

Airbus A320-200, G-MONY, 13 April 1996

AAIB Bulletin No: 8/96 Ref: EW/C96/4/14 Category: 1.1

INCIDENT

Aircraft Type and Registration: Airbus A320-200, G-MONY

No & Type of Engines: 2 CFM-56 turbofan engines

Year of Manufacture: 1992

Date & Time (UTC): 13 April 1996 at 1730 hrs

Location: Stand 42, Birmingham Airport

Type of Flight: Public Transport

Persons on Board: Crew - 7 Passengers - 180

Injuries: Crew - None Passengers - None

Nature of Damage: Slight skin damage to forward passenger door

Commander's Licence: Airline Transport Pilot's Licence

Commander's Age: 43 years

Commander's Flying Experience: 11,652 hours (of which 1,215 were on type)

Last 90 days - 153 hours

Last 28 days - 48 hours

Information Source: AAIB Field Investigation

The aircraft was parked on stand 42 at Birmingham International Airport with the airbridge aligned against the aircraft for passenger disembarkation through the forward passenger door.

During disembarkation the commander heard a 'thump' which was followed by an ECAM (Electronic Central Aircraft Monitoring) system warning of a flight control computer fault followed by an indication that the 'blue' system hydraulic pump was running. Approximately one minute later the ECAM gave a further warning of a 'Flight Warning Computer' (FWC) 1 and 2 fault. At this point the oncoming commander for the next sector, who had been observing the passengers leave the aircraft from the ramp, pushed past them to inform the flight crew that the nose oleo was at full extension (this had activated the air/ground logic switch which operates with less than 500 kg of weight applied to the nose oleo). The commander immediately stopped the disembarkation with 70

of the passengers still remaining on board. They later left the aircraft via mobile steps positioned at the rear door. During the passenger disembarkation the baggage handlers, contrary to company instructions, had been unloading baggage from the forward hold first instead of from the rear hold.

Stand 42 is equipped with a controllable 'Rail Drive Bridge' (Safegate). Suitably qualified personnel from the Handling Agency can control the movement of this 'bridge' horizontally; by extension or retraction of the sliding tunnel; vertically by raising and lowering of the bridge floor level and radially by rotating the cab end of the tunnel. An auto levelling device positioned and held against the side of the aircraft, adjacent to the passenger door, automatically adjusts the height of the bridge floor to cater for vertical movements of the aircraft during loading and unloading. A further safety 'shoe', positioned on the airbridge floor under the open aircraft door senses any door contact and signals the bridge to move down automatically. This safety shoe is automatically activated when in the auto level mode.

The Airport Authority provide training for all airbridge operators and issue them with an appropriate licence. They also publish an Airport Operational Instruction (AOI 01/95) entitled 'AIRCRAFT STANDS - AIR BRIDGES AND PARKING GUIDANCE'. Paragraph 7.1 under the heading 'USE OF AIR BRIDGES' states:

'No airbridge must be left unattended whilst in the "Auto-Level condition" when docked to

an aircraft. A qualified operator must remain in attendance to respond to any audible alarm which may occur. During the period between completing disembarkation and boarding passengers for the next flights, if the airbridge is to be left unattended, the aircraft door should be closed, the jetty withdrawn clear of the aircraft side and shut down.'

On the day of the incident the handling agent had activated the auto levelling device attached to the jetty but the safety 'shoe' was not installed and available for use. Furthermore the operator appears not to have been present in the bridge 'cab' at the time of the incident.

Summary of unloading sequence

During passenger disembarkation the baggage handlers were incorrectly unloading the baggage from the forward hold first. This, exacerbated by the disembarkation of passengers from the front of the cabin, caused the aircraft to become tail heavy. The height of the forward door increased progressively but this was compensated for by the auto levelling of the jetty floor which operated correctly. As baggage unloading progressed, now from the rear hold, and as passengers from the rear of the aircraft started to move forward to disembark, the height of the forward door began to decrease. Unfortunately at this stage the auto levelling device failed and automatically removed all power from the jetty controls. The aircraft continued to settle with the door contacting the floor of the jetty allowing a significant proportion of the aircraft weight to be supported by the door itself. In this case, although the mismanaged unloading of the baggage increased the upward movement of the forward door, it also helped to minimise the damage to the aircraft structure. The aircraft was delayed approximately 4 hours after the incident whilst company engineers inspected the door in accordance with maintenance manual procedures.

The aircraft sustained minor damage to the door skin in the form of a 12 inch long crease 2 inches above the lower edge at the lower aft corner. Visual inspection revealed that there was no cracking and no damage to the door and fuselage mountings and surrounding structure. Door and slide operation, indication and ground pressurisation checks were also satisfactory. The company also

contacted the manufacturers asking them to provide details of any Non Destructive Testing (NDT) inspections that may have been required.

