Air Accident Investigation Unit Ireland

FACTUAL REPORT

ACCIDENT

Cessna 140, EI-AEM

Snug Beag Airfield, Co. Westmeath

2 June 2018

An Roinn Iompair
Turasóireachta agus Spóirt
Department of Transport,
Tourism and Sport

Foreword

This safety investigation is exclusively of a technical nature and the Final Report reflects the determination of the AAIU regarding the circumstances of this occurrence and its probable causes.

In accordance with the provisions of Annex 13[1] to the Convention on International Civil Aviation, Regulation (EU) No 996/2010[2] and Statutory Instrument No. 460 of 2009[3], safety investigations are in no case concerned with apportioning blame or liability. They are independent of, separate from and without prejudice to any judicial or administrative proceedings to apportion blame or liability. The sole objective of this safety investigation and Final Report is the prevention of accidents and incidents.

Accordingly, it is inappropriate that AAIU Reports should be used to assign fault or blame or determine liability, since neither the safety investigation nor the reporting process has been undertaken for that purpose.

Extracts from this Report may be published providing that the source is acknowledged, the material is accurately reproduced and that it is not used in a derogatory or misleading context.

[1] **Annex 13**: International Civil Aviation Organization (ICAO), Annex 13, Aircraft Accident and Incident Investigation.
[2] **Regulation (EU) No 996/2010** of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation.
[3] **Statutory Instrument (SI) No. 460 of 2009**: Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulations 2009.

AAIU Report No: 2019 - 006
State File No: IRL00918034
Report Format: Factual Report
Published: 24 May 2019

In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No 996/2010 and the provisions of SI No. 460 of 2009, the Chief Inspector of Air Accidents on 2 June 2018, appointed Paul Farrell as the Investigator-in-Charge, assisted by Clive Byrne, Inspector of Air Accidents, to carry out an Investigation into this accident and prepare a Report.

Aircraft Type and Registration:	Cessna 140 (Modified), EI-AEM
No. and Type of Engines:	1 x Continental O-200-A
Aircraft Serial Number:	13744
Year of Manufacture:	1947
Date and Time (UTC)[4]:	2 June 2018 @ 18.35 hrs
Location:	Snug Beag Airfield, Near Delvin, Co. Westmeath
Type of Operation:	General Aviation
Persons on Board:	Crew - 1 Passengers - Nil
Injuries:	Crew - Minor
Nature of Damage:	Substantial
Commander's Licence:	Private Pilot Licence (PPL) Aeroplanes (A) issued by the Federal Aviation Administration (FAA)
Commander's Age:	38 years
Commander's Flying Experience:	237 hours, of which 32 were on type
Notification Source:	Pilot In Command
Information Source:	AAIU Field Investigation, AAIU Report Form submitted by the Pilot

[4] **UTC**: Co-ordinated Universal Time. All timings in this report are quoted in UTC; (Local time was UTC + 1 hour on the date of the accident).

SYNOPSIS

Whilst landing at a private airfield, near Delvin, Co. Westmeath, the Cessna 140 aircraft, with one Pilot on board, experienced a bounced landing. Following the bounced landing, the Pilot applied the brakes in an attempt to bring the aircraft to a halt. The aircraft subsequently pitched forward, overturned and came to rest, inverted, on the runway. The Pilot sustained minor bruising. There was no fire.

NOTIFICATION

The AAIU was notified of this accident by the Pilot.

1. FACTUAL INFORMATION

1.1 History of the Flight

The tail-wheeled Cessna 140 aircraft departed from Ballyboy Airfield (EIMH), Co. Meath at 18.25 hrs. The Pilot, who was the sole occupant, departed with the intention of landing at a nearby private airfield known locally as Snug Beag, which is approximately five nautical miles west of EIMH.

According to the Pilot, on the occurrence flight the aircraft flew overhead Snug Beag Airfield at 18.35 hrs and made a steep approach to runway (RWY) 19 at 50 knots (kts) with full flaps selected. The aircraft touched down on rising ground approximately 50 metres (m) past the threshold of the runway, where the aircraft experienced a bounced landing. The Pilot informed the Investigation that he was *"familiar with the airfield and knew the ESB cables committed him to his landing. Going around was not an option…"* Therefore, the Pilot was committed to landing the aircraft once the bounced landing was experienced.

