Air Accident Investigation Unit Ireland

SYNOPTIC REPORT

ACCIDENT

FAIRCHILD - SA227AC Metro III, D-CAVA

Dublin Airport, Ireland (EIDW)

7 March 2013

An Roinn Iompair Turasóireachta agus Spóirt

Department of Transport, Tourism and Sport

FINAL REPORT

AAIU Report No: 2013-010
State File No: IRL00913022
Report Format: Synoptic Report
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In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No. 996/2010 and the provisions of S.I. 460 of 2009, the Chief Inspector of Air Accidents, on 7 March 2013, appointed Mr. Paul Farrell as the Investigator-in-Charge to carry out an Investigation into this Accident 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:	FAIRCHILD - SA227AC Metro III, D-CAVA
No. and Type of Engines:	2 x TPE331-11
Aircraft Serial Number:	AC 758 B
Year of Manufacture:	1990
Date and Time (UTC):	7 March 2013 @ 08:33 hrs
Location:	Dublin Airport, Co. Dublin, Ireland (EIDW)
Type of Operation:	Cargo
Persons on Board:	Crew - 2 Passengers – 0
Injuries:	Crew - 0 Passengers – 0
Nature of Damage:	Substantial
Commander's Licence:	Commercial Pilot Licence, Aeroplanes (CPL, A)
Commander's Details:	Male, aged 31 years
Commander's Flying Experience:	3,570 hours, of which 2,630 were on type
Notification Source:	Duty Manager, EIDW
Information Source:	AAIU Field Investigation, AAIU Report Form submitted by Pilot

SYNOPSIS

During the landing roll, the landing gear selector was inadvertently moved to the UP position. This mistake was immediately recognised and the selector was returned to the DOWN position but the nose-wheel, which had started to retract, continued retracting, resulting in substantial damage to the aircraft.

1. FACTUAL INFORMATION

1.1 History of the Flight

The aircraft was on a cargo flight from Manston International Airport, UK (EGMH) to Dublin Airport (EIDW). The aircraft was cleared to land on Runway (RWY) 10 at EIDW. The approach was a CAT 1 approach. Weather conditions at EIDW were poor with visibility approximately 1,100 metres (m) and a cloudbase of approximately 300 ft. EIDW was operating in low visibility abeyance. Runway Visual Ranges (RVRs) at 08:28 hrs were 1,600 m at touchdown, 1,800 m at midpoint and 1.600 m at stopend. The Flight Crew informed the Investigation that the aircraft broke out of cloud at about 650 ft, approximately 200 ft above the minimum for the CAT 1 approach, and they could see three white Precision Approach Path Indicator (PAPI) lights.

As per normal procedure, after landing the First Officer who was Pilot Flying (PF) gave the controls to the Captain who was Pilot Not Flying (PNF) so the he (PF) could complete the "Leaving the Runway" checklist. This checklist is completed from memory and included booster pump and flap-to-zero selections. The PNF recalled that during the landing roll, while the aircraft was braking and the indicated airspeed was below 90 kts, the nose gear suddenly collapsed. Both propellers contacted the runway surface and the aircraft quickly came to a halt resting on its nose (**Photo No. 1**). The Flight Crew then shutdown both engines, requested fire service assistance, selected batteries & generators to OFF and evacuated the aircraft through the cabin door.

Photo No. 1: D-CAVA as it came to rest on RWY 10

The Airport Fire Fighting personnel were on the scene within two minutes. There was no fire.

The PF informed the Investigation that it was a foggy day and that the approach was flown on limits with a lot of tension because of the uncertainty as to whether the aircraft would be able to land at EIDW. He described how concerns that fog might roll in raised his stress levels during the approach. During the landing roll, the landing gear selector was inadvertently moved to the UP position. This mistake was immediately recognised and the selector was returned to the DOWN position, but the nose-wheel retraction, which had been initiated, continued. The PF was unable to say definitively why the landing gear selector may have been mis-selected to UP, but he said that the intention may have been to move the Flap Selector instead.

1.2 Follow-up Activities

The aircraft came to rest blocking RWY 10. Airport Fire Services and other Dublin Airport Authority personnel deployed specialist equipment to lift the aircraft without causing further damage. On lifting the aircraft the nose wheel easily returned towards the extended position and with a small mechanical effort was placed in the locked down position. With the gear locked down the aircraft was towed to a remote location on the airfield and following inspection RWY 10 was re-opened.

