COMANDO DA AERONÁUTICA

CENTRO DE INVESTIGAÇÃO E PREVENÇÃO DE ACIDENTES AERONÁUTICOS

FINAL REPORT
A-073/CENIPA/2022

OCCURRENCE:	**ACCIDENT**
AIRCRAFT:	**PP-GEJ**
MODEL:	**AB-115**
DATE:	**17JUN2022**

NOTICE

According to the Law nº 7565, dated 19 December 1986, the Aeronautical Accident Investigation and Prevention System – SIPAER – is responsible for the planning, guidance, coordination, and execution of the activities of investigation and prevention of aeronautical accidents.

The elaboration of this Final Report was conducted considering the contributing factors and hypotheses raised. The report is, therefore, a technical document which reflects the result obtained by SIPAER regarding the circumstances that contributed or may have contributed to triggering this occurrence.

The document does not focus on quantifying the degree of contribution of the distinct factors, including the individual, psychosocial or organizational variables that conditioned the human performance and interacted to create a scenario favorable to the accident.

The exclusive objective of this work is to recommend the study and the adoption of provisions of preventative nature, and the decision as to whether they should be applied belongs to the President, Director, Chief or the one corresponding to the highest level in the hierarchy of the organization to which they are being forwarded.

This Final Report has been made available to the ANAC and the DECEA so that the technical-scientific analyses of this investigation can be used as a source of data and information, aiming at identifying hazards and assessing risks, as set forth in the Brazilian Program for Civil Aviation Operational Safety (PSO-BR).

This Report does not resort to any proof production procedure for the determination of civil or criminal liability, and is in accordance with Appendix 2, Annex 13 to the 1944 Chicago Convention, which was incorporated in the Brazilian legal system by virtue of the Decree nº 21713, dated 27 August 1946.

Thus, it is worth highlighting the importance of protecting the persons who provide information regarding an aeronautical accident. The utilization of this report for punitive purposes maculates the principle of "non-self-incrimination" derived from the "right to remain silent" sheltered by the Federal Constitution.

Consequently, the use of this report for any purpose other than that of preventing future accidents, may induce to erroneous interpretations and conclusions.

N.B.: This English version of the report has been written and published by the CENIPA with the intention of making it easier to be read by English speaking people. Considering the nuances of a foreign language, no matter how accurate this translation may be, readers are advised that the original Portuguese version is the work of reference.

SYNOPSIS

This is the Final Report of the 17 June 2022 accident with the AB-115 aircraft, registration marks PP-GEJ. The occurrence received the typification of “[LOC-G] Loss of control on the ground and [RE] Runway excursion”.

On his first solo flight, the AL (Student Pilot) lost control of the aircraft during the landing run. As a result, the aircraft swerved to the left, touching the tip of the right wing on the runway and the propeller blades on the ground, exiting the runway via the left-hand side in an area of grass.

The aircraft sustained substantial damage.

The AL suffered no injuries.

For being Argentina the State of design of the aircraft, the Argentine *Junta de Seguridad en el Transporte* (JST) appointed an Accredited Representative for participation in the investigation of the accident.

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GLOSSARY OF TECHNICAL TERMS AND ABBREVIATIONS

AL	Student Pilot
ANAC	Brazil's National Civil Aviation Agency
CA	Certificate of Airworthiness
CVA	Airworthiness-Verification Certificate
CENIPA	Brazil's Aeronautical Accidents Investigation and Prevention Center
CIAC	Civil Aviation Instruction Center
CIV	Pilot Logbook
CMA	Aeronautical Medical Certificate
INVA	Flight Instructor Rating (Airplane)
MNTE	Single-Engine Land Airplane Class Rating
NSCA	Command of Aeronautics' System Norm
OM	Maintenance Organization
PCM	Commercial Pilot License (Airplane)
IN	Instructor Pilot
INMET	Brazil's National Institute of Meteorology
PPR	Private Pilot License (Airplane)
PPR P	Practice-Instruction Program of the Private Pilot Course - Airplane
PRI	Private Aircraft Registration Category (Instruction)
SACI	Integrated Civil Aviation Information System
SDFD	ICAO location designator - *Coronel Aviador Carlos Orleans Guimarães* Aerodrome, *Fernandópolis*, State of *São Paulo*
SIPAER	Brazil's Aeronautical Accidents Investigation and Prevention System
UTC	Universal Time Coordinated
VFR	Visual Flight Rules

