SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Section/division **Accident and Incident Investigations Division** Form Number: CA 12-57

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10398								
Classification	Accident			**Date**	9 December 2023			**Time**	0600Z
Type of Operation	Training (Part 141)								
Location									
Place of Departure	Wonderboom Aerodrome (FAWB), Gauteng Province			Place of Intended Landing				Wonderboom Aerodrome (FAWB), Gauteng Province	
Place of Occurrence	Runway 06 at Wonderboom Aerodrome (FAWB)								
GPS Co-ordinates	Latitude	25°39'19.11" S		Longitude	028°13'16.81" E		Elevation	4 095 feet (ft)	
Aircraft Information									
Registration	ZS-SDA								
Make; Model; S/N	Cessna Aircraft Company; C172P Skyhawk (Serial Number: 17276251)								
Damage to Aircraft	Substantial				Total Aircraft Hours		15 250.9		
Pilot-in-command									
Licence Type	Student Pilot Licence (SPL)			Gender	Female		Age	20	
Licence Valid	Yes		Total Hours	37		Total Hours on Type		37	
Total Hours 30 Days	3.7			Total Flying on Type Past 90 Days			10.8		
People On-board	1+0	**Injuries**	0	**Fatalities**	0		**Other (on ground)**	0	

What Happened

On Saturday morning, 9 December 2023, a student pilot (SP) on-board a Cessna 172P Skyhawk aircraft with registration ZS-SDA took off on a solo consolidation flight from Wonderboom Aerodrome (FAWB) with the intention to conduct touch-and-go-landing exercises and, thereafter, land at the same aerodrome. The flight was conducted in visual meteorological conditions (VMC) by day and under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011 as amended.

The SP stated that she initially conducted three uneventful touch-and-go landing exercises with the flight instructor. The flight instructor was satisfied with her performance, and thereafter, disembarked from the aircraft and she continued with the touch-and-go landing exercises. Whilst flying solo, she had difficulty with audio connectivity, and the headset microphone kept dropping away from her mouth. The SP stated that she had to use her hand to align the headset microphone to her mouth whilst communicating with the air traffic control (ATC) officer. To resolve the audio problem, the SP fiddled with the radio and change the audio jack. However, these inputs were unsuccessful (*the SP was on the extended downwind leg during this time*). The SP transmitted a call to the ATC and reported final approach for Runway 29, but there was no response from the ATC officer.

Meanwhile, the SP overheard a transmission from the ATC officer requesting the pilot from the aircraft that was following the SP to confirm if the SP was on final approach as her radio transmission was faint. After flying

over the threshold of Runway 29, the SP reduced power before initiating a round out. The aircraft ballooned and touched down hard on its main wheels and bounced. It touched down for the second time and bounced (this time the touchdown was harder and the bounce was higher than the previous one). The SP applied power to initiate a go-around and the aircraft's nose pitched up. *The aircraft's indicated air speed (IAS) was approaching the stalling speed at this time*. The aircraft touched down for the third time, this time with the nose gear first. The nose gear broke and the propeller impacted the runway. The aircraft skidded on its nose and veered off to the left of the runway. It came to a stop a few metres from the edge of the runway. The SP turned off all the electrical switches and exited the aircraft unassisted. The Airport Firefighting and Rescue Service (ARFFS) responded to the accident scene. The aircraft sustained substantial damage to the propeller, nose gear and nose section. No person was injured during the accident.

In an interview with the SP, it was found that the SP had conducted Exercises 12 and 13 (emergency exercises which include forced landings, aborted take-offs, etc) approximately two weeks prior to the accident flight on 23 November 2023. The length between training was due to unfavourable weather conditions, unavailability of the aircraft because of the high influx of student pilots during that time, and the unavailability of the flight instructor, among other reasons. According to the SP's logbook, at the time when she was advanced to solo flight, she had 34.8 total hours. The maximum allowable hours to fly solo is 30 hours as stipulated in Part 61.02.7 of the Civil Aviation Regulations (CAR) 2011, read together with the South African Civil Aviation Technical Standards (SACATS). It was also found that the SP's headset was defective.

Figure 1: The aircraft after it came to a stop. (Source: Operator)

Figure 2: The damaged nose gear. (Source: Operator)

Figure 3: The propeller strike marks on the runway. (Source: Operator)

Discontinuance of Flight Training Part 61.02.7

[TS 61.02.7 inserted by the Director on 6 August 2016 through SA-CATS 2/2016 w.e.f. 28 November 2016.]

1. ***Failure to be recommended for solo flight after 30 hours (Aeroplane) or 40 hours (Helicopter) of dual flight training***

(1) A student pilot who fails to be recommended for solo flight after completing 30 (A) hours or 40 (H) hours of dual flight training, shall undergo a flight assessment by the CFI of the ATO where he or she is receiving flight training.

