Boeing 767-31K, G-DAJC

AAIB Bulletin No: 10/98 Ref: EW/G98/04/19 Category: 1.1

Aircraft Type and Registration:	Boeing 767-31K, G-DAJC
No & Type of Engines:	2 General Electric CF6-80C2B7F turbofan engines
Year of Manufacture:	1994
Date & Time (UTC):	29 April 1998 at 0630 hrs
Location:	Birmingham International Airport
Type of Flight:	Public Transport (Passenger)
Persons on Board:	Crew - 11 - Passengers - 2 (positioning crew)
Injuries:	Crew - None - Passengers - None
Nature of Damage:	Minor to the left engine cowling and left leading edge slats
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	58 years
Commander's Flying Experience:	14,500 hours (of which 1,152 were on type) Last 90 days - 172 hours Last 28 days - 59 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB

History of the flight

The aircraft departed from Manchester at 0625 hrs for a positioning flight to Birmingham. The flight was uneventful with the aircraft landing at Birmingham at 0700 hrs. Due to the short flight time the crew were not able to contact the handling agent at Birmingham with their estimated time of arrival.

After landing on Runway 15, the aircraft was cleared by ATC to proceed along taxiway 'E' onto Stand 56. As the aircraft approached the stand, the 'Safegate' Docking System lit up with the lower green lights flashing and a message of 'STOP SHORT' flashing at the top of the display. The Captain taxied the aircraft slowly along the centreline of the stand noting that there were two ground crew standing by a towbar and an engineer present to meet the aircraft. As the aircraft

approached the terminal building a bump was felt and the aircraft was brought to a halt. The Captain then noticed the engineer waving to him and shut down the engines.

Apron Control was advised by a Movement Area Safety Unit (MASU) officer that the aircraft had sustained damage to the leading edge of the port wing and that the port engine nacelle had become wedged under the 'airbridge'. He requested the attendance of the Airport Fire Service and Facilities Services (Airport Engineering) on the stand. The DGS 'STOP SHORT' sign could be seen still flashing after the collision. Moments later one of the flight crew (unidentified) appeared at Door 2L and asked what was to be done. The MASU officer advised that the Airport Fire Service and Operations Duty Manager (ODM) were on their way. He also asked the crew member why the aircraft had not stopped short to which the reply was "stop short of what?"

Birmingham Stand 56

Stand 56 is equipped with a 'Safegate' Docking Guidance System (DGS) and a 'Safegate' Fixed Nose Loader 'Airbridge'. Use of the stand by Boeing 767-300 aircraft is subject to a Movement Area Safety Unit (MASU) Instruction which was promulgated on 24 August 1997. On 19 February 1998 the Airfield Management sent a copy of the Instruction to the local Handling Agents and informed them that they now had the responsibility for marshalling the aircraft and setting the DGS. The stand allocation for that day was issued by Apron Control to the Handling Agents before 2200 hrs the previous day. This was confirmed by the Movement Record Sheet from their Load Control.

At 0755 hrs on the day of the occurrence the Apron Controller contacted the Handling Agents Load Control Section to remind them that a marshaller would be required to guide the aircraft onto Stand 56 and that the aircraft would be required to 'STOP SHORT' and to be towed forward so that the 'airbridge' could be manoeuvred onto the aircraft. There was no marshaller present when the aircraft arrived on the stand. The Airbridge Operator had previously selected 'STOP SHORT' on the 'Safegate' DGS aircraft selector panel at the 'airbridge' operator's position and 'STOP SHORT' was displayed on the DGS upper display when the aircraft arrived. As the aircraft was manoeuvred along the stand centreline the ground engineer saw that the aircraft was moving too far up the stand and waved his arms at the flight deck in an attempt to signal that the aircraft should stop. The aircraft subsequently overran the paint mark adjacent to the stand centreline (indicating the nosewheel position for Boeing 767-300 for Door 2L) by 3.3 metres. Neither the 'airbridge' operator nor the ground engineer attempted to make use of the DGS 'Emergency Stop' buttons. Had these buttons been used the display below the 'STOP SHORT' instruction would also have indicated 'STOP'.

Stand 56 had been used 32 times, without incident, to accommodate Boeing 767-300 aircraft during the previous two years. Sixteen of these had taken place since the MASU Instruction was

promulgated. After the incident engineering staff inspected the 'airbridge' and declared it fit for use. They also recommend that the DGS should be taken out of service as three induction loops were inoperative. The unserviceability of these induction loops did not however impair the DGS in so far as the 'STOP SHORT' indication was concerned. The two 'Emergency Stop' buttons were examined and found to be serviceable.

'Safegate' docking procedures

Information describing the operation of and procedures to be followed when using the Safegate Docking System at Birmingham Airport were available to the Flight Crew in the cockpit in Jeppesen publications (reference numbers 10-9B and 10-9C). The ground staff at the airport also had their operating instructions in the form of an Airport Operational Instruction (AOI). The AOI's had a wide circulation list including the Handling Agents and airfield based airlines. The procedure for the use of various DGS types was also included in the Aeronautical Information Publication (AlP) (AGA 8-17) dated April 1992, prior to the new issue of the AIP effective 1 January 1998. Furthermore, a new Civil Aviation Publication (CAP) document; CAP 637 - 'Visual Aids Handbook' was published in 1997. Section 4 of the CAP covers the various types of DGS in operation in the UK.

Both the Jeppeson documentation and the AOI outlined the procedures to be adopted when using the Safegate Docking System and what displays were to be expected. Both outlined the requirement to ensure that the aircraft type was displayed and the airport AOI further expanded on this stating:

> *'Before entering the gate the following must be checked: The correct type of aircraft is displayed in flashing white; The bottom pair of green lights are flashing - ready for docking'.*

The Jeppesen documentation, as well as referring to the green lights, also included a description of all potential messages received from the system except the message displayed to the crew at the time of the incident ie 'STOP SHORT'**.**

CAP 637 and the AOI included the wording:

> *'The STOP SHORT signal will appear on the top panel if either of the following events occur:*

(i) an object (eg a tow bar) is left on the sensors,

(ii) the airplane stops short of the current stopping point.

Follow up action

As a result of the accident the CAA proposed to correct the current information included in the 'Safegate' operation description by amending CAP 637 as follows:

(d) The 'STOP SHORT" function is a manual operation intended for use when, for whatever reason, the ground staff wish the aircraft to be stopped short of the normal stop position. When this function is in use, there will be no distance information, the words 'STOP' and 'SHORT" will appear alternately on the top dot matrix display throughout the entire docking operation and the "ready for docking" (see para 4.2.2 (b)) lights will be flashing. When the aircraft reaches the desired position the ground crew will activate the 'STOP' signal and the adjacent red lamps will flash.

(e) A 'STOP' signal as described in sub para (d) above will also be displayed whenever any of the following events occur:

(i) The ground crew activate the emergency stop function.

(ii) The system's self test function detects an error in the system during the docking procedure.

(iii) The ground crew make an incorrect selection on the operator's panel.