The Pilot said *"he arrested the bounce with power, rolling out in a level attitude on a downward section of runway"*. In addition, the Pilot applied full back elevator, in order to keep the tail-wheel in contact with the runway while maintaining directional control of the aircraft through the rudder. At approximately 175 m from the threshold of RWY 19, the Pilot applied the brakes. The aircraft pitched forward, overturned and came to rest inverted on the runway pointing back in the direction from which it came (**Photo No. 1**). The Pilot exited the aircraft having sustained minor bruising during the accident.

Photo No. 1: Final resting position of EI-AEM on RWY 19

1.2 Aircraft Information

EI-AEM is a Cessna 140 (Modified) built in 1947. It is a single-engine, two-seat, high-wing aircraft with a fixed undercarriage of tail-wheel configuration and was fitted with main landing gear extenders. The aircraft is fitted with a 100 Horsepower, 4 cylinder Continental O-200-A engine. It was operated on a Flight Permit, with the most recent Permit issued by the Irish Aviation Authority (IAA) on 4 April 2018. The Permit was valid at the time of the accident.

1.3 Damage to Aircraft

The aircraft sustained substantial damage as a result of the accident. The engine, propeller and forward fuselage suffered impact damage (**Photo No. 2**), the starboard wing strut was buckled (**Photo No. 3**) and the leading edge of the port wing tip area had impact damage evident (**Photo No. 4**). The tail sustained significant creasing and buckling to the vertical stabiliser and rudder area (**Photo No. 5**).

Photo No. 2: Damage to propeller blades and engine fairings

Photo No. 3: Damage to starboard wing strut

Photo No. 4: Damage to port wing leading edge

Photo No. 5: Damage to vertical stabiliser and rudder

1.4 Meteorological Information

The Pilot reported to the Investigation that weather conditions at the time of the occurrence were dry, with clear skies and variable winds of 2-3 kts on the ground.

1.5 Pilot Information

The Pilot held a PPL (A) licence issued by the FAA on 29 July 2013. At the time of the accident the Pilot had 237 hours flying experience, of which 32 hours were on the accident type. The Pilot's licence had the correct VFR[5] endorsement and was valid at the time of the accident in accordance with 14 CFR 61.56[6] requirements and was therefore permitted by the IAA to fly an Irish registered, Annex II, Flight Permit aircraft at the time of the accident.

Age:	38 years
Licence:	PPL (A)
Total all Types	237.0 hours
Last 90 Days:	9.2 hours
Last 28 Days:	5.0 hours
Last 24 Hours:	0.3 hours
Total on Accident Type:	32.0 hours

[5] **VFR:** Visual Flight Rules.
[6] 14 **CFR 61.56:** Code of Federal Regulations, Section 61.56.

1.6 Airfield Information

Snug Beag is a privately owned unlicensed airfield on farm-land, between Delvin Co. Westmeath and Athboy Co. Meath. The airfield has two grass runways, comprising a minor runway of 200 m in length, which is orientated in a direction of 14/32 and a main runway of 350 m in length, which is orientated in a direction of 01/19 (**Figure No. 1**). The runway grass was short and the surface conditions were reported as dry by the Pilot. The northerly approach onto the main runway (RWY 01) is obstructed by trees and electricity wires at the runway threshold. The Pilot had obtained prior permission to land at the airfield.