1. FACTUAL INFORMATION.

Aircraft	**Model:** AB-115 **Registration:** PP-GEJ **Manufacturer:** Aero Boero.	**Operator:** *Aeroclube de Fernandópolis*.
Occurrence	**Date/time**: 17JUN2022 - (UTC) **Location:** SDFD (Aerodrome of *Fernandópolis*) **Lat.** 20°16'40"S **Long.** 050°13'01"W **Municipality – State:** *Fernandópolis* – State of *São Paulo*.	**Type(s):** [LOC-G] Loss of control - ground [RE] Runway excursion

1.1. History of the flight.

At about 12:10 UTC, the aircraft took off from SDFD (*Coronel Aviador Carlos Orleans Guimarães* Aerodrome, *Fernandópolis*, State of *São Paulo*) on a local instruction-flight, with two pilots on board.

After doing the planned exercises in the instruction area, the crew landed, and the IN (Instructor Pilot) deplaned so that the Student Pilot could perform a solo flight in the traffic pattern. During the landing upon completion of the solo flight, the student pilot lost control of the aircraft, which veered off the runway via the left-hand side.

The aircraft sustained substantial damage.

The AL received no injuries.

1.2. Injuries to persons.

Injuries	Crew	Passengers	Others
Fatal	-	-	-
Serious	-	-	-
Minor	-	-	-
None	1	-	-

1.3. Damage to the aircraft.

The aircraft sustained damage to its right-hand wing, landing gear assembly, propeller, and engine.

1.4. Other damage.

NIL.

1.5. Personnel information.

1.5.1. Crew's flight experience.

FLIGHT EXPERIENCE	
	AL
Total	20:30
Total in the last 30 days	17:30
Total in the last 24 hours	01:30
In this type of aircraft	20:30
In this type in the last 30 days	17:30
In this type in the last 24 hours	01:30

N.B.: data relating to hours flown were obtained from the records of the AL's digital Individual Flight Logbook (CIV), available in the Integrated Civil Aviation Information System (SACI) of the National Civil Aviation Agency (ANAC).

1.5.2. Personnel training.

The AL was doing the PPR course (Private Pilot - Airplane) at the *Aeroclube de Fernandópolis*, State of *São Paulo*.

The AL's first instruction flight took place on 11 May 2022, and the course continued with a certain regularity of flights until the date of the accident, which occurred on 17 June 2022. During this period, on only three occasions did the AL carry out two missions on the same day, one of which was on the date of the accident.

By the date of the accident flight, the AL had made 74 landings in the location, and, in its check mission for the obtainment of the solo flight status, he carried out the minimum (and mandatory) six landings prescribed in the instruction program.

In the PS-11 and PS-12 missions, the AL showed a tendency to make the aircraft touch down quickly on the runway:

> PS-11 - Student performed good landings and good maneuvers, just (should) be more patient when touching down.
>
> PS-12 - Student performing good maneuvers and good landings, should take it easy when putting the plane on the ground.

In the PS-15, PS-16 and PS-17 missions, he had difficulties during the landing flare:

> PS-15 - Student performing good ramps, only at the time of the landing flare, student bringing the plane too high and not being able to flare (emphasis added)
>
> PS-16 - Student performing good traffic circuits and good ramp judgment, good axis corrections, improving landings, just doing the landing flare a little high (emphasis added)
>
> PS-17 - Student doing the landing flare too high, causing the plane to touch crookedly and off the axis. (Emphasis added)

For these missions, the level of learning expected from the AL was defined in the PPR P as "*execution (X)*", and the student pilot had to:

> do the exercise alone. Minor errors are allowed, which must be interpreted and corrected by the very student with due promptness. INVA's intervention in the controls is not accepted as normal. (Emphasis added)

According to PPR P, the AL should have reached the "execution (X)" learning level when doing the exercises of "final approach" and "maintenance of the runway centerline after landing" in the PS-12 mission, as well as the "normal landing" in the subsequent PS-13 mission.

