BAe 146-200, G-JEAS, 19 May 1996

AAIB Bulletin No: 8/96 Ref: EW/C96/5/8 Category: 1.1

Aircraft Type and Registration: BAe 146-200, G-JEAS

No & Type of Engines: 4 Lycoming ALF502 - R5 turbofanengines

Year of Manufacture: 1984

Date & Time (UTC): 19 May 1996 at about 1205 hrs

Location: Exeter Airport, Devon

Type of Flight: Public Transport

Persons on Board: Crew - 5 Passengers - None

Injuries: Crew - None Passengers - N/A

Other - 1 serious

Nature of Damage: Slight damage to fuselage paint

Commander's Licence: Not relevant

Commander's Age: Not relevant

Commander's Flying Experience: Not relevant

Information Source: AAIB Field Investigation

History of the accident

The aircraft was parked parallel to the terminal building, about65 metres behind a Fokker F-27. Both aircraft were facing southwest; the BAe 146 was about one metre to the right of the yellowtaxiway line and the F-27 about one metre to the left. The 1150hrs weather observation for Exeter gave the surface wind as 250°/19kt with gusts to 28 kt; the direction varied between 220°and 280°. A gust of 26 kt was recorded at 1203 hrs. Theconcrete ramp surface was wet from recent rain.

The passengers had disembarked from the BAe146 and only the operatingcrew and ground handling personnel were on board. One of thelatter, a member of the airport catering staff, had just deliveredsome supplies. She left the aircraft through the front passengerdoor, and had both feet on the top section of the aircraft steps,when the F-27 started to taxi forward; at this point the bottomof the steps started to move rearwards in an arc centred on therear top corner which was against the fuselage. The lady fellbackwards, from a height of about 2 metres, onto the ground belowand

sustained serious injury to her back, ribs and head. Thesteps continued rearwards scraping along the fuselage and cameto rest against the left main landing gear. First aid was renderedby airport staff until the lady could be transferred to the Exeterand Devon General Hospital; her condition remained critical andshe was later transferred to a specialist unit in a hospital inPlymouth.

Aircraft steps

The rigid frame steps were carried on four, 5 inch diameter nylonwheels; the wheels at the aircraft end were fixed and unbrakedwhile those at the other end were able to castor through 360°and were braked by the action of a metal pad applying pressureto the perimeter of the wheel. When the steps were first positioned,the No 1 cabin attendant was not satisfied and asked for themto be repositioned, however, this was because the moveable flapwhich compensates for the variation of door sill height duringloading/unloading was considered to be a trip hazard to disembarkingpassengers. The steps were repositioned with the protective padnot so firmly butted against the side of the fuselage, and a memberof the customer services staff stood at the front of the top platformto guard a gap between the opened aircraft door and the hand rail.

When the steps are correctly positioned the brakes are appliedand the normal practice is for the ground handler to pull backon the hand rails to check that the brake is effective. The groundhandler who positioned the steps prior to the accident statedthat he had carried out this check both initially and followingthe repositioning. An eye witness in the terminal building hadwatched the arrival of the BAe146 and, having heard about theaccident, contacted the Airport Operations Director to say shehad watched the ground handler position the steps and had beenimpressed by his thoroughness; she particularly noted that hehad done something to the small wheels at the bottom of the steps. All the arriving passengers, many elderly and some needing wheelchairs,had disembarked from the forward passenger door via these stepswithout incident.

The commander of the F27 said that he had applied about 11,500RPM to start his aircraft moving from the stand; this is a normalsetting for the prevailing conditions. Fokker Services estimatedthat the speed of the propeller wash at 60 to 70 metres, in stillair, would have been of the order of 18 to 23 kt.

The steps had been obtained from another airport in about 1989and had been used infrequently, mainly on BAe146 type aircraft,since that time. Maintenance of the steps was done locally; thereare few moving parts and maintenance was on an 'on condition'basis. No maintenance records were available.

Initial post accident examination of the steps, in a hangar, revealedthat the brake on the right wheel (looking up the steps) was ineffective;the brake on the left wheel was more effective, however, distortionof the frame of the steps meant that, on a flat surface, thiswheel did not touch the ground. In this condition the steps couldbe manoeuvred easily with both brakes applied. The steps weresubsequently positioned in approximately the same area as theyhad been at the time of the accident; the surface was relativelyflat and the effect of the distortion was evident. The constructionof the frame and brakes was such that it was felt unlikely thatthe condition of the steps was a consequence of the event butrather that it had existed for some time.

Aircraft parking

While it was usual practice to park propeller driven aircraftalong the front of the terminal building, often in line facinginto the prevailing south westerly wind, jet aircraft were normallyparked on

another part of the ramp. On this occasion the BAe146 was parked in front of the terminal because of lack of spacein the normal jet parking area. The minimum spacing of one aircraftbehind another is determined by the clearance needed for the rearone to leave the ramp first.

A ground handling crew would not normally indicate that an aircraftwas clear to start if passengers were embarking or disembarkingfrom one parked directly behind it. However, if only ground oraircrew personnel are attending that aircraft it does not appearto generate the same caution. Compared with nose-in parking,nose to tail parking can make personnel and equipment more vulnerableto the effects of jet blast or propeller wash as well as increasingthe possibility of foreign object damage to other aircraft inthe line.

Ramp safety training

The onus for training catering personnel who were required tocarry out tasks airside, fell to the catering company. In thiscase the injured lady started with the company at the end of Februaryand her training was done by the catering manager who also accompaniedher onto the ramp for the first four days. There was no evidenceto suggest that this training was done in other than a thoroughand professional manner and it was not a factor in the accident.

Health and Safety Executive (HSE)

Regulatory responsibility for airfields is shared by both HSEand CAA; although some aspects can be specific to either organisation,many responsibilities are common and there is an overlap of interests. Attention is drawn to CAP 642 - Apron Safety Management. HSEcarried out a parallel investigation into this accident and aSpecialist Inspector (Mechanical Engineering) undertook an assessmentof the serviceability and suitability of the steps.