
AIRPOX incident, Boeing 747-436, G-BNLM and Airbus A300-600, A6-EKF, 15 April 1996

Micro-summary: An AIRPROX incident occurred when one aircraft was carrying out a missed approach procedure, and another, which had recently taken off from the same airport, were in conflict.

Event Date: 1996-04-15 at 1841 UTC

Investigative Body: Aircraft Accident Investigation Board (AAIB), United Kingdom

Investigative Body's Web Site: <http://www.aaib.dft.gov/uk/>

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Boeing 747-436, G-BNLM and Airbus A300-600, A6-EKF, 15 April 1996

**AAIB Bulletin No: 7/96 Ref: EW/C96/4/5 Category: 1.1
INCIDENT**

Aircraft Type and Registration:i) Boeing 747-436, G-BNLM

ii) Airbus A300-600, A6-EKF

No & Type of Engines:i) 4 Rolls Royce RB211-524G turbofan engines

ii) 2 CF6 turbofan engines

Year of Manufacture: N/A

Date & Time (UTC): 15 April 1996 at 1841 hrs

Location: London Heathrow Airport

Type of Flights: Public Transport

Persons on Board: i) Crew - 16 Passengers - 289

ii) Crew - 14 Passengers - 224

Injuries: i) Crew - None Passengers - None

ii) Crew - None Passengers - None

Nature of Damage:None

Commanders' Licences: i) Airline Transport Pilot's Licence

ii) Airline Transport Pilot's Licence

Commanders' Ages: N/A

Commanders' Flying Experience: N/A

Information Source: AAIB Field Investigation

History of the Incident

An AIRPROX incident occurred when one aircraft was carrying out a missed approach procedure, and another, which had recently taken off from the same airport, were in conflict.

Before the incident London Heathrow Airport was using Runway 27 Right (27R) for departures and Runway 27 Left (27L) for arrivals. The surface wind was 180°/5 kt, 8 km visibility and QNH 1022 mb. At 1836 hrs, an Airbus A310 landing on Runway 27L was observed to have smoke coming from its main undercarriage, possibly due to a burst tyre on landing. The Arrivals Controller asked its crew to clear the runway to the right, to hold clear and to await a landing gear inspection. While this was being carried out the runway was checked for possible debris. The following aircraft on the approach, an Airbus A300-600, had by this time reached a distance of two miles from touchdown and its crew was instructed to carry out the missed approach procedure, climbing on the runway heading to 1500 feet. The pilot of the next aircraft on the approach was then asked to confirm that he could see the departures Runway (27R). He was then told to change his approach and land on that runway.

Departures Control

The Departures Controller, (responsible for Runway 27R), was very busy with nine aircraft waiting for take-off. At the time the A300 carried out its missed approach, two aircraft were lined up on 27R, one at a runway intersection and one on the threshold. A B747-400, waiting at the holding point, had been cleared to line up and to be ready for take off once the second of these had commenced its take-off run. Immediately after clearing the second aircraft for take off, the Departures Controller amended this instruction to the B747-400 and told it to hold its position since he knew that Runway 27R was likely to be needed for landing aircraft and he did not want to B 747-400 to enter the runway. The controller then asked the B747-400 crew if their aircraft was infringing the runway to which the answer was "negative....". The Departures Controller however, felt uncertain that the runway was not in fact infringed and so he decided to ask the B747 400 to enter the runway in preparation for take off. As it started to do this, the controller cancelled the line-up clearance for the next aircraft due for departure after it. He then cleared the B747-400 for take off, adding 'THERE'S TRAFFIC SWITCHING AT THREE MILES IF YOU CAN TAKE IT ON THE ROLL I'LL BE GRATEFUL'.

The B747-400 took-off at 1838:10 hrs. The Departures Controller then cleared the aircraft which had been transferred to him by the Arrivals Controller having been switched across from Runway 27L to land. After issuing taxi instructions to another aircraft and asking a previous departing aircraft to change to its Departure Control frequency, he instructed the departing B747-400 to maintain the runway heading.

Arrivals Control

At approximately the same time as this last instruction was given, the Arrivals Controller advised the A300 which was carrying out the missed approach that it was now clear to climb to 3000 feet. Approximately two minutes had elapsed since the A300 had commenced its missed approach. During that time the controller had been attempting to contact the Heathrow Director on his direct line to advise that he intended to hand the A300 over to be positioned for a second approach to land but he was unable to make contact, due to an apparent equipment unserviceability, and he had telephoned the Director on a normal telephone line instead. In addition, the Arrivals Controller had initiated the ground emergency call to the airfield fire service concerning the A310 with a burst tyre and had given runway crossing clearances to a helicopter and a ground vehicle. He had also coordinated with the airfield unit responsible for checking the condition of the runway and advised a

further aircraft, which by this time was four miles from touchdown, that it was to continue its approach as he anticipated that the runway would be available in time for it to land.