In the missions PS-18, PS-19 and PS-X1, the AL showed improvement in controlling the aircraft, managing to flare lower, making good landings, with safety and without intervention from the IN, who reported that he was "calm and undisturbed". At the end of the PS-X1 mission, the AL was released for the solo flight.

With respect to the after-landing techniques of the missions PS-04, PS-08, PS-09, and PS-14, the IN A reported that the AL applied pedal controls in an abrupt manner during the landing run in order to keep the alignment with the runway centerline. In those missions, the AL received grade 3, which meant that he had presented normal difficulties.

After the PS-14 mission, all instructions had the participation of another instructor (IN B), and the trend aforementioned was not reported any longer.

In the whole period before the accident, the AL had received neither a deficient nor an excellent grade (grade 2 and grade 5, respectively.

1.5.3. Category of licenses and validity of certificates.

The AL held a Student Pilot license and did not have any ratings.

1.5.4. Qualification and flight experience.

The AL's experience corresponded to the dual command flights of the PPR course, and his qualification was awarded by the IN based on the performance presented on the check flight.

1.5.5. Validity of medical certificate.

The AL held a valid CMA (Aeronautical Medical Certificate).

1.6. Aircraft information.

The serial number 224B aircraft was a product manufactured by Aero Boero in 1991 and registered in the Private Instruction Registration Category (PRI).

It was an Argentine-made training aircraft, with a conventional fixed gear, a semi-cantilever high wing with two wing struts, a mixed construction structure made up of welded steel tubes, aluminum alloy, canvas, fiberglass and accommodation for two crewmembers.

The landing gear was of the conventional type with a yoke wheel attached to the fuselage with the possibility of turning 360º. The distance between the wheels of the main landing gear was 1.76 m.

The Airworthiness Verification Certificate (CVA) of the aircraft was valid.

The records of the airframe, engine, and propeller logbooks were up to date.

The *Ícaro de Aviação Ltda*. Maintenance Organization (COM n º 6606-1/ANAC) located in *Mirassol*, State of *São Paulo*, performed the last aircraft inspection (type “100 hours” on 31 January 2022. The aircraft flew 54 hours and 55 minutes after the said inspection.

The last comprehensive inspection of the aircraft for the issuance of the CVA (Airworthiness Verification Certificate), took place on 10 November 2021, performed by an OM in *Penápolis*, State of *São Paulo*. The aircraft flew 405 hours after such inspection.

1.7. Meteorological information.

Through research of the database of the INMET (Brazil’s National Institute of Meteorology), with data collected by the meteorological station in *Votuporanga*, State of *São Paulo*, located 17 NM away from the location of the accident, it was observed that the wind had an intensity varying from 4 to 6 kt, between 13:00 and 14:00 (UTC).

The aerodrome was operating under visual conditions, with visibility above 10 km and, at the time of the occurrence, the aerodrome's visual wind condition indicator (windsock) showed calm wind information.

1.8. Aids to navigation.

NIL.

1.9. Communications.

Communications were established on a frequency free from traffic coordination, without any recordings or records allowing for subsequent analysis.

1.10. Aerodrome information.

The aerodrome was public, under the administration of the *Fernandópolis* City Council and operated Visual Flight Rules (VFR), during daytime.

The runway was asphalt, with thresholds 08/26, dimensions of 1,000 m x 25 m, at an elevation of 1,637 ft.

1.11. Flight recorders.

Neither required nor installed.

1.12. Wreckage and impact information.

An observer at the aerodrome recorded the accident on video.

The first touch on the runway occurred in a misaligned fashion, with the nose yawing to the left, close to the threshold of runway 08.

