Air Accident Investigation Unit Ireland

FACTUAL REPORT

ACCIDENT

ICP Srl Savannah S, EI-GUZ
Clonbullogue Airfield, Co. Offaly

14 August 2022

An Roinn Iompair
Department of Transport

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.

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[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: 2023-004

State File No: IRL00922033

Report Format: Factual Report

Published: 28 March 2023

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 14 August 2022, appointed Clive Byrne as the Investigator-in-Charge to carry out an Investigation into this Accident and prepare a Report.

Aircraft Type and Registration:	**ICP Srl, Savannah S, EI-GUZ**
No. and Type of Engines:	**1 x BRP-Rotax 912 ULS**
Aircraft Serial Number:	**20-11-54-0744**
Year of Manufacture:	**2020**
Date and Time (UTC)[4]:	**14 August 2022 @ 12:37 hrs**
Location:	**Clonbullogue Airfield (EICL), Co. Offaly, Ireland**
Type of Operation:	**General Aviation**
Persons on Board:	**Crew – 2 Passengers – Nil**
Injuries:	**Crew – Nil**
Nature of Damage:	**Substantial**
Commander's Licence:	**Airline Transport Pilot Licence (ATPL) Aeroplane (A) issued by the Irish Aviation Authority (IAA)**
Commander's Age:	**43 years**
Commander's Flying Experience:	**10,695 hours, of which 22 were on type**
Notification Source:	**Aircraft Operator**
Information Source:	**AAIU Report Form submitted by the Pilot, AAIU Field Investigation**

[4] **UTC**: Co-ordinated Universal Time. All times in this report are quoted in UTC unless otherwise stated; local time was UTC + 1 hour on the date of the accident.

SYNOPSIS

During a Private Pilot Licence skill test at Clonbullogue Airfield (EICL), Co. Offaly, the Savannah S aircraft, with a Student Pilot and a Flight Examiner on board, were conducting a simulated glide approach with the intention of a full-stop landing. During the landing, the aircraft bounced a number of times. The Examiner took control and initiated a go-around during which the aircraft briefly became airborne before the go-around was rejected. The aircraft landed and came to rest in a nose-down attitude at the side of the runway. The occupants, neither of whom was injured, exited the aircraft unaided. There was no fire.

NOTIFICATION

The aircraft Operator notified the AAIU of the accident.

1. FACTUAL INFORMATION

1.1 History of the Flight/Occurrence

Earlier in the day, in preparation for his upcoming skill test (examination flight) for a Private Pilot's Licence (PPL), the Student Pilot completed a local flight in the subject aircraft with a flight instructor. No issues were noted.

Prior to the skill test, the Flight Examiner completed a ground briefing with the Student Pilot (hereafter referred to as the Candidate) during which, emergencies and go-arounds were discussed.

During the skill test, the Candidate had completed two landings at EICL and was conducting a simulated glide approach from the downwind leg to a full-stop landing on Runway (RWY) 27. During the base leg, the Candidate considered that he was a '*little high*' and opted to fly through the extended centreline slightly in order to reduce the aircraft's altitude further and acquire the required descent profile. The aircraft was then turned to the south-west to align with the runway centreline. The aircraft established a wings level attitude on the RWY 27 centreline as it passed over the boundary marking cones at the start of the runway.

The aircraft initially touched down on all three wheels and bounced a number of times. The magnitude of each bounce became progressively larger, as did the associated pitch oscillation. Successive bounces resulted in increased nose-down attitudes on each contact with the runway. On the third bounce, approximately 90 m from the initial touchdown, the nose wheel impacted the runway forcefully.

At this point, the Flight Examiner decided to take control for a go-around and applied full throttle as had been discussed during the pre-flight briefing. As the go-around was being attempted, the aircraft became airborne briefly; however, on noticing that the application of full throttle was not providing the expected power response, and that a high level of vibration was now evident within the aircraft, the Flight Examiner set the throttle to idle and landed again. The aircraft came to a stop approximately 400 m from the initial touchdown point, in a nose-down attitude.

Video footage reviewed by the Investigation shows that from initial touchdown on the runway, the aircraft bounced three times over approximately 90 metres (m) prior to the nose landing gear collapsing.

Both occupants unbuckled from their respective four-point safety harness, which were reported to have operated satisfactorily, and exited the aircraft unaided. The airfield rescue services reacted promptly and travelled the short distance along the runway in order to assist. There was no fire.

