ACCIDENT

Aircraft Type and Registration:	Boeing 757-200, TF-ARE
No. and Types of Engines	2 Rolls Royce RB211-534E4-37 turbofan engines
Year of Manufacture	2005
Date & Time (UTC):	11 June 2005 at 2030 hrs
Location:	Manchester International Airport
Type of Flight:	Public Transport (Passenger)
Persons on Board:	Crew - 8 Passengers - None
Injuries:	Crew - 1 Passengers - None
Nature of Damage:	None
Commander's Licence:	Airline Transport Pilot's Licence
Commander's age:	N/A
Commander's Flying Experience:	Last 90 days - N/A Last 28 days - N/A
Information Source:	Aircraft Accident Report Form, Airline internal investigation and AAIB inquiries

Synopsis

Whilst closing the R4 door prior to departure, a cabin crew member trapped her left forearm between the door assist handle and aircraft bulkhead, causing her wrist to fracture in three places. Two safety recommendations were made.

History of occurrence

Cabin crew member's recollection

The aircraft was preparing for a charter flight from Manchester to Antalya but had been delayed by approximately five hours due to its late arrival from London Gatwick Airport. During the pre-boarding checks the cabin crew member adjacent to the R4 door, who had three months experience on type and who was dealing with the catering, noticed the door, through which the caterers had just left the aircraft, begin to move and assumed that it was being pushed closed from the outside. Although the door then stopped moving, she decided to close and lock the door in order to protect herself from any further uncommanded movement. She positioned herself in the normal manner close to the door with her left hand on the door assist handle and her right hand on the locking handle. However, the door then started to move quickly, trapping her left arm between the bulkhead and door assist handle. The attendant believed that the door was being pushed from the outside and, therefore, screamed and shouted for the person outside to stop. Despite her efforts, the door continued to close forcing

her left hand to bend around the door assist handle and her wrist to fracture. Figure 1 shows a reconstruction of how a person's arm may become trapped. It was only once the door had moved into the fully closed position that the attendant was able to free her arm. Paramedics treated her at the aircraft before she was taken to hospital by the Duty Station Officer.

Caterer's recollections

The caterer was nearing the end of his shift and had been working on the aircraft for approximately 25 minutes before leaving through the R4 door. He retracted and lowered the bridge on the catering truck until the safety rails were clear of the door, reached up and, with relatively little force, moved the door to the half closed position before driving the catering vehicle away from the aircraft. At no time did the caterer hear the attendant shouting or screaming. He later stated that it is not unusual for the cabin attendants to struggle when closing aircraft doors and it has become a common courtesy for catering staff to help by pushing on the bottom of the door until the door is in the half closed position. The caterer stated that they are not allowed to close aircraft doors and, therefore, always ask the attendants if they require any assistance before helping. The doors will only move once the attendant has disengaged the gust lock. On this occasion, he could not recall if he had asked the attendant if she required any help but, as the door moved, he assumed the gust lock had been disengaged; moreover, from his position on the catering vehicle bridge he could see the attendant closing the door in the normal manner. The caterer only became aware two weeks later of what had happened.

There were no other witnesses to the incident.

Weather

The METAR for the period covering the incident reported the wind as 120°/3 kt.

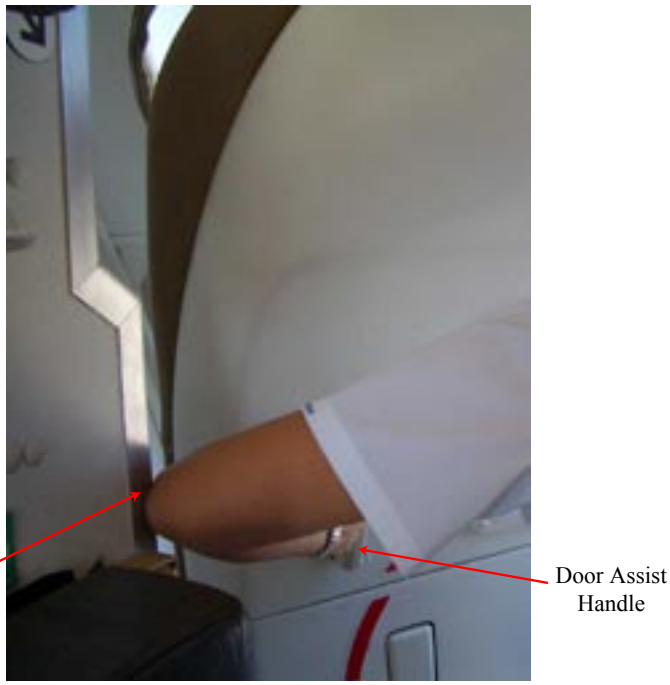

Figure 1

Reconstruction of a cabin crew member's arm trapped between bulkhead and door assist handle

Aircraft door operation

The doors on the Boeing 757-200 aircraft are heavy and it can be difficult for inexperienced and slightly built cabin crew members to overcome a door's inertia when moving it away from the fully open position. Once the door is moving, however, its momentum will allow it to continue to close at a steady rate until, in the final phase of the closure sequence, the rate at which the door closes appears to increase. Wind pressure, or external assistance, can affect this closure rate. The door gust lock engages automatically when the door is moved to the fully open position and must be manually disengaged before the door can be closed. As part of her training, the cabin crew member involved in this accident had been assessed on her ability to close cabin doors, using a cabin simulator equipped with doors that are lighter than the doors fitted to the aircraft. The simulator does not reproduce the effect of wind loading on doors. It is understood that the potential to fall from the aircraft when closing cabin doors on the Boeing 757-200 can, at times, cause concern to many cabin crew members. It is, therefore, not surprising that cabin crew on a number of airlines, seek help from ground staff, particularly when the cabin floor is wet or there is a strong wind blowing against the open door.