(2) If the CFI cannot recommend solo flight for the student, then the following shall apply:

(a) The student pilot shall be informed in writing that a potential safety risk has been identified and that CAR 61.02.7 may be brought into effect. The student shall acknowledge receipt of the letter.

(b) A training program of up to 5 hours dual flight instruction shall be designed and implemented to address the knowledge, skills and attitude of the student pilot.

(c) Once the additional 5 hours of dual flight instruction are flown (35 (A) or 45 (H)), a recommendation must be made by the responsible flight instructor for solo flight. If a recommendation cannot be made then the student must be referred for assessment by a DFE appointed for this purpose by the Director.

Floating During Roundout (Source: Airplane Flying Handbook FAA-8083-3A)

If the airspeed on final approach is excessive, it will usually result in the airplane floating. [Figure 4] Before touchdown can be made, the airplane may be well past the desired landing point and the available runway may be insufficient. When diving an airplane on final approach to land at the proper point, there will be an appreciable increase in airspeed. The proper touchdown attitude cannot be established without producing an excessive angle of attack and lift. This will cause the airplane to gain altitude or balloon. Any time the airplane floats, judgment of speed, height, and rate of sink must be especially acute. The pilot must smoothly and gradually adjust the pitch attitude as the airplane decelerates to touchdown speed and starts to settle, so the proper landing attitude is attained at the moment of touchdown. The slightest error in judgment and timing will result in either ballooning or bouncing. The recovery from floating will depend on the amount of floating and the effect of any crosswind, as well as the amount of runway remaining. Since prolonged floating utilizes considerable runway length, it should be avoided especially on short runways or in strong crosswinds. If a landing cannot be made on the first third of the runway, or the airplane drifts sideways, the pilot should ***execute a go-around.***

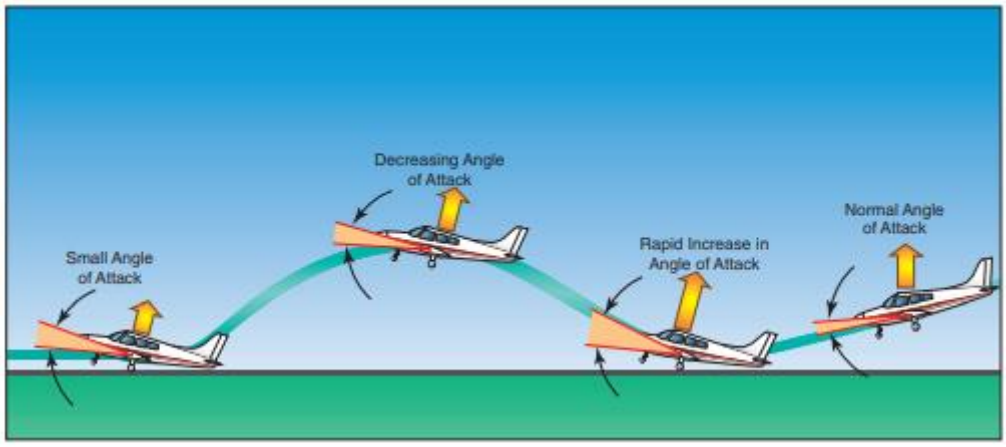

Illustration 1: An aircraft bounces during touchdown. (Source: Airplane Flying Handbook FAA-8083-3A)

Bulked Landing Procedure (Source: Pilot's Operating Handbook)

1. *Throttle – FULL OPEN*
2. *Carburettor Heat – COLD*
3. *Wing Flaps -- 20º*
4. *Climb Speed – 55 KIAS*
5. *Wing Flaps -- 10º (until obstacles are cleared). RETRACT (after reaching a safe altitude and 60 KIAS)*

Findings

Personnel Information

1. The SP was issued a Student Pilot Licence on 31 January 2023 with an expiry date of 30 January 2024. The SP was issued a Class 2 aviation medical certificate on 8 October 2022 with an expiry date of 8 October 2027 and with medical restrictions.

2. The training flight (which culminated into an accident) was not recorded in the logbook following the remedial flight. This was not in line with the provisions of Part 61.01.8 (3) of the CAR 2011 as amended.

3. The SP exceeded the recommended 30 hours of flight time before advancing to solo flight. As per the regulations set out in the SACATS Part 61.2.7, the chief flight instructor (CFI) wrote a letter in which the potential safety risk as well as the slow progress of the SP were identified as she exceeded the recommended 30 hours to fly solo. The SP was assigned to a senior flight instructor, and an additional 5-hour programme was recommended to the SP.

4. According to the SACATS Part 61.02.5, the flight instructor must endorse the student pilot's logbook before the student pilot is released for their initial solo flight. The logbook was endorsed on 2 December 2023 by the Grade II flight instructor.