1.2 Injuries to Persons

No injuries arising from the accident were reported to the Investigation.

1.3 Aircraft Information

The Savannah S is a single engine, all-metal, high-wing, two-seat aircraft with a fixed tricycle landing gear and with a four-point harness fitted to each seat. The subject aircraft, EI-GUZ, was homebuilt in Ireland in 2020. The most recent Flight Permit for the aircraft was issued by the IAA on 22 January 2022 and was valid until 21 January 2023.

On 10 August 2022, at 773 aircraft hours total time, a maintenance check comprising a '*25-hour 3-month inspection'* was recorded in the airframe logbook, with no anomalies noted. The airframe and engine had accrued a total time in service of 785 hours prior to the accident flight. The maximum take-off weight of the aircraft, as stated on the Flight Permit, was 600 kg.

During interview after the accident, both the Flight Examiner and the Candidate were satisfied that the aircraft was serviceable prior to and during the flight.

1.4 Damage to Aircraft

The nose landing gear had collapsed rearwards and all three propeller blades sustained significant damage. The collapsed nose landing gear caused some minor buckling of the lower fuselage panel and attachment fixtures below the cockpit area (**Photo No. 1**).

Photo No. 1: Damage sustained by EI-GUZ

1.5 Other Damage

There was no other damage reported or observed.

1.6 Meteorological Information

Both the Flight Examiner and the Candidate reported that weather conditions were good on the day of the accident and that the wind was light. *Met Éireann*, the Irish meteorological service, was asked to provide the Investigation with an aftercast for the weather conditions prevailing in the Clonbullogue area at the time of the accident. The details are presented in **Table No. 1**.

Meteorological Situation:	Ireland lies in a light to moderate north-easterly or variable airflow, between an anticyclone centred near Norway and an area of low pressure close to Brittany.
Surface Wind: **Wind at 2,000 ft:**	North-west, 3-6 knots (kt). North-west, 5 kt.
Visibility:	30 kilometres (km).
Weather:	Hazy sunshine and cloudy patches.
Cloud:	Few (1-2/8th oktas[5]) fair weather cumulus clouds with bases between 3,000 and 4,000 ft, and a broken (5-7/8th oktas) layer of stratocumulus cloud with bases between 6,000 and 7,000 ft.
Surface Temperature/Dew Point:	26/15 degrees Celsius.
Mean Sea Level (MSL) Pressure:	1006 hectopascals (hPa).
Freezing Level:	10,000 ft.

Table No. 1: Aftercast of weather conditions in the Clonbullogue area at time of occurrence

1.7 Airfield Information

Clonbullogue Airfield (EICL) is situated in Co. Offaly. The airfield has one grass runway which is designated RWY 09/27. The runway is 770 m in length and 18 m in width (**Figure No. 1**).

[5] **Oktas:** Unit of cloud amount, expressed as the number of eighths of the sky dome that are covered by clouds.

Figure No. 1: Aerial view of EICL (*Google Earth*)

1.8 Personnel Information

The Candidate was undergoing a skill test (examination flight) with an IAA-certified Flight Examiner for the issuance of an EASA[6] Private Pilot's Licence (PPL) (A).

1.8.1 Pilot in Command / Flight Examiner

The Flight Examiner held an ATPL (A) licence issued by the IAA on 12 March 2012 and at the time of the accident had 10,695 hours flying experience, of which 22 hours were on the accident type. The Flight Examiner's licence contained a number of class ratings and certificates, including a SEP[7] (land), a FI[8] (A) – SEP (land) Instructor and a FE[9] (A) – SEP (land) all of which were valid. The Flight Examiner's Medical Certificate was issued by an IAA-approved Aeromedical Examiner (AME) on 18 Oct 2021 and was valid until 30 Oct 2022.

1.8.2 Skill Test Candidate

Although not required for the skill test, the Candidate held a SPL[10] (A) licence issued by the IAA on 8 March 2021. At the time of the accident the Candidate had 122 hours flying experience, all of which were on the accident type. The Candidate's Medical Certificate was issued by an IAA-approved AME on 22 September 2020 and was valid until 22 September 2022.

1.9 Personnel Licensing

In order to be issued with an EU PPL, a person must undergo a course of flight training at a pilot training organisation that is approved or has declared as a training organisation in the EU. Upon successful completion of a course and passing the required examinations and skill test at either an Approved Training Organisation (ATO) or a Declared Training Organisation (DTO), a PPL will be issued by the relevant competent authority, subject to the applicant holding an appropriate medical certificate.

