

AAIU Report No. 1999/023
AAIU File No. 19990004
Published. 5/01/2000

Aircraft Type and Registration: B737-200 EI-CKP

Date and Time (UTC): 22 Jan 1999 16.07 hrs

Location: Stand 9 Dublin Airport

Type of Flight: Public Transport

Persons on Board: Crew - 5 Pax - 131 (Infant - 1)

Injuries: Crew - None Pax - None
Ground Operator - One

Nature of Damage: None

Commanders Licence: ATPL

Commanders Age: 46 years

Commanders Flying Experience: 10,500 hrs

Information Source: ATC Watch Manager, Dublin Airport,
AAIU Field Investigation

Synopsis

At approximately 16.07, EI-CKP commenced push-back from Stand 9 at Dublin Airport. The push-back crew consisted of a tug driver, a wing-man and a headsetman. The push-back proceeded normally until the tug made a right-hand turn at the taxi-line. At this point the front-right wheel of the tug passed over the headsetman's feet.

The Headsetman attempted to continue the pushback, but collapsed on to the ramp and the Airport Police Ambulance crew were called. He was taken to Beaumont Hospital. He had sustained a broken left leg and several broken bones in his right foot and was detained for 4 days.

1. Factual Information

1.1 History of the Accident

At the time of the accident there was construction work taking place on the central apron opposite Stand 9 which necessitated that the push-back crew be extra vigilant when turning the aircraft.

Push-back ground crew on Stand 9 engaged in the dispatch of the aircraft were

- (a) Team leader or Ramp Dispatcher
- (b) Tug Driver
- (c) Wing-man
- (d) Head-set man
- (e) Aircraft Engineer

The above personnel were under the control of the Ramp Co-ordinator, who at the time of the incident was at the Operators Dispatch Office. The Ramp Co-ordinator is not required to be at the stand on aircraft departure.

At approximately 16.07 EI-CKP commenced push-back from Stand 9. The tug driver manoeuvred the tug straight back along the yellow taxiline with the Wingman at the starboard wing to his left and the Headsetman at the port wing to his right. As the steering wheel of the tug was on the Left Hand Side (LHS) the driver was nearer to the Wingman than to the Headsetman. The Headsetman was in audio contact with the Captain of the aircraft through his headset during pushback. The operator's policy is that the pushback crew are in eye contact with one another and use hand signals.

When the aircraft was back as far as the red taxiway boundary line the tug driver manoeuvred his vehicle towards the No. 1 engine in order to start the aircraft turn. He locked the front wheels to the right. At this point the Headsetman was now standing beside the tug. When the tug was powered forward, the right front wheel passed over the Headset-man's feet. The left foot caught first and, as he lurched to the right, the wheel caught his right foot.

The Tug Driver, feeling the bump and noticing the disappearance of the Headsetman, stopped his vehicle. Meanwhile, the Headsetman attempted to continue his duties but quickly collapsed on the ramp. The Tug Driver got out to find the Headsetman on the ground in great pain. The Captain of the aircraft who did not witness the actual incident observed the Headsetman on the ground when the tug stopped. He requested the Tower Ground Controller to send an ambulance from the fire station.

Meanwhile the Engineer, who had seen the Headsetman on the ground ran over to give assistance. The Ramp Dispatcher got into the Engineer's car and contacted the Operator Crew Station to also request an ambulance. He then drove over to the scene to give assistance.

The ambulance arrived and its crew attended to the injured crewman. He then advised the operator staff to continue with the pushback of the aircraft and requested them to contact ATC to temporarily close down Stand 9 area. The Ramp Dispatcher then donned the headset and took over the duties of the Headsetman.

An airport police officer arrived at the scene at 16.20 hrs. At this stage the aircraft was being pushed back and was 200 metres from the accident site. The aircraft was then dispatched in the normal way.

1.1.1. Ground Crew Reports & Recollections

Personnel engaged in the dispatch of the aircraft who were on Stand 9 at the date and time in question completed company Accident/Incident Reports and were interviewed over several days following the accident. The Ramp Co-ordinator stated that he was in his office making out rosters when he received a call from the Operator Crew Station at 16.15 hours informing him of the accident. He arrived at the scene at 16.18 hours. He found the Headsetman on the ground in a state of shock with marks on his boots apparently left when the tug wheel ran over them.

