Safety Regulation Group
Safety Investigation and Data Department

Follow-up Action on Occurrence Report

ACCIDENT TO B747-2B5F, HL-7451, NEAR LONDON STANSTED AIRPORT ON 22 DECEMBER 1999
(AIRCRAFT CRASHED SOON AFTER TAKEOFF)

CAA FACTOR NUMBER	:	F18/2003
FACTOR PUBLICATION DATE	:	25 July 2003
OPERATOR	:	Korean Air
CAA OCCURRENCE NUMBER	:	1999/08713
AAIB REPORT	:	AAR 3/2003

SYNOPSIS

(From AAIB Report)

The aircraft arrived at Stansted Airport after a flight from Tashkent, Uzbekistan. Prior to leaving the aircraft, the flight engineer made an entry in the Technical Log to the effect that the captain's Attitude Director Indicator (ADI) was 'unreliable in roll'; he also verbally passed the details to the operator's ground engineer who met the aircraft on arrival. This fault had been detected after takeoff from Tashkent. The inbound flight crew then left the aircraft without meeting the outbound crew who were due to operate HL-7451 to Milan (Malpensa) Airport later that day.

During the turnaround, some cargo was offloaded and other cargo, which had been transported by road from London, was loaded. At the same time, the operator's ground engineer and two other engineers from a local maintenance organisation carried out rectification action in an attempt to correct the reported fault with the ADI. The loading was almost complete when the outbound crew arrived; this crew comprised the commander who was to be the handling pilot, the first officer and the flight engineer. Prior to engine start, the commander accompanied the load controller through the aircraft to check the security of the cargo, and then checked the load sheet before signing it and leaving a copy with the load controller. The operator's ground engineer who had met the aircraft on its arrival at Stansted also boarded the aircraft for the flight to Milan.

At 1727hrs, the aircraft was ready to depart. However, there were delays caused by various factors outside of the crew's control and they were not cleared to taxi until 1825hrs. By 1835 hrs, the crew had contacted the 'Tower' and were instructed: "AFTER THE NEXT LANDING AIRCRAFT ON FINAL LINE UP AND WAIT RUNWAY 23". Subsequently, at 1836 hrs HL-7451, using the callsign KAL8509 was cleared to take off with a reported surface wind of 190deg/18kt. The Tower controller considered that the takeoff was normal and the aircraft disappeared from sight as it entered the cloud base at about 400 feet agl. At 1838hrs, as the aircraft indicated altitude passed 1,400 feet, KAL 8509 was transferred to 'London Control' on frequency 118.82MHz. The crew had been cleared for a departure procedure, which required a left turn at 1.5nm from the Stansted DME (co-incident with the 152deg radial from Barkway VOR) onto a radial of 158deg to the Detling VOR. No radio calls were heard from the aircraft subsequent to the frequency transfer instruction from 'Stansted Tower'. The ATC personnel in the 'Tower' then saw an explosion to the south of the airport and immediately implemented their emergency procedures. The Aerodrome Fire Service recorded receipt of the alerting action from ATC at 1840hrs. Essex police recorded the first emergency call from a member of the public at 1843 hrs.

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Investigations revealed that, throughout the accident flight, the captain's ADI indicated the correct pitch attitude but that the roll attitude remained at a wings level indication. Radar and Flight Data Recorder data showed that the aircraft commenced a turn to the left but that this turn was continuous until impact with the ground. At impact, the aircraft was assessed to be pitched approximately 40deg nose down, banked close to 90deg to the left and with a speed in the region of 250 to 300kt.

The investigation identified the following causal factors:

1 The pilots did not respond appropriately to the comparator warnings during the climb after takeoff from Stansted despite prompts from the flight engineer.

2 The commander, as the handling pilot, maintained a left roll control input, rolling the aircraft to approximately 90deg of left bank and there was no control input to correct the pitch attitude throughout the turn.

3 The first officer either did not monitor the aircraft attitude during the climbing turn or, having done so, did not alert the commander to the extreme unsafe attitude that developed.

4 The maintenance activity at Stansted was misdirected, despite the fault having been correctly reported using the Fault Reporting Manual. Consequently the aircraft was presented for service with the same fault experienced on the previous sector; the No 1 INU roll signal driving the captain's ADI was erroneous.

5 The agreement for local engineering support of the Operator's engineering personnel, was unclear on the division of responsibility, resulting in erroneous defect identification, and mis-directed maintenance action.

FOLLOW UP ACTION

The six Safety Recommendations, made by the AAIB following their investigation, are reproduced below, together with the CAA's responses.

Recommendation 2003-62

It is recommended that Korean Air continue to update their training and Flight Quality Assurance programmes, to accommodate Crew Resource Management evolution and industry developments, to address issues specific to their operational environment and ensure adaptation of imported training material to accommodate the Korean culture

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2003-63

It is recommended that Korean Air continue to review its policy and procedures for maintenance support at international destinations with a view to deploying sufficient of its own full-time engineers at the outstation or delegating the entire task to another operator or third-party maintenance organisation locally-based at the destination (Full Technical Handling). If neither of these approaches is practicable then the support arrangements must be detailed and of such clarity as to preclude confusion.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2003-64

It is recommended that Korean Air review its policy and procedures to ensure that a copy of the relevant pages of the Technical Log and any other transit certification documents are left on the ground at the point of departure.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2003-65

It is recommended that ICAO Technical Instructions Part 7, Chapter 4.6.1 be amended to, 'The operator of an aircraft carrying dangerous goods which is involved in an aircraft accident must, as soon as possible, inform the appropriate Authority in the State in which the aircraft accident occurred of the dangerous goods carried together with their proper shipping names, class and subsidiary risks for which labels are required, the compatibility group for Class 1 and the quantity and location on board the aircraft'.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2003-66

It is recommended that ICAO consider an initiative to review the current methods of tracking air cargo and further consider improved systems, utilising electronic data storage and transmission, with a view to providing timely information on the cargo carried by any aircraft involved in an accident.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2003-67

It is recommended that the ICAO Hazard at Accident Sites Study Group is supported and resourced to enable it to meet its target date for delivery of the necessary data and risk management advise.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed