

**Aviation Safety Investigation Report
199500058**

**Boeing Co
B737**

10 January 1995

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NOTE: All air safety occurrences reported to the ATSB are categorised and recorded. For a detailed explanation on Category definitions please refer to the ATSB website at www.atsb.gov.au.

The Bureau did not conduct an on scene investigation of this occurrence. The information presented below was obtained from information supplied to the Bureau.

Occurrence Number: 199500058 **Occurrence Type:** Incident
Location: Coolangatta
State: QLD **Inv Category:** 4
Date: Tuesday 10 January 1995
Time: 1000 hours **Time Zone** EST
Highest Injury Level: Minor

Aircraft Manufacturer: Boeing Co
Aircraft Model: 737-377
Aircraft Registration: VH-CZE **Serial Number:** 23657

Type of Operation: Air Transport Domestic High Capacity Passenger
Scheduled
Damage to Aircraft: Nil
Departure Point: Sydney NSW
Departure Time:
Destination: Coolangatta QLD

Crew Details:

Role	Class of Licence	Hours on	
		Type	Total
Pilot-In-Command		4819.0	11950
Pilot-In-Command (AICUS)		294.0	5500

Approved for Release: Friday, May 5, 1995

On 10.1.95 VH-CZE was landed firmly at Coolangatta. The aircraft was being flown by a captain under training in the left seat. There was a training captain in the right seat and a first officer in the jump seat. After the landing the purser and the number 4 flight attendant (FA), both of whom were sitting in the forward cabin crew seats, reported sore backs/necks.

Because of these reports, the training captain requested engineering personnel to carry out a heavy landing check of the aircraft. The check revealed no damage and the aircraft was returned to service. The training captain said he would not have considered a heavy landing check had the two cabin crew members not complained of sore backs/necks. A DFDR readout showed the maximum vertical G at touchdown was 2.022Gs. A normal landing is about 1.3Gs.

The crew reported that they joined the circuit on a visual downwind for runway 14 and were established on final approach at about 900 feet. The approach was being flown manually with the auto-throttle engaged. The aircraft was stabilised on the VASI and on approach speed. On short final the speed dropped a little but auto-throttle compensated and picked it up. Closer in, the speed dropped again and at that point auto-throttle closed (auto-throttle closes at 27 feet on the radar altimeter). Speed then dropped further but auto-throttle was now closed and therefore did not compensate. Both pilots pulled back on the control column but the main gears touched down very firmly.

At touchdown the aircraft was in an almost normal touchdown attitude. This was only the second auto-throttle landing (ie manually flown with auto-throttle engaged) that the flying pilot had done in the aircraft type. He had previous experience on the same aircraft type, with another operator, where this was not the practice. Since he had commenced flying with this operator, he had done six auto-throttle landings in the simulator and one in the aircraft, which was the landing prior to the landing at Coolangatta.

He believed he simply got caught with the speed low and then the auto-throttle closing at a critical stage.

Both pilots said conditions were more difficult on the previous landing and also for the next two landings after the Coolangatta landing but the flying pilot made good auto-throttle landings on each of those occasions. The speed decay experienced on this landing was consistent with encountering mild windshear and this was evident in the DFDR readout.

Aviation medicine specialists were engaged in this investigation to assess the circumstances of the flight attendant injuries. An ergonomic assessment was made of the rear facing seats and their harnesses. The seats were assessed as providing no protection for vertical G forces. However, they also noted that the maximum G force involved in this occurrence should be tolerable with no ill effects if the correct seating posture is assumed. The restraint (harness) system installation for these seats was assessed as making optimum posture difficult to assume because of the position of the upper anchor points of the shoulder belts.

Factors

The following factors were considered relevant to the development of this occurrence:

1. The pilot flying lacked experience in the landing procedure using auto-throttle.
 2. Late on final approach, the auto-throttle closed when airspeed was below target speed and reducing.
 3. When the auto-throttle closed it was probably too late to correct the situation with power so both pilots pulled back on the control column but this did not stop the aircraft touching down firmly.
 4. Mild windshear contributed to the loss of airspeed.
 5. The design of the forward flight attendant seats and restraint harness probably contributed to the minor injuries sustained by the flight attendants.
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