COMANDO DA AERONÁUTICA

CENTRO DE INVESTIGAÇÃO E PREVENÇÃO DE ACIDENTES AERONÁUTICOS

FINAL REPORT
A - 004/CENIPA/2017

OCCURRENCE:	**ACCIDENT**
AIRCRAFT:	**PR-GRS**
MODEL:	**172S**
DATE:	**05JAN2017**

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 taking into account 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 different 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 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. Taking into account 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 05JAN2017 accident with the 172S aircraft, registration PR-GRS. The accident was classified as “[CTOL] Collision with Obstacle during Take-Off and Landing”.

During the final approach to landing, the aircraft crashed into a power line, located near the runway threshold. There was loss of control of the aircraft that collided with the ground.

The aircraft had substantial damage.

The pilot and a passenger died at the crash site. Two other passengers suffered serious injuries.

An Accredited Representative of the National Transportation Safety Board (NTSB) - USA, (State where the aircraft was designed) was designated for participation in the investigation.

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GLOSSARY OF TECHNICAL TERMS AND ABBREVIATIONS

ANAC	Brazil's National Civil Aviation Agency
CA	Airworthiness Certificate
CENIPA	Aeronautical Accident Investigation and Prevention Center
CIV	Pilot's Flight Logbook
CMA	Aeronautical Medical Certificate
IAM	Annual Maintenance Inspection
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
METAR	Meteorological Aerodrome Report
MNTE	Airplane Single Engine Land Rating
PPR	Private Pilot License – Airplane
ROTAER	Auxiliary Air Route Manual
SACI	Integrated Civil Aviation Information System
SDVI	ICAO Locator Designator – Comandante Gastão Aerodrome – Tangará da Serra - MT
SIPAER	Aeronautical Accident Investigation and Prevention System
SSCI	ICAO Locator Designator – Coxim Aerodrome - MS
TPP	Registration Category of Private Service - Aircraft
UTC	Universal Time Coordinated
VFR	Visual Flight Rules

1. FACTUAL INFORMATION.

Aircraft	**Model:** 172S **Registration:** PR-GRS **Manufacturer:** Cessna Aircraft	**Operator:** *Golddencor Corretora de Seguros* LTD.
Occurrence	**Date/time:** 05JAN2017 – 1420 UTC **Location:** Comandante Gastão Aerodrome (SDVI) **Lat.** 14°39'30"S **Long.** 057°29'58"W **Municipality – State:** Tangará da Serra – MT	**Type(s):** [CTOL] Collision with Obstacle during Take-Off and Landing **Subtype(s):** NIL

1.1 History of the flight.

The aircraft took off from Coxim Aerodrome (SSCI) - MS, to the Comandante Gastão (SDVI) Aerodrome, Tangará da Serra - MT, at about 1200 (UTC), with one pilot and three passengers on board.

Next to threshold 33 of SDVI, the aircraft crashed into a power line and then into the ground.

The aircraft had substantial damage.

The pilot and a passenger suffered fatal injuries. Two other passengers suffered serious injuries.

1.2 Injuries to persons.

Injuries	Crew	Passengers	Others
Fatal	1	1	-
Serious	-	2	-
Minor	-	-	-
None	-	-	-

1.3 Damage to the aircraft.

The aircraft had substantial damage.

1.4 Other damage.

Damage to the power line.

1.5 Personnel information.

1.5.1 Crew's flight experience.

Flight Hours	Pilot
Total	132:55
Total in the last 30 days	Unknown
Total in the last 24 hours	03:45
In this type of aircraft	Unknown
In this type in the last 30 days	Unknown
In this type in the last 24 hours	03:45

N.B.: The data related to the flown hours were obtained through the SACI system of the ANAC.

1.5.2 Personnel training.

The pilot took the PPR course at the West Wings *Escola de Aviação* Ltd., in Cascavel, PR, in 2012.

1.5.3 Category of licenses and validity of certificates.

The pilot had the PPR License and valid MNTE Rating.

1.5.4 Qualification and flight experience.

The pilot was qualified but had little experience en-route and had never landed on SDVI.

1.5.5 Validity of medical certificate.

The pilot had valid CMA.