Aircraft Information

5. The last mandatory periodic inspection (MPI) on the aircraft was conducted on 1 September 2023 at 15 102.2 airframe hours with an expiry date of 1 September 2024 or at 15 202.2 airframe hours, whichever comes first.

6. The aircraft maintenance organisation (AMO) which conducted the last MPI had the AMO certificate that was issued on 3 November 2022 with an expiry date 30 November 2023.

7. The Certificate of Airworthiness (C of A) was initially issued on 15 March 2018. The C of A was reissued on 18 April 2024 with an expiry date of 17 April 2024.

8. The aircraft was registered to the present owner on 9 June 2021.

9. According to the airframe logbook, the aircraft was involved in previous accidents in which the nose gear (section) was damaged. The accidents occurred on 24 October 2008 (CAA ref number 0681), 19 July 2022 (CAA ref 1403), and 16 January 2023 (CAA ref 10250). These accidents were investigated by the AIID and the reports are available on the SACAA website (Accidents and Incidents – SACAA). The AMO which conducted the structural repairs to the nose section after the accident of 16 January 2023 had an AMO certificate that was issued on 9 November 2022 with an expiry date of 30 November 2023. The AMO had a Category B rating to conduct structural repairs on this aircraft type.

10. The approved training organisation (ATO) was issued an ATO certificate on 22 January 2021 with an expiry date of 31 January 2026.

11. SACATS Part 61.2.7(1) states: "*A student pilot who fails to be recommended for solo flight after completing 30 (A) hours or 40 (H) hours of dual flight training, shall undergo a flight assessment by the CFI of the ATO where he or she is receiving flight training."* The CFI issued the SP with a letter of poor performance as required by SACATS Part 61.2.7. In addition, the CFI flew with the SP on 8 November 2023 and the SP was recommended to proceed to solo flights.

12. The provisions of SACATS Part 61 mandates the CFI to place the student pilot in a training programme of up to 5 hours of dual flight instruction which are designed and implemented to address the knowledge, skills and attitude of the student pilots. This requirement was executed by the ATO.

13. The communication difficulty that the SP encountered during the flight was due to the defective headset. There were no records found that the aircraft's radio had technical issues.

14. The approach speed was too high which caused the aircraft to float above the runway and touched down hard and deep, this was followed by two bounces. The SP attempted to execute a go-around, but the aircraft stalled and touched down with the nose gear which broke before the aircraft veered off to the left of the runway.

Probable Cause

The aircraft's airspeed was too high on approach for landing which caused it to float before it touched down hard, followed by two bounces. The aircraft stalled and, thereafter, touched down hard with the nose landing gear which broke; the aircraft veered off to the left of the runway.

Contributing Factors

Incorrect technique used during landing and recovery.

Safety Action(s)

Numerous student pilots with low hours at this ATO have been involved in landing incidents. The ATO's safety office identified the risk, and the safety manager initiated a meeting to identify ways to mitigate the risks associated with the landing incidents.

After this accident, the student pilot underwent a psychological assessment and, thereafter, the student pilot flew a remedial flight with a different instructor on 12 February 2024; the student pilot was found proficient to continue with the training.

The safety manager reiterated that a “remedial training be conducted by a senior Grade 2 instructor. As of From January 2024, all students are required to acquire their (Own) headsets. The training department incorporated more stringent checks for balloon recovery for solo students which forms part of the initial solo check. Also, incremental checks will apply until PPL graduation is accomplished. This also forms part of the check rides for Hire and Fly clients with PPL licenses. A special instructors meeting is planned during the course of 2024 to analyse the accident and incidents. The outcomes from this meeting will be shared with the ATO POI as a safety improvement strategy”.

Safety Message

In the interest of safety, ATO’s are advised to adhere to the Regulator requirements to allow safe operations, and to prevent injury and damage to property.

About this Report

The decision to conduct a limited investigation is based on factors including whether the cause is known and the evidence supporting the cause is clear, the level of safety benefit likely to be obtained from an investigation and that will determine the scope of an investigation. For this occurrence, a limited investigation has been conducted, and the Accident and Incident Investigations Division (AIID) has relied on the information submitted by the affected person/s and organisation/s to compile this limited report. The report has been compiled using information supplied in the initial notification, as well as from follow-up desk top enquiries to bring awareness of potential safety issues to the industry in respect of this occurrence, as well as possible safety action/s that the industry might want to consider in preventing a recurrence of a similar occurrence.

All times given in this report are Co-ordinated Universal Time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus 2 hours.

Purpose

In terms of Regulation 12.03.1 of the Civil Aviation Regulations (CAR) 2011 and ICAO Annex 13, this report was compiled in the interest of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and not to apportion blame or liability.

Disclaimer

This report is issued by:
Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa