FINAL REPORT

INCIDENT OF SRILANKAN AIRLINES
AIRBUS A340-313, 4R-ADG
AT LONDON HEATHROW AIRPORT, UNITED KINGDOM
ON 05TH FEBRUARY 2012

Investigated by Air Accident Investigation Branch of United Kingdom

INCIDENT

Aircraft Type and Registration:	Airbus A340-313, 4R-ADG
No & Type of Engines:	4 CFM56-5C4 turbofan engines
Year of Manufacture:	2000
Date & Time (UTC):	5 February 2012 at 1113 hrs
Location:	London Heathrow Airport
Type of Flight:	Commercial Air Transport (Passenger)
Persons on Board:	Crew - 15 Passengers - 245
Injuries:	Crew - None Passengers - None
Nature of Damage:	None
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	61 years
Commander's Flying Experience:	16,600 hours (of which 2,500 were on type) Last 90 days - 300 hours Last 28 days - 100 hours
Information Source:	AAIB Field Investigation

Synopsis

The aircraft started its takeoff from a runway intersection for which no regulated takeoff weight chart was available in the aircraft. The pilots calculated performance using a chart for a different runway which did not consider obstacles relevant to the runway in use. The takeoff and subsequent flight were completed without further incident.

History of the flight

The aircraft was scheduled to fly from London Heathrow Airport to Colombo International Airport, Sri Lanka and was departing from Terminal 4. The flight deck crew comprised the commander and co-pilot, and a cruise captain[1] who was not present on the flight deck during much of the pre-flight preparation.

The pilots expected to use the full length of Runway 09R for departure but, when the co-pilot requested ATC clearance, were asked if they could accept a departure

Footnote

[1] The role of a cruise pilot is to take the place of an operating pilot during part of the cruise phase of a long haul flight, thereby enabling the operating pilot to take rest.

from the SB7 intersection. The operating pilots discussed and accepted departure from this intersection.

A RTOW chart for departure from SB7 was not available in the aircraft so the commander referred to a chart for a similar length runway at another aerodrome. The crew did not recall which aerodrome they used for this calculation. The commander calculated the takeoff speeds and the flexible temperature (T_{Flex})[2] and the co-pilot checked the calculations. The pilots entered the resulting information directly into the Multi-function Control and Display unit (MCDU).

The co-pilot suggested that, rather than carrying out a flexible takeoff, they should use full power for takeoff. After a further discussion, the crew elected to carry out the planned flexible temperature takeoff. The crew could not remember the takeoff speeds calculated or the exact T_{Flex} used and there was no requirement under EU OPS 1 for the crew to record this information. However, the commander indicated that he thought the T_{Flex} that they used was in the "low to mid thirties". The remainder of pre-flight preparation proceeded normally.

The aircraft lined up on Runway 09R via the SB7 intersection and the takeoff commenced. The aircraft was observed by the aerodrome controller (ADC) and, as it became airborne, by a photographer who was just outside the airport perimeter. The ADC assessed that the aircraft lifted off significantly closer to the end of the runway than he would expect and the photographer thought that the aircraft was noticeably lower than normal during the initial climb. Both operating pilots considered that the takeoff was in line with their expectations and experience. The cruise captain, who was sitting on the jump seat, thought that the acceleration was slightly slow and suggested applying full power; however, neither operating pilot reported hearing this suggestion and the takeoff was achieved using flexible thrust.

The remainder of the flight to Colombo proceeded without further incident.

Footnote

[2] The pilot can use flexible takeoff power when the actual takeoff weight is lower than the maximum permissible takeoff weight for the actual temperature. The maximum engine thrust, and therefore the maximum permissible takeoff weight, decreases when temperature increases, so it is possible to assume an environmental temperature at which the actual takeoff weight would be the limiting one, thereby achieving a reduced thrust for takeoff. This temperature is called *'flexible temperature'*.

Weight and balance

The aircraft takeoff weight and CG were 245,160 kg and 30.5% MAC[3] respectively; both were within normal operating limits.

Meteorology

The ATIS, recorded five minutes after the aircraft took off, indicated surface wind from 010° at 4 kt, varying between 320° and 060°, visibility greater than 10 km, few cloud at 1,000 ft, broken cloud at 1,300 ft, temperature +2°C, dewpoint 0°C and QNH 1028 hPa with, temporarily, scattered cloud at 1,400 ft.