[6] **EASA:** European Union Aviation Safety Agency.
[7] **SEP:** Single Engine Piston.
[8] **FI:** Flight Instructor.
[9] **FE:** Flight Examiner.
[10] **SPL:** Student Pilot Licence.

The Candidate had completed a syllabus of flight training with an IAA-registered DTO. The objective of the training, and the associated examinations and skill test, was to obtain an EASA Part-FCL[11] PPL (A) with a Single-engine Piston (Land) class rating. In preparation for the skill test, a '*mock*' skill test was conducted on 6 August 2022. In addition, the Candidate had completed a pre-test flight with an instructor two hours prior to the accident.

1.10 Bounced Landing

When an aircraft approaches to land at an incorrect attitude, high airspeed at touch-down or with a high sink rate at touchdown, the aircraft will tend to rebound or bounce back into the air. The corrective action for a bounce during landing is dependent on the severity of the bounce. A shallow bounce where there is no extreme change in pitch attitude can be corrected by applying the appropriate power (for the aircraft type) and adjustment of the aircraft's pitch attitude thereby cushioning the subsequent touchdown. In its discussion of Approaches and Landings, the Federal Aviation Administration's '*Airplane Flying Handbook*'[12], notes that where a bounce is severe, the safest procedure is to '*… execute a go-around immediately. The Pilot should not attempt to salvage the landing'*. Often in these situations, the greatest difficulty for a pilot will be in the taking of a quick and positive decision to go around.

An attempt to recover the landing will increase the landing distance required and if a pilot relaxes the back pressure on the controls in an attempt to land there is a risk that the aircraft will touchdown on the nose wheel, possibly causing another bounce and damage to the aircraft.

According to the Airplane Flying Handbook, during a bounced landing that is improperly recovered, a condition known as '*Porpoising'*[13] may occur where the aircraft comes in nose-first, setting off a series of motions similar to the motion of a porpoise. Where porpoising becomes severe, the safest procedure is to '*… execute a go-around immediately'.*

2. AAIU COMMENT

The skill test proceeded normally until the latter stages of the final approach to RWY 27 at EICL for a full-stop landing. As the Candidate was completing a simulated glide approach to the airfield, he extended the base leg in order to reduce the aircraft's altitude prior to establishing on final approach. This type of manoeuvre has the potential to result in an unstable approach, the recommended response to which is a go-around.

In general terms, once an aircraft is on final approach, low level manoeuvring should be avoided as this can lead to excessive airspeeds, inappropriate rates of descent, excessive bank angles, and subsequent difficulties in controlling an aircraft during the landing sequence.

[11] **FCL:** Flight Crew Licence
[12] **FAA Airplane Flying Handbook**: FAA-H-8083-3C, 2021, Chapter 9.
[13] **Porpoising:** Oscillating around the lateral axis of the aircraft during landing.

On the accident flight, the aircraft established a wings level attitude on the RWY 27 centreline as it passed over the boundary marking cones at the start of the runway. Following initial touchdown, the aircraft bounced, and the Candidate attempted to recover the landing; however, the magnitude of each bounce became progressively larger, as did the associated pitch oscillation. The aircraft transitioned into a condition known as porpoising, which continued until the nose landing gear collapsed and the propeller impacted the ground. On the third bounce after initial touchdown, the Flight Examiner, took control and applied full throttle to go-around.

Although the aircraft became airborne momentarily with the application of full throttle, the power response from the engine was not as expected and a high level of vibration was experienced. The vibration felt was likely due to the damage sustained to the propeller during the nose landing gear collapse. The go-around was rejected by the Flight Examiner and the engine throttle was set to idle. The aircraft landed and came to rest in a nose-down attitude approximately 400 m from the initial touchdown point.

Bounced landings may occur as a result of an unstable approach leading to a hard landing due to, for example, excessive airspeed, improper attitude or an excessive sink rate. Pneumatic tyres and shock absorbing landing gear are designed to dissipate some of the aircraft energy at touchdown to assist in preventing a bounce from occurring. A shallow bounce can be corrected by applying the appropriate power (for the aircraft type) and adjustment of the aircraft's pitch attitude thereby cushioning the subsequent touchdown. However, when a landing is hard and the aircraft energy is high, there is a risk of a severe bounce, and the safest procedure is to execute a go-around immediately to avoid the risk of porpoising.

- 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.

Produced by the Air Accident Investigation Unit

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

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