1.3 Crew Details

Commander (PNF)	
Licence:	Commercial Pilot Licence, Aeroplanes (CPL, A)
Details:	Male, aged 31 years
Flying Experience:	3,570 hours, of which 2,630 were on type
First Officer (PF)	
Licence:	Commercial Pilot Licence, Aeroplanes (CPL, A)
Details:	Male, aged 26 years
Flying Experience:	1,296 hours, of which 1,086 were on type

1.4 Investigation Activities

While lifting the aircraft an Inspector of Air Accidents was present in the cockpit with the Captain. It was noted that the landing gear system and indications were functioning normally.

The Investigation later tested the landing gear interlock system in the presence of the Operator's Technical Manager. The system was found to be serviceable. In particular it was noted that with weight on the landing gear the interlock system was effective in preventing the landing gear lever from being moved out of the DOWN position.

The aircraft's maintenance documentation and history were examined and no anomalies were found.

2. ANALYSIS

2.1 Landing Gear System

Cockpit indications, post-accident testing and aircraft maintenance documentation all indicate that the landing gear system was serviceable. It seems likely that the reason that the interlock system did not prevent the landing gear selector being moved to the UP position was that the airspeed at the time was high enough to provide sufficient lift (insufficient weight on wheels) to prevent the interlock system from activating. The Investigation is aware of other events involving different aircraft types where similar accidents involving inadvertent retraction of the landing gear at speed led to nose wheel collapse.

2.2 PF Lapse

The PF suggested that the intention may have been to move the flap selector and that inadvertently the landing gear selector was moved instead.

The Investigation considered the ergonomics and layout of the cockpit pedestal. **Photo No. 2** shows the pedestal with the landing gear selector (red), flap selector (green) and booster pump switches (purple) ringed. The Investigation noted that both selectors are lever actuated. The Investigation further noted that whilst the gear and flap selector knobs are coloured white, the knob geometry is different (circular for the landing gear, rectangular for the flap).

The Investigation observed that the selectors are not in close proximity being located on diagonally opposite corners of the pedestal. Consequently, the Investigation does not believe that there is any obvious visual mis-cueing or co-location of landing gear and flap selectors which may have prompted the mis-selection.

