

## FINDINGS OF THE INVESTIGATION

The accident occurred in the context of the return of the aeroplane, registered D-AXLA and up until then leased to XL Airways Germany by its owner Air New Zealand. The leasing contract specified that maintenance and painting operations would be carried out, as well as a flight. A programme of checks had been developed by Air New Zealand based on an Airbus manual used for demonstration flights to its clients, which are performed by test and acceptance crews. The flight crew (flight number GXL888T), consisted of two pilots from XL Airways Germany, who possessed the necessary licences and ratings to undertake the flight but did not have the training, experience and methods required to perform the flight programme, even if this was not defined as a test flight. A pilot from Air New Zealand was also present in the cockpit and participated in an active manner in following the programme of checks.

This programme specifically included carrying out a check on the functioning of the low speed systems, but did not reproduce identically the Airbus programme in relation to the altitude range at which this check should be carried out

The maintenance and painting work had been carried out and checked on the premises of EAS Industries in accordance with the approved maintenance programme and by personnel qualified under the terms of the regulatory provisions. However, in order to eliminate the dust that had settled on the fuselage, a rinse with cold water was carried out on Monday 24 November 2008 without following the applicable procedure and specifically without protection of the angle of attack sensors. As a result, water penetrated into the inside of angle of attack sensors 1 and 2 and remained there until the accident flight, three days later.

On 27 November 2008, the takeoff took place at 15 h 44.

The AIP France, a publication of the aeronautical information service, specifies that flights of a specific nature must be subject to the granting of permission in advance by the Air Traffic Control Management Services (Direction des Services de la Navigation Aérienne), without which the flight may be subject to real time modifications or may possibly be refused if circumstances require. The AIP France procedure was not followed but the Captain, nevertheless, asked Perpignan ATC on the morning of the accident if the planned flight required specific airspace. The Perpignan controller indicated that this was not necessary since the crew of an XL Airways Germany Boeing 737, flight GXL032T, had been able to follow an identical flight plan without any problem that morning. However, the CRNA southwest controller (en-route ATC centre) refused the requests for manoeuvres from the Captain given that the flight plan filed did not include them.

The crew then adapted the programme of checks in an improvised manner according to the constraints imposed by the flight plan and the air traffic control services.

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Angle of attack sensors 1 and 2 had stopped moving at identical values during cruise through freezing of the water present inside the sensors' casing. In fact, the application of a jet of water onto an aeroplane without following the recommended procedure can allow penetration into an angle of attack sensor of a small quantity of water that would be sufficient, when frozen, to block them.

During the approach, the crew decided, without preparation, and specifically without any callout of the theoretical minimum speeds indicated in the document at their disposal, to undertake the check on the angle of attack protections in normal law at an altitude of about 4,000 feet. However, the blockage of angle of attack sensors 1 and 2 at identical values had inhibited the functioning of these protections and led to an erroneous display of the characteristic speeds of these protections.

The crew waited for these protections to be triggered while allowing the speed to decrease. The first triggering of the stall warning in normal law, at an angle of attack close to the theoretical angle of attack in landing configuration, indicates that angle of attack sensor 3 was functioning at that moment. The Captain reacted in accordance with the technique for approach-to-stall by increasing engine thrust and reducing longitudinal pitch.

Shortly after this, the flight control law changed from normal to direct due to a difference in the speed measurements. For this reason, after having progressively moved the horizontal stabiliser to the full pitch-up position during the deceleration, the autotrim system was no longer available. The horizontal stabiliser remained in this position until the end of the flight. Under the combined effect of the thrust and the increase in speed, the aeroplane was subject to a pitch-up moment that the Captain was not able to counter. The Captain did not react with any input on the trim wheel at any time or to reduce engine thrust in any prolonged manner.

Due to the position of the stabilizer and the pitch-up moment generated by the engines at full thrust, the crew lost control of the aeroplane during the increase in thrust. The aeroplane was completely destroyed on impact with the surface of the sea.