

SYNOPSIS

SERIOUS INCIDENT

Aircraft: registration and model	SE-MAP, British Aerospace Systems Ltd.
Class/Airworthiness	Normal/Certificate of Airworthiness and valid Airworthiness Review Certificate (ARC).
Owner/Operator	Trident Aviation Leasing Services, P.O. Box 727, St. Paul's Gate, new Street, St Helier JE4 8ZB, Jersey, England/West Air Sweden AB, Box 5433, 402 29 Göteborg.
Time of occurrence	11-01-2010, 19.00 hrs, in darkness. Note: all times give in Swedish standard time (UTC + 1 hour)
Place	Helsinki/Vantaa Airport, Finland (pos. 6019N 02458E; 51 m over sea level)
Type of flight	Commercial air transport (cargo)
Weather	According to METAR EFHK at 18.50 hrs: Wind 170°/12 kts; visibility over 10 km in snow; broken clouds with base at 1100 ft; temp./dp M02/M04 °C, QNH 1001 hPa
No. of persons on board:	
crew members	2
passengers	—
Injuries to persons	None
Damage to aircraft	None
Other damage	None

A cargo aircraft of type BAe ATP was to fly from Helsinki to Copenhagen. Owing to the prevailing weather conditions, the aircraft had undergone a two-step deicing prior to departure. In the two-step deicing procedure, hot water is mixed with glycol (Type I fluid) to remove ice, frost and snow from critical surfaces on the aircraft; after this, a fluid containing thickening agent (Type II/IV) is applied, to prevent ice from reforming.

At takeoff, the control column could not be pulled back when the rotation speed was reached, and the pilot felt that the elevator movement was restricted. Takeoff was aborted and the aircraft taxied back to the apron. Once SHK's investigation had started, it was discovered that several similar incidents involving the same type of aircraft and similar conditions had occurred. Following an initial technical inspection, it could be noted that the individual craft which had experienced these incidents shared certain common

denominators: deicing with Type II/IV, combined with too narrow a gap between the stabiliser and elevator, were determining factors in the incidents. In collaboration with one of the operators, SHK has carried out a series of tests to recreate and document the phenomenon. The test results verified the connection between too small an elevator hinge gap and elevator restrictions, in situations where deicing had been carried out using fluids containing thickening agents.

The investigations also showed that the process for drawing up specifications and requirements for deicing fluids is, to a certain extent, controlled by trade organisations. The investigation found, too, that at present no monitoring or specific inspection activities relating to these fluids are carried out by any pan-European aviation safety body. Neither is there any authorisation process, or any set certification rules, with regard to the types of aircraft which can/may use different types of deicing fluids.

The incidents involving elevator restrictions were caused by a phenomenon which, for unknown reasons, occurs following the use of anti-icing fluids containing thickening agents, on individual aircraft where the stabiliser and elevator are too close together. One contributory factor was the fact that there were shortcomings in that part of the aircraft's type certification exercises that concerned anti-icing.