Airfield information

At the time of the incident, the departure runway was 09R. The airport operator was expecting to initiate low visibility procedures (LVP) and Taxiway S, between SB7 and S11, was closed as a normal part of the preparation for such operations. Crews departing from Terminal 4 were offered the option of departing from the SB7 intersection or, if the aircraft required a longer runway, then they could be required to cross to the north of Runway 09R for departure. A chart of the airfield showing the SB7 intersection and the section of taxiway closed is shown in Figure 1.

Footnote

[3] Mean area chord.

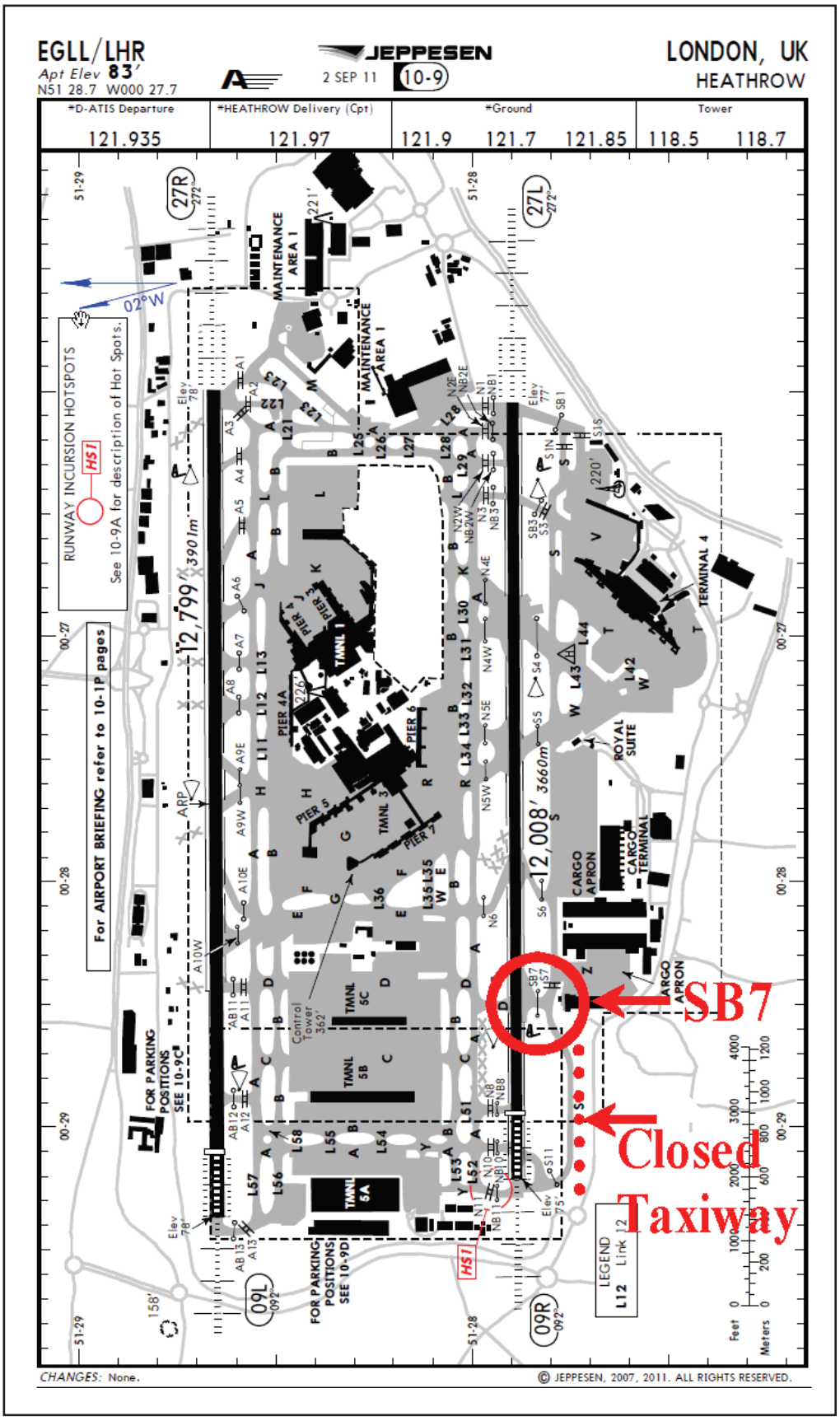

Figure 1

Heathrow Airport chart

Performance calculation

The airline instructs its pilots in two methods of calculating takeoff performance. The first method involves the use of regulated takeoff weight (RTOW) charts. Each chart is unique to a particular runway and separate charts are required for a takeoff from different intersections on the same runway. Separate charts are available for the different engine options of A340 aircraft operated by the airline. The second method involves the use of quick reference tables (QRT) in the Flight Crew Operating Manual (FCOM). These tables are generic and enable the crew to determine the takeoff performance at an airport for which no takeoff chart has been established. The tables allow runway length, slope and pressure altitude, wind and obstacles to be considered. The instructions for their use state:

> *'The determination of flexible temperature is possible only when there is no obstacle on the flight path.'*

The investigation calculated that the takeoff run required for the aircraft, based on the conditions at the time of the incident and the weight and configuration, was 2,268 m and the required maximum T_{Flex} was 38°C. The declared takeoff run available was 2,854 m.

The airline did not provide any guidance concerning alternative means of obtaining performance data if neither of the above procedures could be used.

Recorded information

A delay in the notification of this incident to the AAIB meant that the data from the takeoff had been overwritten on the flight data recorder (FDR). The operator provided the AAIB with the optical disk from the aircraft's quick access recorder (QAR); however, problems with the QAR system also meant that no flight data had been written to the disk. An analysis of the Heathrow ground movement radar did, however, indicate the approximate position at which the aircraft became airborne. The distance from intersection SB7 to this position was 2,650±50 m.

The takeoff data entered into the MCDU is not recorded by the FDR or QAR.

Analysis

The pilots did not have access to RTOW charts for a takeoff from the SB7 intersection of Runway 09R. In the absence of these charts the pilots calculated the takeoff performance using a RTOW chart for a different runway of comparable length. Data derived from a RTOW chart for a different runway may not be correct because obstacles affecting the runway in use are not considered.

If the crew had used the QRT method of calculating the takeoff performance they would have been required to carry out a full thrust takeoff as obstacles were present in the Runway 09R takeoff path.

It is possible that the aircraft was operated in accordance with the requirements for performance class A aircraft, which requires that the takeoff distance and run required should not exceed the takeoff distance and run available. The commander recalled that the approximate T_{Flex} used for the takeoff was less than the maximum allowable, and it is probable that the thrust used was sufficient to meet performance A requirements. However, the method used by the crew to obtain the performance data was not in accordance with the airline training.

Takeoff performance data was not recorded, and the crew could not recall the data they calculated. Therefore, it was not possible for the investigation to check the validity of the data used.

Safety action

The crew entered the takeoff speeds and flexible temperature directly into the MCDU during the takeoff performance calculation and did not record this data separately. Without this information, the investigation could not check the validity of the performance calculation carried out. EC 859/2008 Annex III OPS 1.1060 defines the information to be recorded on the operational flight plan but there is no requirement to record the output of the takeoff performance calculation. The completeness of the investigation was restricted by the lack of this essential data and this problem could apply to any future investigation where the calculated takeoff data may be of interest. Therefore, in order to assist future safety investigations involving takeoff performance, the following Safety Recommendation is made:

Safety Recommendation 2012-030

It is recommended that the European Aviation Safety Agency introduce a requirement for fixed wing operators holding an Air Operator Certificate to record takeoff speeds and, where they are variable, thrust and configuration settings used for takeoff and retain this information with the Operational flight plan.

Any change of regulation because of this Safety Recommendation would only apply to operators subject to EASA regulations. The operator of this aircraft was not. Therefore, the following Safety Recommendation is made:

Safety Recommendation 2012-131

It is recommended that the International Civil Aviation Organization introduce a standard or recommended practice for fixed wing aeroplanes to record the flight management system takeoff performance data entries on the flight data recorder during the takeoff phase. The data should be retained in the operator's flight data analysis programme.

As a result of this incident the airline instructed its pilots that takeoffs must not be commenced without relevant takeoff data. It specifies that a customised RTOW chart can be obtained from the dispatch centre or, if no RTOW chart can be obtained, then the QRT may be used if accurate obstacle data is available.

Conclusion

The aircraft departed from an intersection for which no performance data was available in the aircraft. The performance calculation, using a chart for a different runway, did not consider obstacles relevant to the runway in use. The operator has provided additional guidance on the procedure its pilots should follow in these circumstances.