1.6 Aircraft information.

The aircraft, serial number 172S8815, was manufactured by Cessna Aircraft, in 2001, it was registered in the TPP category.

The aircraft had valid Airworthiness Certificate (CA).

The airframe, engine and propeller logbooks were not found.

The last inspection of the aircraft, the "IAM" type, was carried out on 28OCT2016 by the maintenance organization Premium Tec, in Maringá – PR.

1.7 Meteorological information.

According to reports from pilots flying nearby, on the day and time of the accident, weather conditions were favorable for the visual flight, with no ceiling and visibility restrictions, with no strong winds or a significant presence of low clouds.

1.8 Aids to navigation.

Nil.

1.9 Communications.

As reported by pilots flying at the same time, near the place of the occurrence, attempts were made to bilateral contact with the PR-GRS aircraft at the frequency 123.45 MHz, but without success.

It was informed by the aerodrome administrator that the aircraft did not make radio contact the aircraft with ground personnel, as well as, there was no previous contact before the flight.

1.10 Aerodrome information.

The aerodrome was private, ran by Rondon *Aviação Agrícola* Ltd. and operated under Visual Flight Rules (VFR) in the daytime.

The runway was made of gravel, with thresholds 15/33, dimensions of 700m x 25m, with elevation of 1,391 feet.

There was a power line near SDVI threshold 33. This line had orange signs (Figure 1).

Figure 1 – Power line near the threshold 33 of SDVI.

At threshold 33 there was an "X" marking, which was inserted by the Aerodrome administrator to indicate that landing at that threshold was not available (Figures 2 and 3).

Figure 2 - Air view of the “X” marking at threshold 33.

Figure 3 - “X” marking at SDVI threshold 33.

In spite of the existence of a marking indicating that runway 33 was impracticable, this information was not included in the ROTAER in force on 05JAN2017 (Figure 4), since there was no request to the competent body by the Aerodrome administrator.

TANGARÁ DA SERRA / Comandante Gastão, MT SDVI	14 38 44S/057 30 10W
PRIV UTC-4	424 **(1391)**
15 - (700x25 GRVL 57000 kg/0.50Mpa) - **33**	

Figure 4 - Aerodrome information at the ROTAER on 05JAN2017.

The ROTAER in force on 30JAN2018 presented in the field "observations" information that the runway 33 was closed for landings and the runway 15 was closed for takeoffs (Figure 5).

TANGARÁ DA SERRA,MT / Comandante Gastão (SDVI)	14 38 44S/057 30 10W
AD PRIV UTC-4	424 **(1391)**
15 - (700x25 GRVL 57000kg/0.50MPa) - **33**	SBAZ (CINDACTA 4)
RMK - a. Circuito de TFC devera ser realizado pelos SECT NW e SW do AD somente ACFT CAT "A" poderão OPR. b. RWY 33 CLSD LDG e RWY 15 CLSD TKOF. c. OBST (poste) NEG LGTD COORD 143906,54S/0572957,06W ELEV 446M montado.	

Figure 5 - Aerodrome information at the ROTAER on 30JAN2018.

1.11 Flight recorders.

Neither required nor installed.

1.12 Wreckage and impact information.

The collision was observed by witnesses who were in the vicinity of the aerodrome.

The first impact occurred against the power line near the threshold 33 of SDVI. The aircraft was in the normal attitude of a final approach. After the impact, the aircraft appeared to have a pitch down attitude, apparently without control.

The second impact occurred against the ground, near the threshold 33, maintaining an angle of approximately 135° to the axis of the runway (Figure 6).

