

**AAIB Bulletin No: 1/96**

**Ref: EW/C95/11/1**

**Category: 1.1**

**Aircraft Type and Registration:** BAe ATP, G-BTTO

**No & Type of Engines:** 2 Pratt & Whitney Canada PW-126 turboprop engines

**Year of Manufacture:** 1990

**Date & Time (UTC):** 12 November 1995 at 1856 hrs

**Location:** Belfast City Airport

**Type of Flight:** Public Transport

**Persons on Board:** Crew - 4                      Passengers - 54

**Injuries:** Crew - None                      Passengers - None

**Nature of Damage:** Propeller, aircraft fuselage

**Commander's Licence:** Airline Transport Pilot's Licence

**Commander's Age:** 54 years

**Commander's Flying Experience:** 7,652 hours (of which 920 were on type)  
Last 90 days - 144 hours  
Last 28 days - 56 hours

**Information Source:** AAIB Field Investigation

The flight arrived at Belfast City Airport at 1740 hrs but was held for 8 minutes on the area known as "Queens" due to ramp congestion, before being able to park on the main apron at 1748 hrs. The scheduled departure from Belfast was 1900 hrs. By this time night had fallen and it was raining heavily. The engines were started normally and, once the generators were on line, the commander gave the ground crew, who was not on headset, the signal to remove the GPU (ground power unit). At this point the flight crew concentrated on completing the after-start checks and the ground crew, having disconnected the ground power cable, proceeded to stow the cable in the tray built into the lower part of the unit for that purpose. He then removed the nosewheel chocks and having put those into the same stowage, got into the cab of the tractor used to tow the GPU and drove away in a left-hand arc which took him clear of the aircraft to a position from which he could see the commander.

Due to the rain, the tractor was completely closed up and so, having stopped in this position, the ground crewman had to open the side door of the cab to signal to the commander that the ground equipment was clear. The door of the tractor is hinged at the rear, so in order to be able to signal to the aircraft without leaving the cab the driver would have to position the tractor with the aircraft forward

and to the side of him, he would not have had the vehicle that he was towing in his line of sight at this time. Having done this, he proceeded to drive the few yards to the front of the terminal building where he intended to park. On arrival at the parking area he noticed that the GPU was not connected to the tractor. He therefore turned the tractor around intending to return to the aircraft.

Having obtained taxi clearance from ATC and having satisfied themselves that the area was clear, the flight crew started to taxi the aircraft. When both pilots were confirming that the area ahead of the aircraft was clear to taxi, the commander remarked that he was having difficulty seeing the ground crew because the lights of the terminal building were shining in his eyes but the first officer had less difficulty as he had the assistance of the aircraft lights. Within seconds of beginning to move, there was a loud noise from the right-hand side of the aircraft followed by the alert audible warning in the cockpit. The pilots shut down both engines and, having ascertained that there was no fire, advised the cabin crew to disembark the passengers using the forward airstairs. By this time the crew had realised that they had collided with the GPU.

During the period that the aircraft had been parked on the apron in front of the terminal building, an unidentified member of the ground handling staff at the airport needed a tractor to move some ground equipment. As there was a lot of activity at that time he used the tractor which was parked in front of G-BTTO and which had been used to position the GPU at the aircraft. On completion of this task, he then returned the tractor to its position beside the aircraft but did not reconnect it to the GPU. The ground crew responsible for removing the GPU after engine start failed to notice that it was not connected to the tractor because the two pieces of equipment were apparently in correct proximity.

### **Contributory Factors**

The following factors were identified as having contributed to this accident:

1. The ground crew who used the tractor whilst the aircraft was parked failed to connect it to the GPU when he returned it although he positioned it in such a way that it could be connected.
2. The ground crew who was tasked to handle the departure of the aircraft was single-handed contrary to the airport standing instructions, and was allocated to the task immediately before the aircraft was due to start engines.
3. The GPU was parked immediately to the right of the aircraft nose and was not visible to the flight crew. The manufacturer's ground handling notes for the aircraft type indicate a position which is within view of the flight deck.

4. It is uncertain whether the amber obstacle light on the GPU was switched on during the transit. Inspection of other units revealed that most did not have a serviceable amber obstacle light and no GPU was observed operating with the amber obstacle light switched on.
5. The GPUs at the airport, with the exception of one new unit owned by the aircraft operator and which was not used for this departure, are uniformly painted light blue with a logo comprising a dark blue and a yellow triangle on each side. This colour scheme renders the unit difficult to see when it is not illuminated.
6. The apron area at Belfast City Airport is illuminated by a line of sodium lights which are positioned on the roof of the terminal building which is just two stories high. As a result the illumination of the apron is uni-directional and the right-hand side of the aircraft was in shadow. Other lights which are on towers in the vicinity of the apron are too far away from the apron to provide any illumination on the dark side of the aircraft.
7. The towing pins used to connect the tractors to the towed vehicles are not of a uniform design; they consist of a pin with a variety of different size rods welded at the top to form a 'tee'. When the pin is in position, it is difficult to see it, especially in the dark.
8. Mounted on the top of the tractor cab is an inspection light which is intended to illuminate the equipment being towed. During an inspection of all the tractors parked on the apron none had a functioning inspection light and in one case the switch had actually been broken off.
9. The driver's seat on the tractor is surrounded by a small cab which incorporates perspex windows to the rear and the sides. When these are wet and/or dirty it is difficult to see out of the cab in any direction other than forward.
10. The tractor's cab has a window at the rear which is hinged at the top and which may be kept open by a gas strut. However, at the time of the accident, this window had been closed because of the rain and, with it in this position, it is not possible for the driver to put his head sufficiently far back to be able to see the towing pin.

### **Additional Factors**

The Ramp Services Handbook for the airport contains procedures for aircraft starting engines on the ramp, these clearly indicate that two ground crew should be used; one to remove the GPU and the other to supervise his activity and communicate with the flight crew. This was not the case on this occasion.

Electronic headsets for ground crew to communicate with the flight deck were delivered to the airport at the beginning of August 1995 with the intention that they would be in general use by the end of that month, however they were not used on this occasion.

A number of Mandatory Occurrence Reports (MOR) have been filed in 1995 relating to aircraft marshalling and apron practice at this airport but there has been some delay in their communication to the airport management.

### **Safety Recommendations**

The following safety recommendations are made:

**95-55:** Belfast City Airport Limited should re-assess as a matter of urgency its Airside Safety Management System with particular reference to apron procedures for the arrival, turnaround and despatch of aircraft; the apron environment, including markings and lighting; the serviceability and suitability of ground equipment; and the supervision, training and conduct of airport ramp personnel.

**95-56:** The CAA should ensure, as part of an In Depth Audit of Belfast City Airport, that the safety deficiencies identified by this investigation have been addressed.