Shortly after touching down the pavement, the aircraft floated and touched the runway at least three more times to the right of the runway centerline before losing control. The plane then swerved quickly to the left, moving sideways and dragging the right-hand landing gear tire on the runway. The airplane immediately tilted to the right and hit the ground with the tip of the wing, until the right-hand wheel separated from the main gear.

Then, the right-hand gear ended up collapsing and, as a consequence, the left-hand one followed suit. The propeller blades struck the ground, and the aircraft exited the runway via the left-hand side.

After stopping, the aircraft stayed at an angle of 90° in relation to the runway axis.

The two main gear wheels separated from the aircraft. One of them stopped approximately 3 m ahead of the aircraft, and the other one at a distance of 30 m (Figure 1).

Figure 1 - Highlighted in the two red circles is the final position of the main gear wheels.
The yellow arrows show the marks left on the asphalt by the right-hand wing tip.

It was possible to observe that the marks of the right-hand tire of the aircraft's main gear were located approximately 5 m away from the right-hand edge of the runway (Fig. 2).

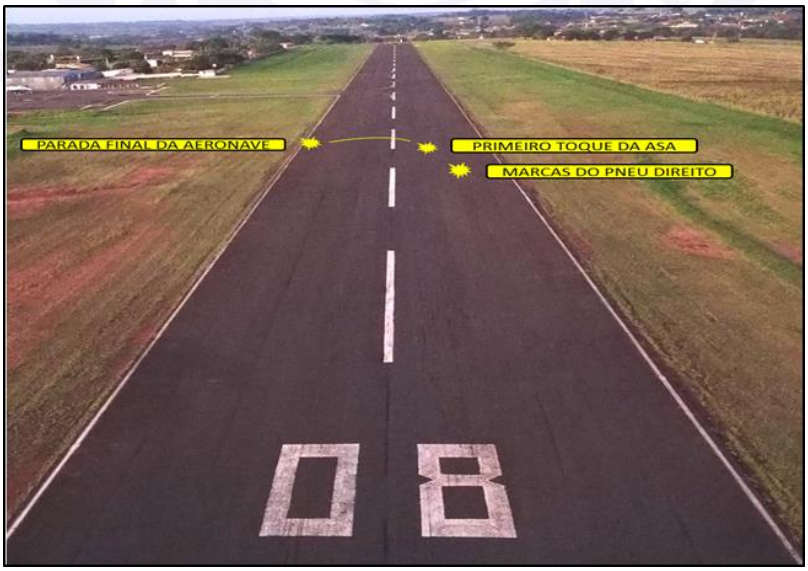

Figure 2 - Position of the rubber mark on the right main gear tire,
and first touch of the wing on the runway.

1.13. Medical and pathological information.

1.13.1. Medical aspects.

NIL.

1.13.2. Ergonomic information.

NIL.

1.13.3. Psychological aspects.

NIL.

1.14. Fire.

There was no fire.

1.15. Survival aspects.

NIL.

1.16. Tests and research.

NIL.

1.17. Organizational and management information.

The Practice Airplane Private Pilot Instruction Program (PPR P), of the *Aeroclube de Fernandópolis*' CIAC (Civil Aviation Instruction Center) required the AL to carry out at least 20 hours of flight before his solo flight. In this sense, the IN released the AL after his twentieth hour of flight, for considering him fit for the solo flight.

With respect to the solo flight, the CIAC had the following procedure for the AL: he/she would do the initial part of the flight with the IN on board, and complete all the prescribed exercises and, after that, he would perform the landing. Then, the IN would disembark in the parking area, and the AL would take off anew, this time without the IN on board, to join the traffic pattern and later make the full stop landing. Such dynamic was not a standard of the instruction program; there was only information on the exercises planned for the PS-20 mission.

During his training phase, the AL received instruction from just two instructors. He had, performed nine flights with one instructor, and eleven flights with the other.

Relatively to the instructors, it was possible to observe that one of them (herein defined as IN B) evaluated all the exercises of all the AL's instructions with a grade 4 (*good flight*), which, according to the CIAC's instruction program, meant the following:

> Good flight - The student demonstrates ease and perfection in executing most of the mission's exercises.