At a subsequent interview he indicated that Stand 8,9 & 10 were normally very restricted due to the bend in the taxiway boundary line at this point. Since the construction of new stands opposite, during which cement mixers, dumpers and trucks visited the works on a regular basis, it was most important that extra caution be exercised by the ground crew during push back. As a result of the construction it would be necessary to turn the aircraft earlier to avoid the temporary railings surrounding the site. He reported weather conditions as "dry and sunny".

The Wingman stated that because of the construction nearest to the starboard wingtip on the turn, it was necessary to keep looking in that direction to be ready to give signals to the tug driver. He did not therefore witness the injury to the Headsetman. He reported the weather conditions as being "nice".

The Headsetman (the injured) said that at the time of the accident he was wearing the company's bright yellow uniform and steel-toe-capped boots. He indicated that he was watching out for activity which might endanger the tug and aircraft when a movement caught his eye on the right. The report, which was signed by him, states that he looked in that direction and momentarily stopped, and with that, the tug wheel went over his left foot, pushing him towards the right, his right foot shot out and the wheel went over the side of his right foot. He sustained two broken bones, fifth right metatarsal and lower third left fibula and bruising on both feet. At a subsequent interview he said that following the accident he suffered nightmares and depression and was receiving counselling. He reported the weather conditions as "dry".

He said that because he had a headset on at the time of the incident he could not hear trucks or tugs in the vicinity of the accident.

The Ramp Dispatcher reported that the weather conditions at the time of the accident were "Dry and Bright". He was speaking to the engineer following the commencement of the pushback when his attention was drawn to the fact that the Headsetman had fallen to the ground. Following the arrival of the ambulance he assumed the roll of the headsetman in dispatching the aircraft.

The Tug Driver reported that the weather conditions were "cold and dry" when he was engaged in the pushback. He said that as the aircraft reached the taxiline and he had started to turn the aircraft the Headsetman was beside the tug and when he locked the steering wheel hard over the right front wheel went over his foot. He felt the bump, stopped the vehicle, got out and saw the Headsetman on the ground.

1.1.2 Personal Protective Equipment and Clothing

The Headsetman was wearing the standard issue steel toe-cap boots and high visibility vest.

1.2 Injuries to persons

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Others</i>
<i>Fatal</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
<i>Serious</i>	<i>Nil</i>	<i>Nil</i>	<i>1</i>
<i>None</i>	<i>5</i>	<i>131</i>	<i>Nil</i>

1.3 Personnel Information

1.3.1 Ramp Staff Recruitment

The Headsetman joined the Operator on 6/7/98. His 3 month contract expired in October 1998. Prior to 1/11/98 all ramp staff were employees of the operator. After that date the operator released some of the Ground Handling Agents (GHA's) to the employment of a recruitment agency but they continued to work for the Operator. More senior staff with longer experience continued as employees of the Operator.

1.3.2 Training & Training Records

Copies of the following document were made available to the AAIU:

- (a) Details of Ramp Training Course
- (b) Certificates of Training for each pushback crew member

The Ramp Training Course booklet details the rules and regulations governing those who work on the ramp. It includes details of marshalling signals when guiding aircraft to and from the stand. It also states that "all staff will undergo a safe manual handling course".

No detailed syllabus of training for a tug driver wingman or headsetman setting out the type of instruction (class/practical) or subject hours was available. An 18 day syllabus of training for tugdrivers was available and a copy given to the Investigator.

Certificates of training were available for the tug driver and wingman in the following areas

- Ramp Safety Course
- Vehicles
- Safe Manual Handling

Certificates of training were available for the Headsetman in the following areas:

- Ramp Safety Course
- Safe Manual Handling

The Headsetman, who was 27 years of age at the time of the accident, on being interviewed, said that he had been a barman by trade and had no experience of baggage handling prior to becoming an employee of the Operator.

He said he received one-half days training on his first day at the airport and this consisted of being shown around the areas where he would be working. He progressed within a week from baggage handling in the hall to handling baggage on and off aircraft, bringing steps to the aircraft and participating with the tug in pushing the aircraft out.

