



Incident to the AIRBUS A380-800
registered **A6-EOM**
on Friday 18 August 2023
on approach to Nice-Côte d'Azur

Time	Around 11:00 ¹
Operator	Emirates
Type of flight	Passenger commercial air transport
Persons on board	2 flight crew, 23 cabin crew, 432 passengers
Consequences and damage	Leading edge slat No 2 of RH wing damaged
This is a courtesy translation by the BEA of the Final Report on the Safety Investigation. As accurate as the translation may be, the original text in French is the work of reference.	

Damage to leading edge slat during approach

1 HISTORY OF THE FLIGHT

Note: the following information is principally based on the CVR and FDR, statements and the examinations carried out on the damaged slat.

The crew were carrying out flight EK77 between Dubai airport (United Arab Emirates) and Nice airport. On approach RNP 04L, overhead the sea at around 15 km off the coast of Cap d'Antibes, at an altitude of approximately 3,500 ft and a speed of 212 kt², the PM selected configuration 1. The pilots perceived a muffled noise followed by slight vibrations. They continued the approach and landed without any warning being activated.

On the ground, an inspection revealed that leading edge slat No 2 of the RH wing was significantly damaged: the upper and lower skin of the trailing edge was torn over around two-thirds of the slat and the honeycomb structure was partially missing.

¹ The times in this report are in Coordinated Universal Time (UTC). Two hours should be added to obtain the legal time applicable in Metropolitan France on the day of the event.

² According to the FCOM, the maximum speed for selecting configuration 1 is 222 kt.

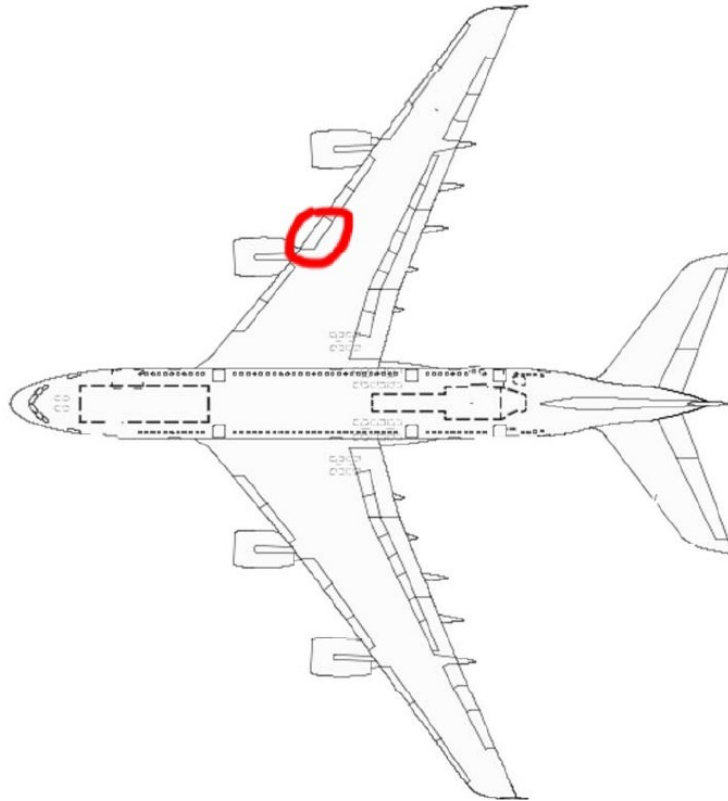


Figure 1: position of leading edge slat No 2 (source: ASR Emirates)



Figure 2: leading edge slat No 2 before disassembly (source: Airbus)

2 ADDITIONAL INFORMATION

2.1 A380 A6-EOM information

The serial number (MSN) of the Airbus A380 registered A6-OEM is MSN 187. It was delivered new to the Emirates in August 2015. At the time of the incident, it had totalled 3,084 flights for a total of 30,455 flight hours. The damaged leading edge slat was the original slat. The BEA was not informed of any major in-service work on this slat.

2.2 Examinations carried out on leading edge slats

2.2.1 Preliminary elements

The BEA initially classified the occurrence as an “accident” given the altered performance or flight characteristics that such damage might cause³.

Beyond the BEA’s obligation to open an investigation into an accident, two subjects could reinforce the importance of this investigation:

- the suspicion of a possible mid-air collision, notably with a drone;
- the possible risks and consequences associated with a large part such as the leading edge slat of an A380 separating from the aeroplane.

Immediately after the occurrence, the manufacturer, Airbus, informed the BEA that such damage had never previously occurred on the fleet of A380s in service.

In the following seven months, three other Airbus A380s operated by Singapore Airlines experienced similar damage on leading edge slats (one slat No 2 and two slat No 4s indiscriminately on RH and LH sides) when they were extended. These three occurrences did not give rise to the opening of an investigation by the authorities.