The IN B delivered the last seven instruction missions to the AL, one of which was the check flight for releasing him for the solo flight.

The other instructor (aka *IN A*) reported the AL's errors more frequently, and evaluated the AL's instruction items with a grade 3, which, according to the flying school's instruction program, meant the following:

> Satisfactory flight - The student presents normal difficulties.

The final grades of the AL's missions were logged as shown in Table 1.

	PS-01	PS-02	PS-03	PS-04	PS-05	PS-06	PS-07	PS-08	PS-09	PS-10	PS-11	PS-12	PS-13	PS-14	PS-15	PS-16	PS-17	PS-18	PS-19	PS-X1	PS-20
Instrutor A	4	4		3	3			3	3	3			3	3							
Instrutor B			4			4	4				4	4			4	4	4	4	4	4	1

Table 1 - Final grade of missions and their respective instructors.

In all the AL's missions, the course coordinator just signed the flight records, but did write any recommendations, guidance or opinions with reference to the AL's progress in the instructions.

1.18. Operational information.

On the accident flight, the aircraft was within the weight and balance limits specified by the manufacturer.

It was the AL's first solo flight, and aimed at flying the traffic pattern and making a landing.

The crewmember took off and completed the traffic circuit for landing without any problems.

During the final approach to land on the runway 08, one observed, by means of images recorded by an observer, that the ramp flown by the aircraft was low.

It was possible to observe that, throughout the final leg, the aircraft was misaligned with the approach axis, and the AL lowered the left-hand wing several times for correction of the misalignment. The aircraft performed such correcting maneuver in the segment from the long final up to the short final (Figure 3).

Figure 3 - In detail, the aircraft corrections to maintain alignment with the runway axis.

The aircraft kept the left wing "low" throughout the final approach.

Close to the vertical of the threshold, the AL performed the flare, and allowed the aircraft to float. He then touched the ground with the tailwheel, just after the runway's threshold markings, and rose again. There was also a second touchdown with the tail-wheel on the runway, followed by another subsequent rise (Figure 4).

Figure 4 - Approach, flare, and floating over the runway.

The images revealed that the AL tried to correct the alignment by applying the left-hand pedal, since he was in a position to the right of the runway centerline. Through analysis of a video of the occurrence, one observed that the directional rudder appears and disappears several times while the airplane touched the runway, showing that the AL attempted to correct the positioning of the aircraft with direct inputs on the pedals, as shown in the frames of Figure 5.

