of their flight path.

VH-BHU – The helicopter was being flown single-pilot. When the pilot saw the B747 in his 5-o'clock position he took immediate action to increase the distance between the aircraft. Wake turbulence became his main concern and the pilot ensured the maximum lateral distance was achieved in the time available by tracking 90° from the assumed flight path of the B747.

ATC Personnel

The ADC under training was on his first training shift and was unfamiliar with many of the ADC functions. He was concentrating on getting his flight-strip notation correct and needed to be prompted by the rated officer at almost every action or transmission. Because of his inexperience he did not realise that the level proposed for the helicopter was unusual and cleared VH-BHU for takeoff just as he had cleared several other helicopters during the shift.

The trainee had been assigned to a training officer who was not on duty that day. This often happens when a controller changes from one roster to another—it may take a few days to meld the day-off requirements of both officers. He commenced duty at 0600 hours and was assigned to one of the rostered ADCs for training for that day only. This officer supervised the training in a normal manner until the change of shift at approximately 1100 hours. At this time the Senior Tower Controller decided that the day-shift ADC would be assigned the training task and a

hand-over/take-over was carried out between the two rated ADCs. The trainee stepped down for the 7–8 min that it took to complete the hand-over/take-over and then stepped back to perform the ADC function under the supervision of the day-shift ADC. This put the time at approximately 1112–1114. It was then decided that as the traffic was light, it would be beneficial to have the two ADC positions on combine for training purposes. This is a valid situation and sometimes necessary in order to give trainees a fair and comprehensive training session.

The rated ADC had been expecting to perform the ADC function himself and had been looking forward to this responsibility. When he was asked to assume the role of training officer, he reluctantly agreed.

The new training officer soon realised the trainee's limitations and was assessing the corrective action necessary when VH-BHU and QFA27 taxied for departure. While the training officer was considering the appropriate action in the light of the traffic situation and the trainee's limitations, the trainee cleared VH-BHU for takeoff without realising the co-ordination that was required.

3. CONCLUSIONS

Findings

1. The crews of both aircraft operated in accordance with ATC instructions.
2. The officer performing the ADC function did not realise the significance of the helicopter's operating altitude.
3. The ADC (training officer) was not fully aware of the clearance given to VH-BHU.
4. The Approach/Departures Controllers were not aware of the presence of VH-BHU until the confliction had occurred.
5. The radar had a 3.5-km gate in place which precluded the radar controllers from observing the approaching confliction.
6. The ADC [training officer] was not mentally attuned to the training responsibilities at the time of commencing the training task.
7. The Senior Tower Controller allowed the change of training officer to occur during the course of a training shift.

Significant Factors

1. The ADC (trainee) cleared VH-BHU for takeoff without the necessary co-ordination.
2. The training officer did not adequately monitor the actions of the controller under training.
3. The training officer did not have time to adequately assess the trainee's ability prior to the occurrence.

4. SAFETY RECOMMENDATIONS

That the Civil Aviation Authority introduce trainee/trainer rostering principles for ATS to ensure that:

(i) A training officer will not commence on-the-job training of a trainee unless a briefing of the training requirements has been conducted remote from the control console.

(ii) A trainee having been briefed by a training officer will, apart from short comfort breaks remain under that officer's supervision for the duration of the training shift.

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