The damaged leading edge slat from the A380 A6-EOM and the slat from the first of the three following occurrences were removed and examined. These examinations, notably under UV light, did not identify signs of a bird strike. Furthermore, the deformations observed did not indicate that an impact might have caused the damage. The hypothesis of a mid-air collision with a bird or drone was therefore excluded.

2.2.2 Structure of leading edge slats on the A380

The A380 slats (as for all the Airbus aeroplanes since the A310) are composed of two distinct parts:

- a metal box including the slat leading edge, is directly connected to the wing structure by the extension/retraction mechanism and constitutes the main part of the slat;
- a trailing edge composed of a metal sandwich composite structure is riveted to the metal box.

In the event of major damage to the trailing edge as was the case in the four occurrences brought to the BEA’s knowledge, the main part of the slat remains intact and the risk of a total dislocation

³ Definition of accident based on substantial damage. See Article 2.1 b) of regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation and repealing Directive 94/56/EC and chapter 1 of Annex 13 to the Convention on International Civil Aviation.

and/or slat loss does not exist. Only fragments from the trailing edge can separate from the rest of the structure.

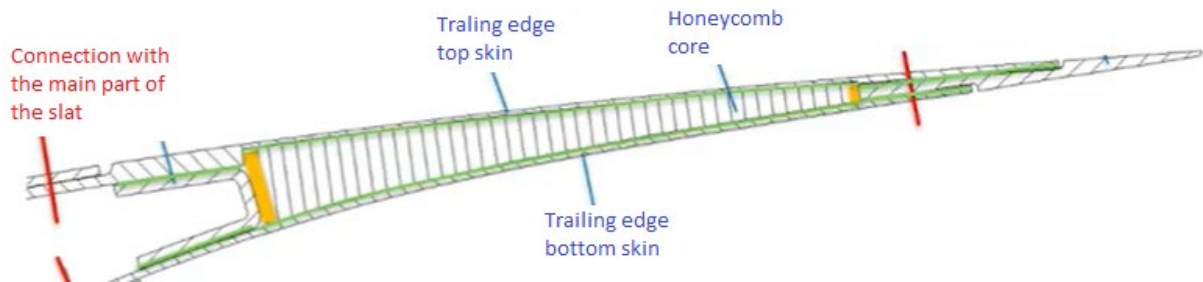


Figure 3: diagram of composite structure of trailing edge of Airbus A380 leading edge slat (source: Airbus, annotations: BEA)

2.2.3 Examinations carried out on slats

Since the Airbus A310, the slats for all the aeroplanes produced by Airbus are manufactured in Belgium by Sonaca using similar processes. The production tracking files for the damaged slats were analysed and no production deviation or problem was noted therein.

The examinations of the two removed leading edge slats identified different types of bonding rupture between the honeycomb and the skin of the slat trailing edge. Some of these ruptures were the result of the occurrence while others can be associated with bonding defects. The cause of these bonding defects has not yet been identified and Airbus informed the BEA that it was continuing to search for it as part of the continuing airworthiness, under the supervision of EASA.



Figure 4: trailing edge of Slat No 2 of the A380 A6-EOM (source: BEA)

2.2.4 Conclusions of examinations carried out

By comparing the parameters recorded during the occurrence with theoretical models, Airbus carried out simulations showing that the damage of leading edge slat No 2 had no measurable effect on the aeroplane's flight properties and performance. In particular, no loss of lift was measured that could have affected safety margins.

Considering that the performance and flight characteristics had not been altered in a measurable way, that the examinations carried out did not reveal any evidence of a collision, notably with a drone, and that the risk of a total loss of the slat was non-existent following damage to its trailing edge, the BEA decided to reclassify the occurrence as an "incident" and not to pursue the examinations.

3 CONCLUSIONS

The conclusions are solely based on the information which came to the knowledge of the BEA during the investigation.

Scenario

On changing to configuration 1 with a view to landing, when the airflow around the leading edge slats was modified, the pilots perceived a muffled noise followed by slight vibrations. They continued the approach and landed without any further incident. On the ground, an inspection revealed significant damage to the metal composite structure of the trailing edge of slat No 2 on the RH wing. The investigation established that this damage was not the consequence of a mid-air collision. It was also established that there were pre-existing bonding defects between the upper and lower skin and the honeycomb core. They may have weakened the structure.

Measures taken

Airbus recorded three other similar occurrences on the A380 in the following seven months. The manufacturer carried out examinations on the damaged slats, revealing internal structural defects which may have led to these incidents. Airbus is continuing its analysis to determine the cause of these defects. Pending conclusions, an inspection was carried out on all the A380s operated by the two operators concerned: no similar damage was observed.

Airbus plans to issue two service bulletins to all A380 operators in January 2026, to introduce repetitive inspections during A and C checks in order to identify possible cracks or delamination on a trailing edge of a leading edge slat.

The BEA investigations are conducted with the sole objective of improving aviation safety and are not intended to apportion blame or liabilities.