He said that he had never been given a list of rules or safety guidance. The only warning he was given was to keep away from an aircraft when its beacon light was flashing. He had never seen a safety video which he said his colleagues had seen.

There was no training given by the recruitment agency on his becoming a employee of that agency. He said that he was never at any time given a course in Safe Manual Handling. He had signed statements on 7/7/98, a day after he took up employment with the operator, to say that he had successfully completed a "Ramp Safety Course" and a "Safe Manual Handling Course" He indicated that he probably signed these so that he would be retained as an employee of the Operator.

The Operator said that at the time the Headsetman joined, the standard training programme consisted of a 3 day course. Safe Manual Handling was scheduled on the afternoon of the first day of that course.

The Operator also stated that the Headsetman was given theoretical instruction in the Ramp Safety Course on the afternoon of 6/07/98 and that Safe Manual Handling was an integral part of that course. The Headsetman had signed off both the Ramp Safety Course and the Safe Manual Handling Course on 7/07/98.

It was normal, the Operator stated, that students would undergo a minimum of two days practical observation and monitoring under supervision. After completion of induction training, candidates are assigned to crews under the supervision of the Ramp Co-ordinator. The Operator emphasised that the initial "Ramp Training Course" was but a module of a more comprehensive programme.

1.4 Aerodrome Information

1.4.1 Apron and Stand details

Stand 9 at Dublin Airport requires that aircraft on push-back should negotiate an acute right hand turn once past the red taxiway boundary line and any adjacent aircraft parked on Stand 8.

Aircraft on Stand 9 are pushed back with the nose wheel of the aircraft along the yellow taxi-line. When the tail of the aircraft reaches the red taxiway boundary line, extra caution is required as the aircraft is now on the continuation of taxiway J1.

The airport police report states that the weather conditions were good and that the lighting was also good. The condition of the surface area contained "no oil or stones and was all clear".

1.4.2 The Safe Area

The Operator stated that it was common practice and standard operating procedure for the headsetman to position himself so that he is in visual contact with both the Captain of the aircraft and the tug-driver at all times. By doing this he would automatically place himself in an area where the tug cannot manoeuvre into without snapping the pins on the nose-wheel under-carriage.

1.5 Additional Information

1.5.1 Health and Safety Authority (HSA)

The body with overall responsibility for ensuring health and safety in the Irish work place is the Health and Safety Authority (HSA). As a state sponsored body it monitors compliance with legislation and can take enforcement action including prosecutions.

The most recent items of legislation are, the Safety, Health and Welfare at work (General Application) Regulations 1993 and Safety, Health and Welfare at Work (Miscellaneous Welfare Provisions) Regulation 1995. The principle legislation is the Safety Health and Welfare at Work Act, 1989.

While the HSA does not as a rule become involved in the regulation of aircraft operations in view of the IAA responsibilities in this area, they would be concerned that any other persons employed incidental to the operation of an aircraft should have the full protection of the type of provisions provided for in the safety and health legislation. These provisions include the very important accident prevention concepts of identifying hazards, assessing risks, having in place a consultative mechanism and effective control measures.

In line with the operators Health and Safety policy, an internal investigation was carried out into the accident. A report was made to the HSA dated 25/1/99 standard Form No. IR1 in which it was stated that the action leading to the injury was that the Headsetman "and the tug closed on each other - a safe distance was not maintained".

A more detailed report from the operators Health & Safety Officer dated 28/11/99 was forwarded to HSA. The conclusions of this report were:

- (a) Day light was fading rapidly and this may have caused some difficulty to the crew as they adjusted to the changing visibility (not major contributor).
- (b) Stand 9 is a difficult stand to push-back from as it requires the tug driver to make a severe right turn as soon as the aircraft has been pushed clear of the aircraft on Stand 8.
- (c) The factor which contributed most to the accident was the failure of the tug driver and the Headsetman to maintain visual contact with each other.

The report made emphasis on the fact that the importance of maintaining visual contact is documented in the procedural training which the tug driver and Headsetman received.