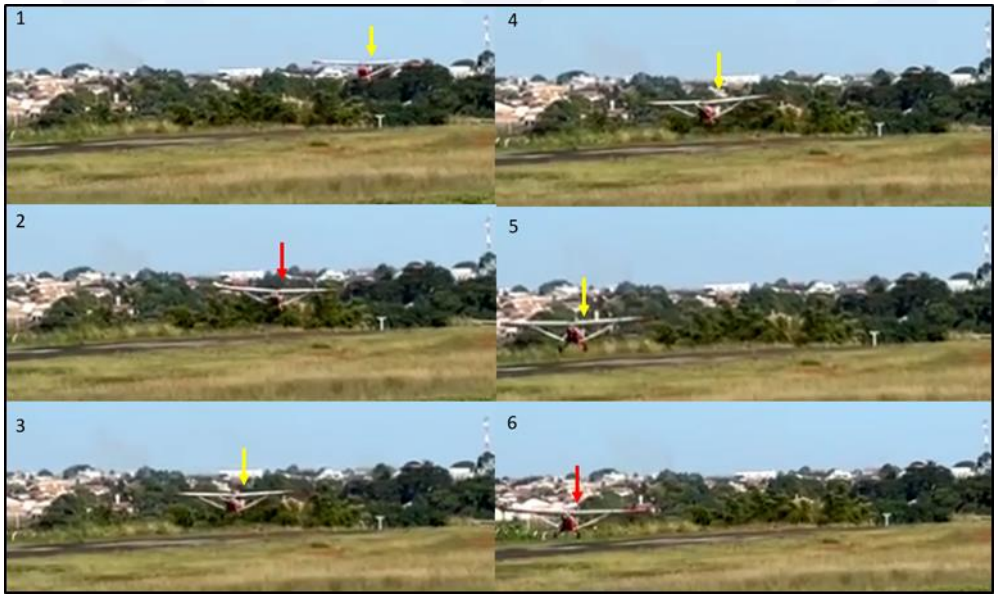

Figure 5 - Applying the left-hand pedal. The yellow arrows indicate the visible directional rudder and, in red, the hidden/semi-hidden directional rudder behind the fuselage.

After the second touch of the tailwheel on the ground, it is possible to observe sequentially the tailwheel touching the ground again, followed first by the right main gear and then by the left main gear. After such sequence of touches on the pavement, the aircraft rose anew, this time in a smoother fashion, but with a tight turn to the left.

At this moment, the tail of the aircraft quickly turns 90° to the left. Immediately thereafter, the tip of the right wing touches the asphalt, the main landing gear breaks, and the propeller blades touch the ground until the aircraft comes to a complete stop, in a position between the runway and the grassy area on the left-hand side of the runway.

Figure 6 – Tail-turn performed at the final landing.

1.19. Additional information.

NIL.

1.20. Useful or effective investigation techniques.

NIL.

2. ANALYSIS.

It was an instruction flight, divided into two parts, in which the AL carried out the first part of the flight with the IN on board. After the landing of the aircraft and deplaning of the IN, the AL took off again to perform his first solo flight, which consisted of a takeoff to join the local traffic circuit, and later proceed to the final landing.

In preparation of this mission, the AL had undergone an instruction program consisting of twenty tandem flights, before his release for the solo flight, in accordance with the prescriptions of CIAC's instruction program of the *Aeroclube de Fernandópolis*.

During the instruction process, one observed that the Instruction Center allocated two instructors to fly with the AL. One of them (IN B) featured a central tendency in his evaluations, assigning grade 4 (i.e. "good performance" in accordance with the school criteria) for all the items of the missions that he had flown with the AL.

This central tendency of evaluation undermined the reliability of the grades assigned in the instruction sheets, since, despite making comments that could be associated with an unsatisfactory performance, the IN would bestow grade 4 to the AL's performance.

In three consecutive missions, this IN reported that the AL had presented difficulties during the execution of the flare maneuver for landing.

According to comments logged In the PS-15, the AL did not manage to perform the flare maneuver, despite having received a grade 4 in that aspect. It is worth noting that in this mission, the level of learning expected from the AL would allow only minor errors, which

were to be corrected by the very AL. Therefore, there is an incompatibility between the grade bestowed in the evaluation sheet and the actual performance of the AL in the mission, considering that, according to the IN's comments, he was not able to perform the flare maneuver.

In the following mission, there was another comment stating that the AL was still performing slightly high flares, and, in the subsequent one, there was a comment that the flare had been “too high”. Even with such assessments on his flight records in these consecutive missions, the AL continued to receive grade 4 for his landing performance. It should be noted that these missions were seen as advanced in the course, as per the CIAC, and required a level at which the AL should be able to carry out the exercises alone, with only petty errors being allowed.

The “flare too high” comment concerning the flare maneuver denotes an error that would not be compatible with good flight performance (grade 4) in the advanced piloting course missions in which the errors appeared.

One also observed that the IN A participated mostly in the initial missions of the course with the AL involved in the accident, having reported, on several occasions, that the AL had difficulty maintaining the runway centerline after landing, and would apply the pedal controls in an abrupt fashion. Thus, the AL received grade 3 in the item “keep the runway centerline after landing” in four missions flown with the IN A.

The reports of abrupt application of the controls were made on non-consecutive flights only by the IN A until the PS-14 mission, and the other missions were flown with the IN B (who had a central assessment tendency). Therefore, it was not possible to identify whether the AL continued making such errors of abrupt application of controls during the landing run after the touchdown, something that contributed to hampering of the CIAC's decision-making process.