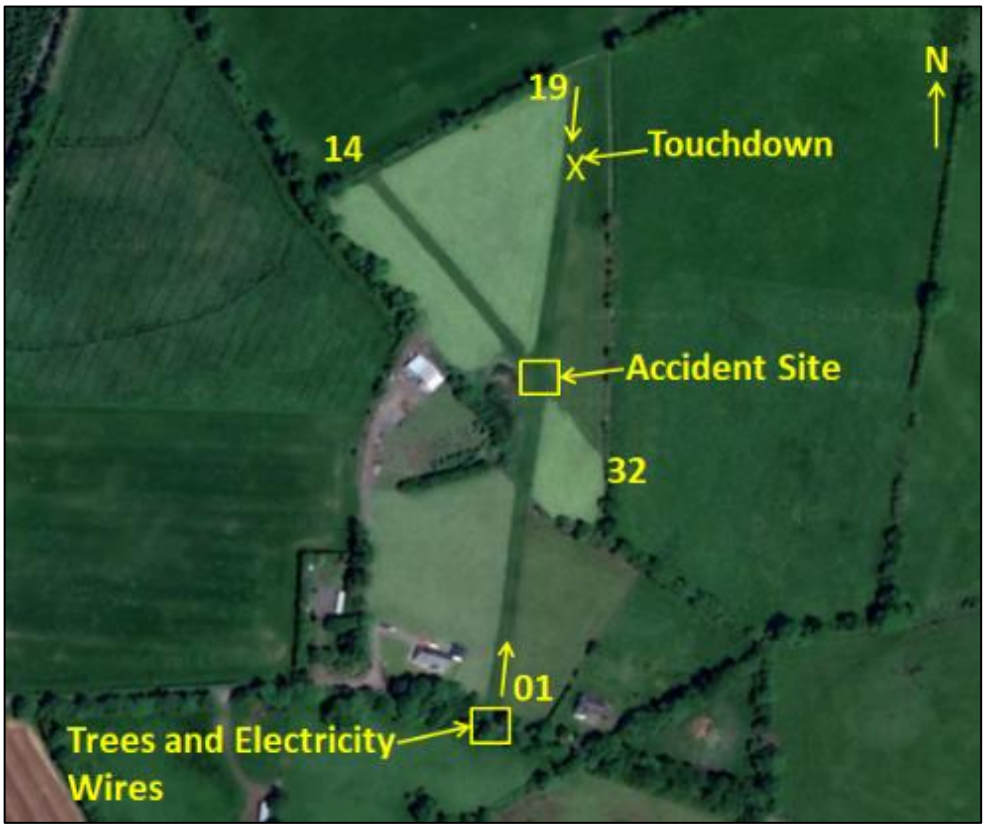

Figure No. 1: Aerial view of Snug Beag Airfield (*Google Earth*)

1.7 Tail-wheeled Aircraft

Tail-wheel configured aircraft are, by virtue of the undercarriage geometry, susceptible to nosing over during heavy braking. EI-AEM is fitted with landing gear extenders, which was a modification available to the aircraft type aimed at reducing, but not eliminating this tendency.

Chapter 13 of the FAA *'Airplane Flying Handbook'* (FAA-H-8083-3B) provides guidance to pilots regarding the handling of tail-wheeled aircraft '*because of the relative placement of the main gear and the CG [Centre of Gravity], tail-wheel aircraft are inherently unstable on the ground'.* It also notes that *'It is far better to respond to a bounced wheel landing attempt by initiating a go-around or converting to a three-point landing if conditions permit'.*

2. AAIU COMMENT

The aircraft was configured for a single-occupant short flight and was therefore quite light. Tail-wheel configured aircraft are, by virtue of the undercarriage geometry, susceptible to directional instability and also nosing over during heavy braking.

Once the aircraft experienced the bounced landing, the option of a go-around was discounted by the Pilot due to the trees and electricity wires obstructing the end of the runway. The Pilot applied full back elevator to keep the tail-wheel on the ground while maintaining directional control of the aircraft, and applied significant pressure to the brakes. This resulted in the aircraft overturning about its lateral axis and coming to rest inverted on the grass runway pointing back in the direction of flight.

At the point at which the aircraft overturned, the Pilot had approximately 175 m of runway remaining. On a grass runway with the tail-wheel on the ground and directional control maintained, minimal braking should have been sufficient to allow the aircraft to slow to taxi speed.

Whilst a go-around is the recommended course of action following a bounced landing in a tail-wheeled aircraft, the Pilot considered he did not have that option due to the obstacles at the end of the runway. The Investigation, while not discounting the height of the obstacles, notes that at the point of the bounced landing, the Pilot had 300 m of runway remaining, which should have been sufficient to perform a go-around notwithstanding the height of the obstacles at the end of the runway.

As a go-around could be required for a number of reasons, the Investigation notes that it would not be considered best practice to attempt to land on a runway where it is considered that there is *"not an option"* to perform a go-around.

- 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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