Another major operator of the Boeing 757 advises its cabin crews that, if they experience a problem closing the doors, then they should seek assistance from ground staff. They do, however, emphasise that it is the responsibility of the cabin attendant to retain control of the operation.

Discussion

The flight had been delayed and the cabin crew were preparing the aircraft prior to boarding the passengers. Knowing that the aircraft was late, it is possible that, as the caterer left the aircraft, he asked the attendant if she needed help in closing the door, but she did not hear him above the general noise in the area. Once the bridge on the vehicle had been lowered, the caterer saw the attendant standing by the door and, as it moved, he assumed that she had removed the gust lock and had accepted his offer of help. Once the door was in the half closed position, the caterer left the attendant to finish the task. At this stage, the cabin attendant had positioned herself to close the door and it is possible that its momentum was sufficient to cause her to lose control of it. The attendant does not recall disengaging the door gust lock and, therefore, it is possible that the lock had not fully engaged when the door was moved to the fully open position.

Other airlines inform their cabin crews that if they experience difficulty in closing a door then they should seek assistance from ground staff, with the proviso that they remain in control of the situation. Unfortunately, on this occasion there was a breakdown in communication between the two individuals concerned such that the relatively inexperienced cabin crew member found herself having to quickly position herself in a confined space in order to close the door. It is possible that in quickly changing tasks, she was not mentally prepared, or correctly positioned, to handle the heavy door. The fact that she said the door stopped moving is consistent with the caterer's account that he left the door half open and it is probable that, on this occasion, it was the normal momentum of the door which exerted sufficient force to break her wrist.

Since the accident the airline concerned has issued the following instruction to its cabin crew:

'The opening and closing of an aircraft door when cabin crew are on board lies solely with the crew member assigned to a specific door. The crew member should make it very clear to any third party that the crew member alone will open/close the door when steps/hi-loaders are moved away'.

Safety Recommendations

It has been reported that the closing of cabin doors on the Boeing 757-200 can, at times, cause concern amongst those members of staff authorised to perform this action. It is, therefore, not surprising that cabin attendants in a number of airlines seek help from the ground staff, particularly when the cabin floor is wet, or if there is a strong wing blowing against the open door. The recent instruction issued by the operator to their cabin crews would now seem to preclude an attendant from seeking assistance when a door is difficult to close. This may now put such an attendant in a position of unnecessary risk of injury or falling from the aircraft. Therefore, the following safety recommendation was made.

Safety Recommendation 2005-133

It is recommended that Excel Airways reviews its procedures for the closing of cabin doors, to reflect the fact that there are occasions when cabin attendants may require assistance from ground staff.

In response to this recommendation, the operator has now incorporated the instruction previously issued directly to cabin crew into their Company Operations Manual, Part E (SEPs) Chapter 2, Page 8. In addition, the instruction has been expanded to encompass any requirement for additional assistance, as follows:

'Any additional assistance to help with the closing of aircraft cabin doors must be obtained from another cabin crew member on board.'

Whilst the cabin door on the Boeing 757-200 cabin simulator, used by the operator, physically resembles the cabin doors on the aircraft, it is considerably lighter than those fitted to the aircraft and, therefore, the force required to move and control the door is not representative. Additionally, no provision is made to simulate the effect of wind loading on the door. The following safety recommendation was therefore made:

Safety Recommendation 2005-134

It is recommended that Excel Airways reviews its training with respect to the operation of Boeing 757-200 cabin doors, to ensure that the final assessment of any authorised individual's capability to operate a cabin door safely is carried out on an aircraft under representative conditions.

In response to this recommendation, the operator has stated that representative training is now being carried out on board each Excel Airways aircraft type before cabin crew are signed off as qualified and authorised to operate cabin doors unsupervised.

INCIDENT

Aircraft Type and Registration:	Boeing 757-236, G-BMRE
No & Type of Engines:	2 Rolls-Royce RB211-535C-37 turbofan engines
Year of Manufacture:	1988
Date & Time (UTC):	30 July 2005 at 0819 hrs
Location:	Nottingham East Midlands Airport, Derbyshire
Type of Flight:	Training
Persons on Board:	Crew - 4 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Damage to No 3 wheel and brake assemblies
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	58 years
Commander's Flying Experience:	18,000 hours (of which 8,000 were on type) Last 90 days - 30 hours Last 28 days - 14 hours
Information Source:	Operator's Safety Department Investigation Report and Aircraft Accident Report Form submitted by Operator's Flight Safety Officer

Synopsis

The aircraft had been positioned at Nottingham East Midlands Airport early in the morning of 30 July 2005, following which various maintenance activities took place, including changing the No 3 wheel brake unit. The aircraft subsequently took off to fly training circuits but, on the second touch-and-go, the Control Tower advised the crew that flames were seen to be coming from the right main landing gear. The commander elected to continue the touch-and-go and to fly a circuit with the landing gear down, as he was concerned about stopping the aircraft in the runway distance remaining. After a successful landing, the aircraft was brought to a stop on the runway and inspected by the fire service, prior to being towed to a stand.

The fire was later attributed to a failure in the No 3 brake unit. This was caused by the end cap of the brake torque rod not being refitted during the maintenance activity, thus allowing one end of the brake torque rod to become detached and scrape along the ground during the landing. The brake unit rotated with the wheel during the rollout, causing damage to the wheel, severance of the brake hose and damage to the brake temperature monitoring components.

History of flight

The aircraft had been positioned at Nottingham East Midlands Airport at 0157 hrs on the morning of the incident, following which various maintenance activities