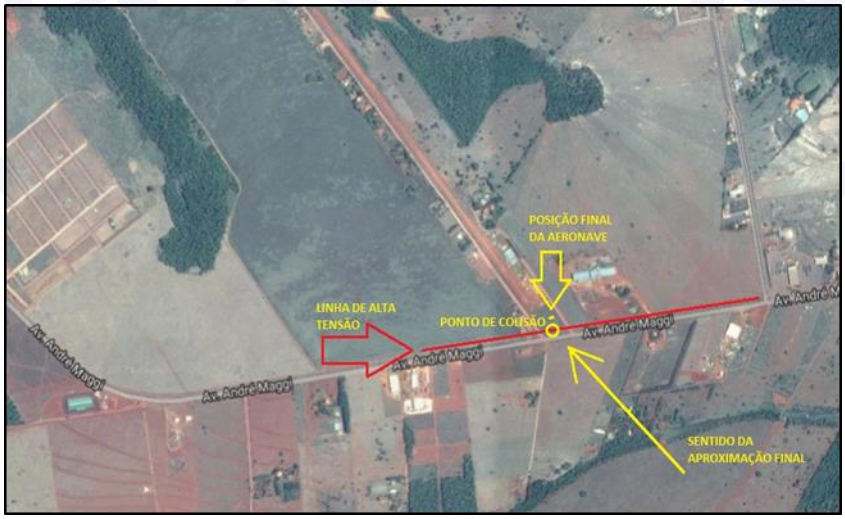

Figure 6 - Diagram of the accident.

The verification of the wreckage evidenced that the engine of the aircraft developed power at the moment of the impact against the ground.

1.13 Medical and pathological information.

1.13.1 Medical aspects.

No evidence was found that problems of physiological nature could have affected the flight crew performance.

1.13.2 Ergonomic information.

Nil.

1.13.3 Psychological aspects.

The pilot was known in the city of Cascavel. Reports defined him as a centered, meticulous, balanced, autonomous, and socially friendly person.

As reported, as the flights were occasional, he did not possess the typical ability of pilots who fly regularly. However, he was perceived as a self-confident pilot.

The day before the accident, the pilot and family spent the night at a friend's farm in the town of Caarapó - MS.

According to reports, the pilot had slept and fed well, presenting himself physically and psychologically healthy to perform the flight the next morning.

According to the survivors, the pilot and his relatives were traveling with the purpose of knowing a reforestation project.

The flight destination was the city of Tangará da Serra - MT. There is no information that the pilot has considered landing on the main runway of the city.

According to data received, it was likely that the option for the farm runway was motivated by the proximity of shops and agricultural aircraft, facilitating the guarding of the aircraft, since the main runway of the city was in an isolated area.

That would be the first time the pilot was going to operate on the farm runway, as his fellow pilots reported. However, the interviewees reported that they did not know the intentions of landing on SDVI, otherwise they would have alerted him to the presence of wires in the power line.

As reported, there was no previous aerodrome flyover for site recognition, and the pilot made a direct approach to the runway.

According to the information obtained, the pilot had the habit of abbreviating traffic, making approximations lower than usual (below the standard traffic altitude).

Survivors reported that moments before the aircraft collided, they kept their eyes on the landscape while the pilot was conducting radio communications.

They said they did not remember the height they were in and that they had no view of the runway because they were in the back seats of the aircraft. When they noticed the wires of the power line, they were already very close. They heard a burst and the plane crashed.

1.14 Fire.

There was no fire.

1.15 Survival aspects.

The passengers in the rear seats survived, but suffered serious injuries, being rescued by a group of firefighters.

1.16 Tests and research.

Nil.

1.17 Organizational and management information.

Nil.

1.18 Operational information.

The aircraft was within the weight and balance limits specified by the manufacturer.

The pilot involved in the accident was also the owner of the aircraft. He flew, on average, two to three times a month, for professional and leisure purposes.

Reports said that during his training, the pilot was given separate flight instructions before proceeding to the formal instruction of the pilot school.

As informed, the pilot performed the minimum flight hours planned for the training and concluded the course with some difficulties regarding standardized in-flight communication.

1.19 Additional information.

Nil.

1.20 Useful or effective investigation techniques.

Nil.

2. ANALYSIS.

This was a personal transportation flight from Coxim - MS to Tangará da Serra - MT, in order to know a reforestation project.

There was no evidence of influence of the aircraft systems for the occurrence of the accident. The verification of the wreckage showed that the engine of the aircraft developed power at the moment of the impact against the ground.

According to reports, meteorological conditions were favorable for the visual flight, with no ceiling and visibility restrictions and with no strong winds that could have hampered to maintain the aircraft control during the flight, nor significant presence of low clouds that obliged the pilot to maintain a flight at a lower altitude than that expected for a standard traffic circuit.