Other Incidents

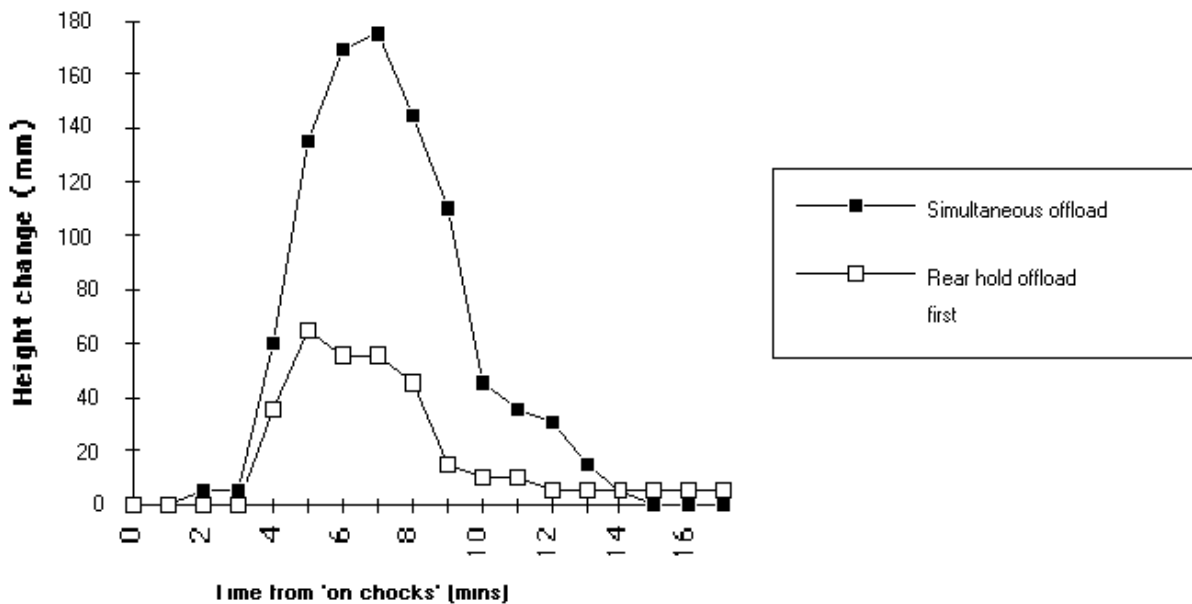
A similar incident occurred on 18 April 1996 to the same aircraft on stand 53 at Birmingham. The 'Safegate' airbridge had been positioned normally with the normal gap below the forward passenger door. As passengers disembarked the bottom of the door contacted the floor of the airbridge. The pilot reported that the autolevelling device appeared not to be working.

Follow-up action

As a result of these incidents the AAIB, together with the Airport Authority, examined the operation of the 'Safegate' airbridges on stands 42 and 53 and carried out trials to measure the amount of vertical movement of the forward door sill height of an A320-200 aircraft during normal passenger disembarkation.

Two trials were conducted to measure the changes in height of the aircraft fuselage adjacent to the nose landing gear (directly in-line with the forward passenger door). Measurements were taken at one minute intervals. In trial No 1 the front and rear holds of the aircraft were unloaded simultaneously whilst the passengers were disembarking through the forward door only. The conditions for trial No 2 were the same except that the rear hold was unloaded first (the procedure specified by the company). The results from these trials were compared with tabulated information supplied by Airbus in their operations manual (Chapter 2.3 page 1) under the title 'AIRPLANE CHARACTERISTICS'. The table gives details of heights above ground for various points along the aircraft's length under empty operating weight conditions with a C of G at 22%; at maximum ramp weight with a C of G at 18.6% and at maximum ramp weight with a C of G at 41%. The results of the trials and the relevant manufacturers figures are included below:

A320-200 MOVEMENT OF NOSE GEAR DATUM



Simultaneous offload: Aircraft landing weight = 60,473 kg; ZFW CG=35.5%; (pax=174, bags=205)

Rear hold offload: Aircraft landing weight = 60,043kg; ZFW CG=32.2%; (pax=169, bags=187)

AIRPLANE CHARACTERISTICS - A320 Model 100 & 200

	OPERATING WEIGHT EMPTY CG 22%		MAXIMUM RAMP WEIGHT CG 18.6%		MAXIMUM RAMP WEIGHT CG 41%	
	Metres	Feet	Metres	Feet	Metres	Feet
Front door sill height	3.45	11.31	3.39	11.12	3.46	11.36

The manufacturers data above gives details of the forward doorsill height at the three conditions stated. It does not however give an indication as to the total range of movement of the door height during weight changes. The manufacturers data implies that, at worst, the maximum amount of height change is 7 cm. On the other hand measurements taken from the trials shows that the maximum amount of total movement that can be expected, during a routine disembarkation, is at least 17.5 cm.

Safety Recommendation 96-63

It is therefore recommended that Airbus provide A320 operators with information on the maximum amount of door (both front and rear) sill height movement that can be expected, during aircraft weight changes, in order that airbridges, without auto levelling devices, and fixed height mobile steps can be positioned accordingly so as to avoid aircraft structural damage.