In this sense, relatively to the evaluation contained in the flight sheets, there were not any deficient grades bestowed to the AL’s flights, despite the recurrent errors observed in different phases of the flight, as well as the repetition of similar errors in consecutive missions of the advanced phase of the course. Moreover, the AL did not manage to execute the flare maneuver in one of the missions.

Such errors represented deficient flight performance in the instruction program, but were not regarded as such in the evaluation sheets, enabling one to notice a possible lack of efficiency in the standardization of CIAC's performance assessment.

One observes that the last seven flight-training missions of the AL had the participation of the same instructor (IN B), also responsible for the AL’s check flight. A good practice would be to carry out the check flight with another IN, in order to prevent any assessment-trend errors.

Additionally, throughout the piloting course, the CIAC coordinator just signed the flight records, not including any additional observations, guidance, or comments in relation to the instruction flights done by the AL.

Thus, on various occasions, the AL's difficulties could have been subject to correction by the CIAC, both during the practice flight instructions and upon reading the flight records signed by the coordinator.

Furthermore, one observes that, in the CIAC instruction program, there was no written guidance on how to conduct the flight dynamics of the PS-20.

As for the AL's piloting during the check flight, the IN B reported that he was making good landings, showing improvement in the control of the aircraft, managing to flare lower, making good landings with safety and without intervention from the IN. The instructor also reported that the AL was “calm and undisturbed” for the solo flight.

From a video recorded by an observer close to the accident site, it was possible to observe that, throughout the final leg, the AL approached the runway with the aircraft displaced to the right of the runway axis. This fact was confirmed by the frequent corrections made by the AL, lowering the left-hand wing of the aircraft, aiming to move it to the left. Even with calm winds, such maneuver was performed in the segment from the long final to the short final.

After crossing the runway threshold, the AL started correcting his lateral deviation by means of the left-hand pedal, and it was possible to observe, in the images, constant pedal applications with each floatation of the airplane, until control of the aircraft was lost.

Corroborating with this fact, the marks left by the tire of the right main gear on the pavement were approximately 5 m from right-hand edge of the runway.

If one considers that the runway was 25 m wide, and that the distance between the wheels of the main gear was 1.76 m, a centralized landing would allow the tires to touch the runway at an approximate distance of 11.62 m from its lateral edges.

In relation to this aspect, the IN B, in the assessment of the PS-17 mission, reported that the AL was touching the runway in a crooked and off-axis fashion. Nonetheless, the grade granted to the AL's performance was "good flight", with a grade 4 in the evaluation sheet.

Besides, the IN A, who had reported that the AL made abrupt control applications during the landing run, flew with the student pilot until the PS-14 mission. This piloting characteristic was no longer present in the records of the subsequent missions flown with the IN B.

Due to the recurrent applications of the left-hand pedal during landing, the touch on the ground off the center of the runway, the various floating episodes of the aircraft after passing the runway threshold, and the touches on the pavement with the landing gear not aligned with the runway centerline, the aircraft's tail suddenly rotated. From that moment on, it was no longer possible to control the aircraft, a condition that resulted in runway excursion via the left-hand side, and the aircraft propeller colliding with the ground.

Finally, it was possible to observe that the errors committed by the AL in his solo flight had already been repeatedly reported in several missions in the instruction phase. However, they were not appropriately graded, being, on several occasions, classified either as good or satisfactory flight. At no time did the AL receive a deficient grade or even a comment on his evaluation sheet made by the CIAC coordinator to guide and lead him to practice more often the exercises with which he had more difficulties.

