



Air Accident Investigation Unit Ireland

**SERIOUS INCIDENT
PA 31-350, G-VIPY,
Near LIFFY reporting point
in Dublin CTA,
9 February 2011**



**An Roinn Iompair
Turasóireachta agus Spóirt**

Department of Transport,
Tourism and Sport

AAIU Report No: 2011-020

State File No: IRL00911012

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In accordance with the provisions of SI 460 of 2009, the Chief Inspector of Air Accidents, on 9 February, 2011, appointed Mr. Paul Farrell as the Investigator-in-Charge to carry out a Field Investigation into this Serious Incident and prepare a Report. The sole purpose of this Investigation is the prevention of aviation Accidents and Incidents. It is not the purpose of the Investigation to apportion blame or liability.

Aircraft Type and Registration:	PA 31-350, G-VIPY
No. and Type of Engines:	1 x LYCOMING TIO-540-J2BD 1 x LYCOMING LTIO-540-J2BD
Aircraft Serial Number:	31-7852143
Year of Manufacture:	1978
Date and Time (UTC):	9 February 2011 @ 08.30 hrs
Location:	Near LIFFY reporting Point in Dublin CTA
Type of Flight:	Cargo
Persons on Board:	Crew - 1 Passengers - 0
Injuries:	Crew - 0 Passengers - 0
Nature of Damage:	Minor
Commander's Licence:	UK JAA Commercial Airplane
Commander's Details:	Male, aged 34 years
Commander's Flying Experience:	2.700 hours, of which approximately 1,000 were on type
Notification Source:	Dublin ATC
Information Source:	Notification from Dublin ATC, AAIU Field Investigation, AAIU Report Form submitted by Pilot



SYNOPSIS

The aircraft experienced violent rolling motion due to the partial separation of the inboard section of the starboard de-icing boot. The partially separated portion of the de-icing boot flailed in the airflow impacting and damaging the starboard wing, flap and aileron, and causing significant handling challenges for the Pilot. When the de-icing boot fully separated normal handling returned. The separated portion of the de-icing boot was not recovered.

1. FACTUAL INFORMATION

1.1 History of the Flight

The aircraft departed East Midlands Airport, UK (EGNX) at 07.25 hrs on a scheduled cargo flight to Weston Aerodrome, Co. Dublin (EIWT). During the initial descent the Pilot activated the de-icing boots and noted a slight shudder, but had no other adverse indications. About 10 minutes later the aircraft suddenly experienced a violent rolling motion, but had no adverse pitch movements. The Pilot scanned outside the aircraft and noted that the starboard de-icing boot had partially detached and was flailing against the wing and aileron **(Photo No. 1)**.



Photo No. 1: De-ice boot peeling (stall warning vane marked in red)

The Pilot reported that he had a good deal of difficulty controlling the aircraft, and he declared a PAN on the Dublin frequency. Dublin ATC immediately offered the Pilot the option to land at Dublin. The Pilot accepted this offer due to the fact that the Dublin runway was longer and wider than those available at EIWT. The Pilot realised that he was both high and fast for an approach to Dublin so he requested Dublin ATC to give him a vectored delay to allow him the time he needed to prepare and configure for the Dublin approach.

The Pilot then noticed that most of the problems he had been experiencing had ceased. On looking out at the starboard wing he noted that the detached portion of the de-icing boot had separated from the aircraft and consequently his control of the aircraft was no longer being actively compromised. Consequently, the Pilot cancelled his PAN and asked ATC for clearance to continue his original approach to EIWT, for which he felt he was better positioned. ATC facilitated his request.

The Pilot noted that at the same time as the control problems ceased the red landing gear warning light came on, although he felt none of the usual "bumps" associated with landing gear movement. He lifted the gear handle and moved it quickly to neutral, whereupon the light went out. Later in the approach, as a precaution, the Pilot slowed the aircraft and tested the gear, which he found to be serviceable. The aircraft subsequently landed uneventfully at EIWT.

1.2 AAIU Field Investigation

Two Inspectors of Accidents travelled to EIWT to inspect the aircraft and interview the Pilot. On examination it was found that the inboard section of the starboard de-icing boot 1.55 m long had effectively "peeled" away from the leading edge and flailed, causing damage and marking to the starboard wing upper surface (**Photo No. 2**), the starboard aileron upper surface (**Photo No. 3**) and the outboard section of the starboard flap. The "peeling" appeared to be arrested by the presence of the stall warning vane and its attachment bracket.



Photo No. 2 : Damage to the wing upper surface



Photo No. 3: Damage to the starboard aileron

Maintenance records were examined and showed that the Starboard De-icer boot was fitted on a Check 3, dated 09/03/07 at 10694:15 airframe hours. Both the boot and the adhesive were obtained from approved sources and were in date. Scheduled Inspections are at the 'A' check (Daily), carried out by the Pilot, and at the 200hr Base Maintenance check. Both checks are visual.

Operational checks are also carried out by the Crew during cockpit checks and post maintenance by the maintainers. No defects had been recorded during Scheduled Inspections. The only non-scheduled maintenance carried out on the boot since installation was a repair to a hole, just outboard of the engine nacelle on 04/10/10 and re-gluing of the Stall Strip on the 23/12/10, at the Check 4. Examination of the exposed wing surface revealed no findings of consequence. Following separation the detached portion of the boot was not recovered as it fell into the Irish Sea, and consequently it was not possible to examine it.

Inspection of the aircraft and examination of the maintenance records indicated that the aircraft was well maintained and offered no likely reason for the separation of the de-icing boot.

2. ANALYSIS

The aircraft was well maintained and in the absence of the failed portion of the de-icing boot neither the failure mode nor the reason for the failure could be definitively determined.

3. CONCLUSIONS

(a) Findings

1. The aircraft experienced violent rolling motion due to the partial separation of the inboard section of the starboard de-icing boot.
2. The Pilot reported that he had a good deal of difficulty controlling the aircraft.
3. The "peeled" section of the starboard de-icing boot flailed, causing damage and marking to the starboard wing upper surface, the starboard aileron upper surface and the outboard section of the starboard flap.
4. The control difficulties ceased when the partially detached portion of the de-icing boot separated from the aircraft.
5. An unexplained landing gear light illumination accompanied the cessation of the control difficulties.
6. Cycling of the landing gear corrected the landing gear light problem.
7. The separated portion of the de-icing boot was not recovered.

(b) Probable Cause

Partial detachment and flailing of the inboard section of the starboard de-icing boot.

4. SAFETY RECOMMENDATIONS

This Investigation does not sustain any Safety Recommendations.

In accordance with Annex 13 to the International Civil Aviation Organisation Convention, Regulation (EU) No 996/2010, and Statutory Instrument No. 460 of 2009, AIR NAVIGATION (NOTIFICATION AND INVESTIGATION OF ACCIDENTS, SERIOUS INCIDENTS AND INCIDENTS) REGULATION, 2009, the sole purpose of these investigations is to prevent aviation accidents and serious incidents. It is not the purpose of any such accident investigation and the associated investigation report to apportion blame or liability.

A safety recommendation shall in no case create a presumption of blame or liability for an occurrence.

Produced by the Air Accident Investigation Unit

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