

ACCIDENT

Aircraft Type and Registration:	Boeing 767-304, G-OBYJ	
No & Type of Engines:	2 General Electric CF6-80C2B7F turbofan engines	
Year of Manufacture:	2000	
Date & Time (UTC):	16 February 2005 at 0805 hrs	
Location:	Luton Airport	
Type of Flight:	Public Transport (Non revenue)	
Persons on Board:	Crew - 2	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Puncture to underside of fuselage aft of nose landing gear, two fuselage frames bent, left nose landing gear tyre damaged	
Commander's Licence:	Airline Transport Pilot's Licence	
Commander's Age:	54 years	
Commander's Flying Experience:	15,500 hours (of which 2,000 were on type) Last 90 days - 100 hours Last 28 days - 45 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and AAIB enquiries	

Synopsis

The aircraft had been pushed back, with engines running, and the ground handling crew was then asked to tow it forward. During the manoeuvre the towbar shear pins failed, the tug was braked to a stop and the aircraft ran into the tug. Ownership of the towbar was not clear and consequently it had not been maintained and was unserviceable. The ground crew's training had not prepared them for towing an aircraft forwards.

One Safety Recommendation has been made.

History of the event

The aircraft was pushed back from a parking stand onto the taxiway centreline in preparation for a positioning flight. The ground handling crew consisted of a tug driver and a headset operator who was to relay information between the flight crew and the tug driver. The ground handling crew, together with the tug and towbar, had been supplied by the contracted agent. The aircraft's engines were started during the push-back manoeuvre and were running at idle power when the flight crew relayed an instruction from ATC requiring the ground crew to tow the aircraft forward. However, during this process the tow bar shear pins failed, and the tug driver applied the tug brakes. The aircraft continued to move

forwards under its own inertia and the thrust of its idling engines causing the tow bar to jack-knife and the aircraft to strike the roof of the stationary tug; the aircraft's forward fuselage suffered damage to its skin and frames. The flight crew had been unable to see events developing on the ground, as the aircraft's structure had obscured their view.

Examination of the towbar

Examination of the two towbar shear pins revealed that both pins had suffered shear overload failures at two locations on their shanks, as intended by design. Of the four pairs of shear faces, however, one pair was heavily corroded which indicated that this shear had been complete for a considerable period of time; the other shear failures were relatively bright. The presence of an old, complete, shear failure indicated that the bolt shank had been subjected to an overload at some time in the past. It also indicated that the towbar had received no substantial maintenance since that time.

Towbar ownership, condition and maintenance

This was the only Boeing 767 towbar generally available to the handling agents and their need for it was relatively infrequent. The only other B767 towbar on the airport was retained by the aircraft's operator, who had a maintenance base there, and was provided for the use of their engineering staff. Enquiries revealed that the towbar involved in the incident had been present at the airport for some time. The operator believed that originally it had been owned by them but that they had transferred its ownership to the ground handling company some years before. The handling company believed that the towbar was still owned by the operator but that they had permission to use it when required. No records could be found to substantiate either view.

As a result, neither the ground handling company nor the airline believed they owned the towbar and, consequently, neither believed that they were responsible for its condition and neither had performed any maintenance on it for a considerable period. The Service Level Agreement between the aircraft operator and the handling company gave details of the services to be provided and the relevant conditions. The paragraph relating to tow bars stated

'(The handling company) will provide towbars for the pushback of (the operator's) aircraft. Any towbars in the possession of the handling agent will remain, together with responsibility for repair and replacement, however ownership remains with the (the operator) (sic).

The handling company's maintenance schedule for the tow bars for which it was responsible required them to be partially disassembled and inspected every ten weeks. All items of ground equipment in their control were marked with 'Asset Numbers' to enable the handling company to keep track of their maintenance; the towbar involved in this accident had no such number. The handling company operating procedures required ground crews to satisfy themselves that the equipment to be used for any task was suitable for the purpose and in a satisfactory condition. Their training was designed to ensure that they were capable of this.