However, according to the information obtained, it was customary for the pilot to make lower approaches than usual. This practice, although common to the pilot, could favor a potential risk increase during the procedure and, consequently, compromise safety.

There was no previous contact with the administrator about aerodrome information. According to the survivors, the pilot did not perform standard traffic circuit, proceeding straight to a long final approach.

According to the report of the aerodrome administrator, it was customary the landing of private aircraft without previous contact.

The pilot was qualified for the type of flight, but had little experience, approximately 133 total flight hours, and had never landed on the locality.

Near the destination, the pilot decided to proceed with a flight at low altitude. As they approached the landing at threshold 33, everyone saw the power line, but there was no longer time and distance to make a detour. After the collision, a sudden burst was heard and the fall occurred.

The wire provided sufficient resistance to cause loss of control of the aircraft, leading to lowering of the nose.

Due to the proximity to the ground, there was no time for the pilot to correct the attitude of the pitch flight, resulting in the collision against the ground.

The lack of familiarity with the locality, allied to the habits acquired by the pilot and his little experience of flight, favored an inadequate evaluation of that context.

Thus, by not conducting a flyover to check for obstacles and opt for a procedure divergent from the standard traffic for visual landing, the operating conditions have become unfavorable for the correct perception of the power line.

The power line had orange signs, so that they could be viewed during, for example, an aerodrome check pass.

However, as reported by survivors, the approach was direct to landing and, possibly, this signaling was not seen by the pilot.

At threshold 33 of the aerodrome, there was an "X" mark, which was inserted by the aerodrome administrator to indicate that landing at that threshold would be impracticable. However, this information was not included in the current ROTAER, since there was no request for inclusion by the aerodrome administrator to the competent body.

3. CONCLUSIONS.

3.1 Facts.

a) the pilot had valid Aeronautical Medical Certificate (CMA);

b) the pilot had valid MNTE Rating;

c) the pilot was qualified, however, had little experience in that type of flight;

d) the aircraft had valid Airworthiness Certificate (CA);

e) the aircraft was within the limits of weight and balance;

f) the airframe, engine and propeller logbooks were not found;

g) it was reported that the meteorological conditions were favorable for the flight accomplishment;

h) there was no information at the ROTAER about the interdiction of SDVI runway 33;

i) during the final approach to SDVI, the aircraft collided with a power line and, then, against the ground;

j) the aircraft had substantial damage; and

k) the pilot and one passenger suffered fatal injuries and two passengers suffered serious injuries.

3.2 Contributing factors.

- **Attitude – a contributor.**

The practices adopted by the pilot in making the approach to the landing directly, diverging from the standard traffic for visual landing, signaled the non-observance of the planned procedures, denoting an improvisation attitude that increased the potential risk of the operation.

- **Piloting judgement – a contributor.**

There was inadequate evaluation by the pilot of certain parameters, such as the type of the approach, diverging from the standard traffic circuit, as well as the lack of coordination in the radio frequency, leading to the accident.

- **Perception – a contributor.**

In spite of the existence of the power line signaling near the aerodrome, as well as the "X" marking indicating the impracticability of the runway, the pilot did not notice them, possibly, for failing to perform some basic procedures for landing on an unknown runway, like obstacle check, bilateral free-frequency radio contact and standard traffic for visual landing.

- **Flight planning – a contributor.**

There was no prior consultation with the intended aerodrome administrator, causing the lack of information about power line at one of the runway thresholds, as well as the interdiction of the SDVI threshold 33 for landing.

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

The pilot had little experience of flying, and had never landed on the runway where the accident occurred.

- **Decision-making process – a contributor.**

The procedures performed during the landing approach denoted a precarious assessment of that operational context, which contributed to the accident, as it provided unfavorable conditions to the proper perception of the existing obstacles.

4. SAFETY RECOMMENDATION.

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 addition to safety recommendations arising from accident and incident investigations, safety recommendations may result from diverse sources, including safety studies.

In consonance with the Law n°7565/1986, recommendations are made solely for the benefit of the air activity operational 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".

Recommendations issued prior to the publication of this report:

Nil.

5. CORRECTIVE OR PREVENTATIVE ACTION ALREADY TAKEN.

All specific landing information at the SDVI Aerodrome has been added to the digital ROTAER.

On October 28th, 2019.