When contact was established with the Director, the Approach Controller was told that the A300 was to be cleared onto a heading of 130° climbing to 3000 feet and should call the Director on 134.97 MHz. Since he had already cleared the A300 to climb to 3000 feet, the Approach Controller instructed it to turn onto a heading of 130°. He also attempted to tell it to change radio frequency but he could not remember the correct frequency as his work-load was now exacerbated by the aircraft on short finals for his runway(27L) which was no longer able to side-step to runway 27R. After initiating a missed approach for this aircraft and speaking to the runway checking unit once again, he finally advised the A300 crew to change frequency. The frequency he gave was incorrect but the crew changed to the correct frequency nonetheless.

Meanwhile, twenty seconds before this frequency change, the Departures Controller cleared the B747-400 to commence a left turn and proceed to the Epsom NDB, and to change radio frequency to the London Terminal Control. Because of the way in which he had set-up his Aerodrome Traffic Monitor radar set, he was no longer able to see the A300 radar return.

Traffic-alert and Collision Avoidance System

At 1841 hrs, both the B747-400 and the A300 checked-in on their respective frequencies. They were at this stage on converging tracks 1.39 nm apart with the A300 at 3000 feet and the B747-400 seven hundred feet below it with a clearance to climb to be at or above 3000 feet by the Epsom NDB, as required by the Dover 4F Standard Instrument Departure (SID) (see Figure 1). As soon as radio contact was established, the A300 was instructed to climb to 4000 feet and to turn left onto a heading of 090°. The B747-400 was instructed to stop its climb immediately, given traffic information concerning the conflicting aircraft, and issued with an instruction to turn onto a heading of 080°. At that moment the B747-400 crew received a Traffic-alert and Collision Avoidance System (TCAS) warning. This initially advised them of "Traffic", followed by a Resolution Advisory Warning to reduce the climb rate, followed by an instruction to descend. The crew conformed to the instructions given by the TCAS equipment and descended to a height of approximately 1800 feet at which time the TCAS warning ceased. The A300 aircraft also received a TCAS warning which instructed the crew to "Monitor Vertical Speed", this instruction requires that the pilot ensures that the vertical climb rate complies with that indicated by a green sector on the Vertical Speed Indicator (VSI).

Apart from the traffic information passed to the B747-400 co-incident with the TCAS warnings, neither crew of the conflicting aircraft were aware of the presence of the other. They were using different radio frequencies at all times and were not informed of each others position by their respective controllers. When two aircraft are similarly equipped with TCAS, the instructions for the avoidance of a collision are automatically co-ordinated between the two aircraft. By adhering to the TCAS instructions, the crews of both aircraft prevented a possible collision.

ATC Separation Monitoring Function

Subsequent reference to the ATC Separation Monitoring Function (SMF) equipment which monitors aircraft separation but is not contemporaneously displayed to controllers, recorded that at their closest proximity the two aircraft were between 600 and 700 feet apart vertically, and between 0.71 and 0.82 nm horizontally.

Missed Approach Procedures for aerodrome controllers

The Heathrow Manual of Air Traffic Services Part 2 (MATS Part 2), specifies procedures which must be adhered to in the event of a missed approach occurring at London Heathrow Airport. Both the Arrivals and Departures Controllers are required to co-ordinate with each other to establish separation between the "go-around" traffic and any conflicting departing traffic. This co-ordination was not complied with in this incident.

The Arrivals Controller, in addition to activating the alarm signifying that a missed approach has occurred, is to pass details of the aircraft carrying out the missed approach to the appropriate Heathrow Intermediate Terminal Controller stating his preferred direction of turn for the aircraft. The Terminal Controller will then issue a frequency for the aircraft to use and any heading or altitude restrictions. On this occasion the Arrivals Controller was delayed in his attempt to contact the Terminal Controller by a combination of perceived equipment malfunction and high workload.

The Departures Controller is required to suspend potentially conflicting departures until otherwise agreed with the appropriate Radar Director. In this incident, because he was not convinced that the B747-400 was actually clear of Runway 27R, the Departures Controller was constrained to issue it with a take-off clearance. This was to ensure that the runway would be available to the landing aircraft that had been switched from Runway 27L at short notice. In addition, the turn towards Epsom NDB that was given to the B747-400 after it had taken off was made without positively ensuring that it would be clear of the A300 which had carried out a missed approach.

Due to the high workload of both controllers, their Supervisor, who was aware of the missed approach was unable to intervene to assist either controller without risking a major distraction at a critical juncture.

BULLETIN CORRIGENDUM

AAIB File : EW/C96/4/5
Aircraft Types and Registrations: Airbus A300-600, A6-EKF)
Boeing 747-436, G-BNLM)
Date & Time (UTC): 15 April 1996 at 1841 hrs
Location: London Heathrow Airport
Type of Investigation: AAIB Field Investigation

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Please note that the information opposite "Persons on Board" with information opposite "Injuries" should read:

Persons on Board:	i) Crew - 16	Passengers - 289
	ii) Crew - 14	Passengers - 224
Injuries:	i) Crew - None	Passengers - None
	ii) Crew - None	Passengers - None