Ground handling operations and training

The handling company had a modular training scheme for its staff. This consisted of theoretical and practical instruction with subsequent tests; trainees were provided with hand-outs which highlighted key elements of the training. Enquiries after the accident revealed that both members of this ground crew had recently received the training and had qualified to perform their respective

tasks during 'push-back' manoeuvres. Neither had received any training in towing or 'pull-forward' manoeuvres. In his push-back training the tug driver had been instructed to apply the tug brakes in the event of shear pin failure. This would be appropriate during a push-back operation but inappropriate during towing or pulling operations as it could result in the aircraft colliding with the tug. The handling company training module for 'Towing' was designed to qualify tug drivers to tow empty aircraft, with their engines not running, on the manoeuvring area. The ground handling company had no training module relevant to towing or pulling aircraft with their engines running.

ATC at most major airports require 'push and pull' procedures, with engines running, to expedite traffic flow and ease ramp congestion. Investigations revealed that these procedures were regularly used at the airport, and the handling company's tug drivers did carry out 'pull' manoeuvres relatively frequently, although only two had undergone the 'Towing' training. Following this incident, both the handling agent and the aircraft operator have made changes to their procedures for aircraft push-back and pull-forward manoeuvres.

Oversight of airport airside ground services

Aircraft operators and airports are licensed, inspected, and audited by the CAA; there are no requirements or enforceable standards for the regulation and oversight of ground handling agents, other companies providing the ground services at airports or of the equipment they use. However JAR-OPS Subpart C, Appendix 2 to JAR-OPS 1.175 (c) requires an Air Operator Certificate (AOC) holder to establish standards for training and supervision of ground staff.

The CAA publication CAP 642 provides guidance for aircraft, airport operators and third party airside

organisations, on safe operating practices for airside activities. Amongst the stated reasons for this document coming into existence was that:

'The airline and airport industry and their safety regulators were concerned about the level and extent of damage caused to aircraft during ground handling'.

CAP 642 intentionally does not define the scope or standards for training to be met by the ground staff operating airside, nor does it contain any detail relating to the suitability or condition of the items of ground equipment they use.

Discussion

Whilst they have no regulatory power to do so, airport operators do oversee the quality of provision of handling services to some extent. The airport operator had, some time before this incident, become concerned about the standards of the handling company involved and had taken steps to address the problem by first requiring an improvement in performance, and, when this was not forthcoming, by giving notice to the handling company to cease operations. However, the handling company's subsequent assurances to the airport operator had resulted in the withdrawal of this notice.

This accident was the result of ground handling staff being asked to perform, at short notice, a relatively commonplace task. It was, however, unexpected and was a task for which they had not been trained. They were also using a towbar which was not maintained and which was unserviceable as a result of misunderstandings concerning its ownership. Since the push-back manoeuvre was a common one, it is considered that the training to perform it should have fallen into a defined minimum training package for ground staff qualified to

handle aircraft in tug and towbar operations. There is no authority which ensures the adequacy of any training curriculum for ground handling staff, merely a general responsibility as defined in JAR-OPS.

The AAIB has been notified of a number of incidents involving mobile ground equipment. There are no required standards for the training and competence of ground handling staff, nor are there any for the suitability or condition of the items of ground equipment which they use.

Such standards as there are, appear to derive from commercial considerations rather than a requirement to minimise the possibility of damaging the aircraft, which are the focus of their operations. As a result of the absence of defined standards, it is not currently possible to regulate airside ground handling in the terminal areas. The pace of ground handling at airports which are small, and those involved mainly with general aviation, may still tolerate an unregulated regime. It is, however, considered that regulation of this increasingly busy environment at the larger airports, with high levels of ground activity around their terminals, has become necessary to avoid increasing amounts of damage being inflicted on aircraft at airport terminals.

The following Safety Recommendations are, therefore, made.

Safety Recommendation 2006-118

It is recommended that the Civil Aviation Authority reminds AOC holders of their responsibility to ensure that suitable curricula and standards are in place for the training and maintenance of competency of staff involved in the ground handling of commercial aircraft at airports and also that they should require a means of ensuring adherence to those standards.

As a result of AAIB investigations into two other ground incidents (Boeing 737 registration EI-DAP reported in AAIB Bulletin 9/2006 and DHC-8 registration G-BRYW reported in AAIB Bulletin 11/2006 (this Bulletin), Safety Recommendation 2006/060 was made, and this is repeated here:

AAIB Safety Recommendation 2006-060

It is recommended that the Civil Aviation Authority should remind airport operators that their Safety Management Systems should ensure that safe standards of maintenance and use are applied to all vehicles and mobile ground equipment used in the proximity of aircraft.