3. CONCLUSIONS.

3.1. Findings.

a) the AL held a valid CMA (Aeronautical Medical Certificate);

b) the AL was doing a PPR Private course (Pilot - Airplane);

c) the aircraft had a valid CVA (Airworthiness-Verification Certificate);

d) the aircraft was within its weight and balance limits;

e) the airframe, engine, and propeller logbooks were up to date;

f) the meteorological conditions were suitable for the flight;

g) the evaluation of the instructions were conducted in an inappropriate manner relatively to the recommendations of the school's instruction program;

h) the CIAC coordination did not identify the AL's difficulties during the course;

i) the AL did not receive any deficient grades regarding his flights during the course;

j) in his solo flight, the AL flew the final leg at a low ramp;

k) the aircraft floated several times during the landing work;

l) during the landing, the AL applied the left-hand pedal several times to correct his misalignment in relation to the runway centerline;

m) tire marks from the right main gear were found in the center of the right side of the runway;

n) the touches of aircraft on the pavement were not aligned with the runway axis;

o) the aircraft veered off the runway via the left-hand side, coming to a stop in a position that formed an angle of approximately 90º with the runway axis;

p) the aircraft sustained substantial damage; and

q) the AL received no injuries.

3.2. Contributing factors.

- **Training – a contributor.**

The lack of monitoring of the AL's performance throughout the training process prevented the accurate identification of his difficulties, handicapping the improvement of the skills and attitudes necessary for the safe conduction of solo flights.

- **Handling of aircraft flight controls – a contributor.**

Ever since the airplane was on the long final, it was possible to observe that it was approaching the runway in a misaligned fashion, which culminated in a landing to the right of the runway centerline. One also noted that the landing work demanded several left-hand pedal corrections, with touchdown episodes that were misaligned with the runway axis. Additionally, the aircraft floated several times over the runway, evidencing that the application of the controls was not effective in achieving a safe condition for landing.

- **Instruction – a contributor.**

The fact that during the landing of the accident flight the AL repeated errors that had already been committed on previous flights, demonstrated that his training process did not provide him with the full knowledge and other technical conditions necessary for the successful performance of the activity.

- **Management planning – undetermined.**

The release of the AL for the solo flight by the same instructor responsible for the last seven instruction missions revealed inadequacy of the planning developed by the flying school at the management level, especially in relation to the allocation of human resources for the execution of the practice training. Such state of affairs may have contributed to expose the AL to endure the challenges of a solo flight at a time when he had not yet mastered the full range of necessary skills.

- **Insufficient pilot's experience – a contributor.**

The AL had 20 hours and 30 minutes of flight time, and such little experience contributed to his poor performance during a normal condition of the aircraft operation.

- **Managerial oversight – a contributor.**

The assessment of the AL's performance was inappropriate, in the sense that one failed to observe the repeated errors he had been making, and which would deserve the bestowal of deficient grades in accordance with the instruction program.

After the signature of the instruction-flight sheets by the CIAC coordinator, one verified that there were no remarks added to the flight records with comments on the progress achieved by the AL in the instruction, nor any observations regarding the inappropriate assignment of grades by the instructor.

4. SAFETY RECOMMENDATIONS

A proposal of an accident investigation authority based on information derived from an investigation, made with the intention of preventing accidents or incidents and which in no case has the purpose of creating a presumption of blame or liability for an accident or incident.

In consonance with the Law n°7565/1986, recommendations are made solely for the benefit of safety, and shall be treated as established in the NSCA 3-13 "Protocols for the Investigation of Civil Aviation Aeronautical Occurrences conducted by the Brazilian State".

To Brazil's National Civil Aviation Agency (ANAC):

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Work with the *Aeroclube de Fernandópolis*' CIAC (Civil Aviation Instruction Center), seeking to improve its mechanisms for the monitoring and supervision of the practice phase of the piloting instruction, especially in the standardization of their Flight Instructors (INVA) and Coordinators.

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Disseminate the lessons learned in this investigation to the Instruction Centers that provide practice aircraft-piloting courses, in order to raise awareness in the referred Centers of the importance of appropriate managerial oversight, seeking to improve the quality of the piloting instruction and mitigate the risks of aeronautical accidents.

5. CORRECTIVE OR PREVENTATIVE ACTION ALREADY TAKEN.

None.

On January 23th, 2024.