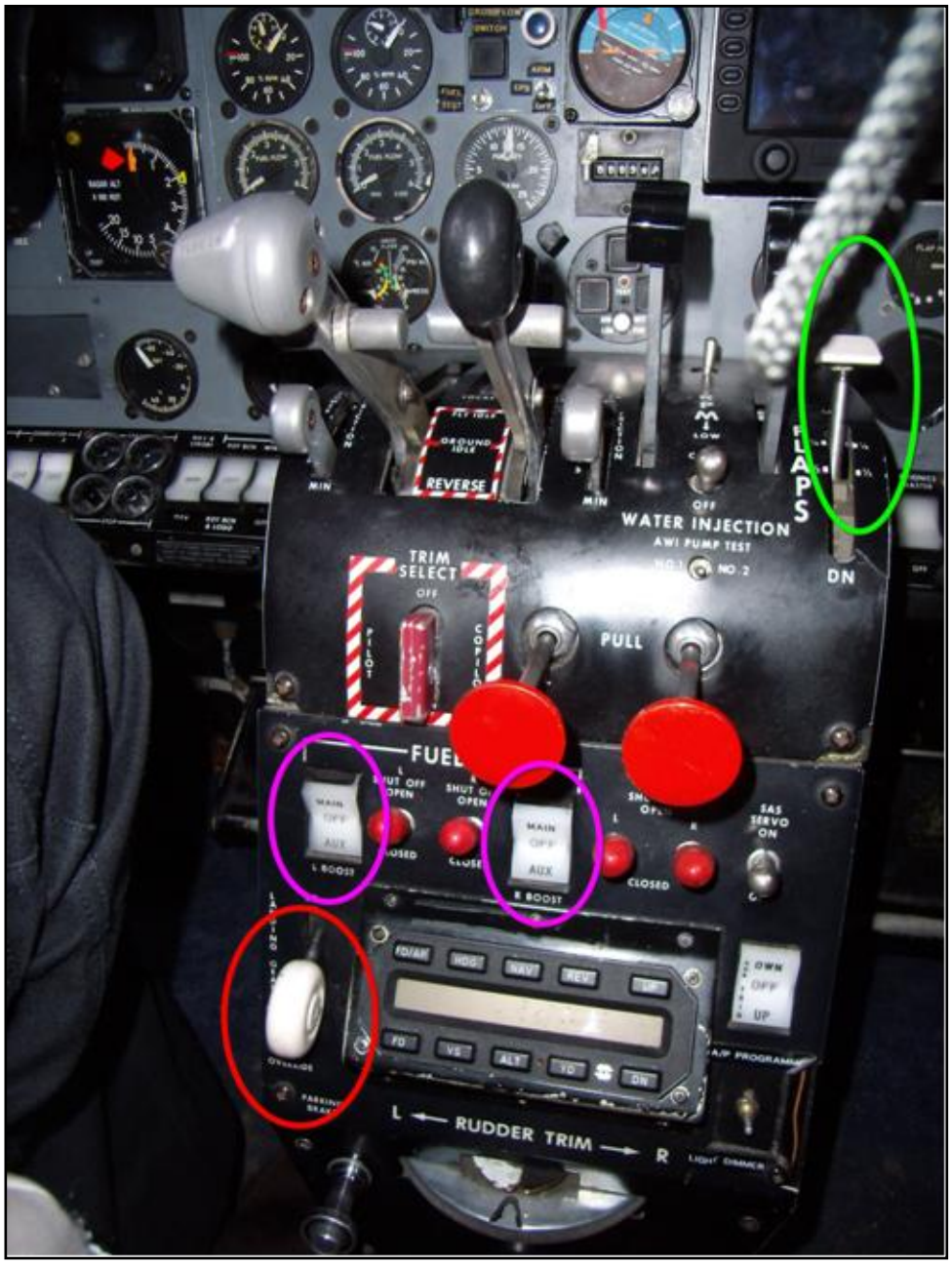

Photo No. 2: Positions of landing gear (red), flap (green) and booster pump (purple) selectors

The Investigation noted that the booster pump selectors are white coloured and located above the landing gear selector. The Flight Crew stated that booster pumps were one of the memory item checks to be completed prior to leaving the runway, so attention would have moved to that area of the pedestal. However, the nature of the selectors is different; the landing gear is a single lever whilst the booster pumps are selected via two separate 3-position switches. Consequently, the Investigation believes that, notwithstanding their close proximity on the cockpit pedestal, there is no obvious visual mis-cueing of landing gear and booster pump selectors which may have prompted the mis-selection.

Whilst it is not possible to be definitive as to why the landing gear selector was moved to the UP position, the PF described feelings of tension and stress associated with the limits approach he flew into EIDW due to the poor weather conditions. It is possible that following the successful landing, and the associated relief of tension and stress, the PF may have relaxed leading to a reduced level of task attention as he went through his checks prior to leaving the runway. This reduced level of task attention probably facilitated the lapse whereby the landing gear selector was incorrectly moved to the UP position. The immediate recognition and rectification of this lapse was too late to prevent the retraction of the nose wheel.

3. CONCLUSIONS

(a) Findings

1. Weather conditions at EIDW were poor with forecast fog and low visibility.

2. The aircraft completed a limits approach and successful landing on RWY 10.

3. The landing gear was selected to up momentarily during the landing roll.

4. The nose wheel retracted causing both propellers to strike the runway.

5. The aircraft came to rest blocking RWY 10.

6. The airport fire fighting services attended the aircraft within 2 minutes.

7. There was no fire.

8. There were no injuries.

9. Testing confirmed that landing gear cockpit indications and the interlock system were serviceable.

10. The PF could not provide any explanation for his lapse in selecting the landing gear to UP.

11. Examination of the cockpit pedestal did not reveal any specific design concerns which may have contributed to the lapse.

12. Relaxation following the tension and stress of the limits approach may have led to reduced task focus by the PF during checks prior to leaving the runway.

(b) Probable Cause

1. Inadvertent selection of the landing gear selector to the UP position during the landing roll.

(c) Contributory Cause(s)

1. Reduced task focus by the PF following a tense and stressful limits approach.

2. Inactive landing gear interlock protection system due to the aircraft speed.

4. SAFETY RECOMMENDATIONS

This Investigation does not sustain any Safety Recommendations.

- END -

In accordance with Annex 13 to the Convention on International Civil Aviation, 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 this investigation is to prevent aviation accidents and serious incidents. It is not the purpose of any such 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

AAIU Reports are available on the Unit website at www.aaiu.ie

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