

# Investigation Report

5X008-0/00  
June 2002

## Factual Information

Type of occurrence:	Serious incident
Date:	01. October 2000
Location:	Düsseldorf
Aircraft:	Transport category aeroplane
Manufacturer/Model:	Canadair Limited / CL-600-2B19
Injuries to Persons:	no injuries
Damage:	aeroplane not damaged
Other damage:	none

### History of flight

The aeroplane had departed at 15:06 hrs<sup>1</sup> from Düsseldorf for a scheduled flight to Göteborg (Sweden). 4 crew members and 43 passengers were aboard the aeroplane. Shortly after the departure the flight crew switched on the autopilot (AP). During climb at flight level (FL) 260 - the outside air temperature was appr. -30°C - the warning "AP is RWD" (AP mistrimmed to the right) appeared on the information display (EICAS). Shortly before warning appeared the aileron flag indicating mistrim had appeared on the primary flight display (PFD). In compliance with the procedures indicated in the handbook (QRH) the crew switched off the AP and in straight level flight found that the aeroplane was not mistrimmed to the right. After reactivation of the AP the same warning appeared again. In accordance with the provisions in the handbook ("abnormal procedure"), the flight was

continued with the aeroplane being controlled manually. During a right turn prescribed by ATC, the crew found that the controls could hardly be moved to the right. The EICAS ("Flight Control Page") indicated that the left aileron was displaced normally whereas the right aileron did not move. The crew intended to carry out the "Jammed Aileron Procedure" in accordance with the handbook. However, before they started with the a.m. procedure, there was a sudden jerk during a turn, and the aileron was smoothly movable again. The AP could be reactivated without any problems. For reasons of safety, the pilot in command decided not to continue the flight to the intended destination airport but to land at Cologne-Bonn.

### Investigation

The BFU was notified of the incident by Fax only on 9. October 2000. For the investigation the flight data recorder (FDR) was not available as it had not been removed by the operator.

Following the landing at Cologne-Bonn, the operator performed a detailed visual inspection as well as a functional check of the complete aileron system. During all these checks and tests no findings were made. As according to the statements of the crew at the time of take-off there was rain with a wet runway and icing of the aeroplane during the climb to cruise altitude, the technician of the operator assumed temporary jamming of the aileron due to icing and released the aeroplane service.

On the aeroplane manufacturer's advice the documentation was reviewed with respect to maintenance work carried out on the aileron system in the past and another visual inspection was performed. This review and the inspection were carried out on 28. October 2000 and no findings were made.

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<sup>1</sup> All hours in LT

The BFU contacted the Transportation Safety Board (TSB) in Canada and was informed that during recent times (6. June and 16. August 2000) also in the USA two incidents of this kind ("aileron stiffness") involving this aeroplane type had occurred. At that time the Canadian certification authority (Transport Canada) already performed their own investigations in cooperation with the NTSB, which were concluded on 28. August 2000 with the issue of the Airworthiness Directive (AD) CF-2000-28 effective on 29. September 2000. Subject of this AD was the installation of a splash shield in the main landing gear bay of aeroplanes not equipped yet with such a shield as a protection of the aileron quadrants / control cable pulleys against snow or slush on the runway.

On 2. November 2000 the Luftfahrt-Bundesamt (LBA) issued the Canadian AD as the Lufttüchtigkeitsanweisung (LTA) no. 2000-335.

However, the aeroplane affected by the incident on 1. October 2000 had already been equipped on 1. February 2000 by the operator with an adequate shield on the basis of a Service Bulletin (SB) 601 R-27-104 issued on 15. October 1999 by the manufacturer.

During an enquiry the pilot in command declared that at the moment of the take-off in Düsseldorf the runway was wet and partly covered with puddles of water. At appr. 3500 to 4000 ft the aeroplane entered the clouds and left them at appr. FL 120. At FL 80 the ice detector indicated to the crew ice accumulation on the aeroplane. At that time the temperature (TAT) was appr. -8°C. The crew assessed the degree of icing to be moderate.

From an expertise prepared by the Deutscher Wetterdienst (German Meteorological Service) it could be seen that in the period between 02:00 hrs and 08:00 hrs a precipitation quantity of 3.2 mm and between 08:00 hrs and 14:00 hrs a precipitation quantity of 17.3 mm had been registered on Düsseldorf Airport.

At the time of departure from the airport there were bad-weather clouds consisting of several layers. The ceiling was appr. 900 ft AGL (Above Ground Level). The top of the existing frontal clouds may have been between FL 200 and FL 250. With the existing cloud conditions it must be assumed that the aeroplane was in clouds throughout the whole climb.

Within the existing clouds slight to moderate icing occurred with reaching the freezing level at appr. FL 80. The Significant Weather Chart (SWC) indicated moderate icing for the European region.

## Analysis

According to the technical findings made by the operator it is to be assumed that the incident had not been caused by a technical defect of the aeroplane.

According to the meteorological expertise and the statements of the crew, during climb to cruise level moderate icing occurred on the aeroplane.

During the take-off run on the runway covered with puddles, water accumulated on the aileron quadrants / control cable pulleys in the main landing gear bay of the aeroplane. When the temperature decreased during climb the control cable pulleys most probably had frozen up. This in turn led to a temporary jamming of the right aileron as well as to the indications observed by the crew in the cockpit.

The splash shield installed in this aeroplane as a protection of the aileron quadrants / control cable pulleys against snow or slush obviously is not sufficient as a protection against water accumulations in the case of wet runways. With the corresponding temperatures these accumulations may freeze and result in jamming or restricted functionality of the ailerons.

## Conclusions

The incident is due to the fact that icing in climb had caused the aileron quadrants / control cable pulleys in the main landing gear bay to freeze up thus blocking the right aileron. Obviously the modification instruction (SB 601R-27-104) issued by the manufacturer for the aeroplane type is not sufficient.

## Safety Recommendation

Recommendation no. 10/2000

The Luftfahrt-Bundesamt should contact the manufacturer of the aeroplane CL-600-2B19 concerning the effectivity of the protection (shield) installed.

Investigator-in-charge Krupper