Copies of the following were made available to the AAIU:

- (a) Health & Safety Form No. IR1
- (b) Operators Health & Safety report
- (c) Operators Safety Statement
- (d) Safety Memo issued to staff 28/1/99
- (e) Crew members reports on the accident

2. Analysis

On the date and time in question several factors combined to cause this accident to take place.

The commencement of the pushback was normal with the tug and the three pushback crew pushing the aircraft at a walking pace.

When the aircraft reached the red taxiway boundary line the tug driver started to turn the aircraft. The Wingman was positioned on the tug drivers left.

As the starboard wing was now protruding out into the taxiway the Wingman's attention was focused on the wing tip and the railings surrounding the construction of new stands. He therefore did not witness the accident.

The Headsetman was in contact with the pilot during the initial stages of the pushback. As the aircraft turn commenced the tug was automatically brought nearer to the No. 1 engine and therefore nearer to the Headsetman. At this stage something on the far right of the tug caught the attention of the Headsetman. As the rest of the pushback crew and the tug/aircraft combination were moving forward, and along with it the "safe area", the Headsetman involuntarily moved outside this area. He was then struck by the right hand wheel of the tug as the driver locked hard over for the aircraft turn.

As the wheel of the tug passed over his left lower foot, he lost his balance and his right foot went forward and the wheel went over that one also.

A contributory factor to the accident was the size of the two front wheels of the tug which, because of the traction needed to push an aircraft, are large in diameter and the tug offers little protection to a person standing near the vehicle. Also, the steering wheel is on the left hand side of the vehicle furthest away from the Headsetman. If the headsetman is low in stature he could be hidden from view once outside his safe area. It is stated Operator policy that the tug driver be aware of the position of the wingmen at all times and that both wingmen be aware of the tug position at all times. Clearly, the Tug Driver and Headsetman did not maintain this eye contact.

The training which the Headsetman received did not appear to have been adequate for the job. This employee had been a barman for a number of years and had absolutely no experience of working in the aviation field. Working on the airside of a busy international airport in a hectic environment requires specific experience and skills. It demands that a new employee who has never worked in this environment receives adequate prolonged training.

The copy of the "Ramp Training Course" received is a 35 page set of instructions and regulations and could not be regarded as a syllabus of instruction. This "course" was signed off as having been completed on the second day of employment. The content could not be absorbed in that short length of time. The Safe Manual Handling Course was also signed off on the same date. No certificate was available indicating that the Headsetman had received or signed off the 3 day standard training programme.

A Health and Safety Memo reference "Push-back/Headset/Wingman Safety Procedures" was issued to all ramp staff on 28/1/99, six days after the accident.

3. Conclusions

- 3.1** The Tug Driver and Headsetman failed to keep in eye contact with one another.
- 3.2.** The Headsetman moved out of a "safe" area where the tug cannot manoeuvre into (without snapping the pins on the nose-wheel under-carriage).
- 3.3** Due to the construction of new stands behind Stand 9 it was necessary for the pushback crew to be extra vigilant particularly at the acute bend in the taxiway at this point.
- 3.4** The yellow taxi-line out from the stand meets the red taxiway line at an abrupt right angle. It is therefore difficult for the pushback crew to judge when they should start to turn the aircraft.
- 3.5** The Headsetman was not properly trained for the duty to which he was allocated on the day of the incident.
- 3.6** The weather or light conditions were not factors in this incident.

4. Safety Recommendations

- 4.1** It is recommended that all GHA's of the Operator undergo a formal practical and theoretical ground handling training course prior to being employed in that capacity. This course should be developed by the training officer and certification issued on termination of the course. Five days should be adequate for such a course. **(SR 61 of 1999)**
- 4.2** A probationary period under supervision of the Operator's personnel should then take place before the operative is given a certificate of competence. **(SR 62 of 1999)**
- 4.3** A proper syllabus of training should be set out by the Operator detailing the hours of classroom and practical instruction. **(SR 63 of 1999)**
- 4.4** Consideration should be given by the Operator to installing a safety guard over the front wheels of aircraft tugs. **(SR 64 of 1999)**

Note Subsequent to this incident the Operator developed a 5 day training course, with syllabus, which has now become standard for all GHA trainees.