COMANDO DA AERONÁUTICA

CENTRO DE INVESTIGAÇÃO E PREVENÇÃO DE ACIDENTES AERONÁUTICOS

FINAL REPORT
A - 509/CENIPA/2018

OCCURRENCE:	**ACCIDENT**
AIRCRAFT:	**PR-LJL**
MODEL:	**SR20**
DATE:	**26NOV2011**

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 26NOV2011 accident with the SR20 aircraft, registration PR-LJL. The accident was classified as “[LOC-I] Loss of Control in Flight”.

During the en-route flight, the aircraft entered into Cumulonimbus-type (CB) cloud formations, losing control and colliding with the ground.

The aircraft was destroyed.

The pilot and the passenger suffered fatal injuries.

An Accredited Representative of the National Transportation Safety Board (NTSB) - USA, (State where the aircraft was designed and manufactured) 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
CB	Cumulonimbus Cloud
CCF	Physical Capacity Certificate
CENIPA	Aeronautical Accident Investigation and Prevention Center
CIV	Pilot's Flight Logbook
FIAM	Annual Maintenance Inspection Form
IFR	Instrument Flight Rules
IFRA	Instrument Flight Rating - Airplane
METAR	Meteorological Aerodrome Report
NSCA	Aeronautics Command System Standard
NTSB	National Transportation Safety Board (USA)
PPR	Private Pilot License – Airplane
REDEMET	Aeronautics Command Meteorology Network
SBBH	ICAO Locator Designator – Pampulha Aerodrome - Carlos Drummond de Andrade, Belo Horizonte - MG
SBPR	ICAO Locator Designator – Carlos Prates Aerodrome, Belo Horizonte - MG
SIGWX	Significant Weather
SIPAER	Aeronautical Accident Investigation and Prevention System
SNUH	ICAO Locator Designator - Sebastião Gomes de Souza Aerodrome, Piumhi - MG
TPP	Registration Category of Private Service - Aircraft
UTC	Universal Time Coordinated

1. FACTUAL INFORMATION.

Aircraft	**Model:** SR20 **Registration:** PR-LJL **Manufacturer:** Cirrus Design	**Operator:** Private
Occurrence	**Date/time:** 26NOV2011 - 1300 UTC **Location:** *Fazenda da Mata* **Lat.** 20°08'46"S **Long.** 044°41'26"W **Municipality – State:** *Carmo do Cajuru* – MG	**Type(s):** [LOC-I] Loss of Control in Flight **Subtype(s):** NIL

1.1 History of the flight.

The aircraft took off from the Carlos Prates Aerodrome (SBPR), Belo Horizonte - MG, to the Sebastião Gomes de Souza Aerodrome (SNUH), Piumhi - MG, at about 1230 (UTC) in order to transport personnel, with a pilot and a passenger on board.

With approximately thirty minutes of flight, flying over the rural area of the municipality of Carmo do Cajuru - MG, the aircraft entered Cumulonimbus (CB) cloud formations, got out of the clouds uncontrollably, lost altitude, and collided against the ground.

The aircraft was destroyed.

The pilot and passenger suffered fatal injuries.

Figure 1 - Aircraft wreckage.

1.2 Injuries to persons.

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

1.3 Damage to the aircraft.

The aircraft was destroyed.

1.4 Other damage.

None.

1.5 Personnel information.

1.5.1 Crew's flight experience.

Flight Hours	
	Pilot
Total	422:00
Total in the last 30 days	02:35
Total in the last 24 hours	02:35
In this type of aircraft	364:35
In this type in the last 30 days	02:35
In this type in the last 24 hours	02:35

N.B.: The data related to the flown hours were obtained through the Pilot's Flight Logbook (CIV).

1.5.2 Personnel training.

The pilot took the PPR course at the Carlos Prates Aeroclub, in Belo Horizonte -MG, in 2007.

1.5.3 Category of licenses and validity of certificates.

The pilot had the PPR License and valid MNTE and IFRA Ratings.

1.5.4 Qualification and flight experience.

The pilot was qualified, but had little experience in IFR.

1.5.5 Validity of medical certificate.

The pilot had valid CCF.

1.6 Aircraft information.

The aircraft, serial number 1955, was manufactured by Cirrus Design, in 2008, and 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 "50 hours" type, was carried out on 11NOV2011 by the maintenance organization *América do Sul Serviços Aeronáuticos*, in Sorocaba – SP, having flown 2 hours and 35min after the inspection.

The aircraft did not have performed any overhaul.

No discrepancies were found in the aircraft FIAM.

1.7 Meteorological information.

The METAR of the Pampulha Aerodrome - Carlos Drummond de Andrade (SBBH) - MG, 29 nautical miles away from the scene of the accident had the following information:

METAR SBBH 261200Z 06002KT 8000 -RA BKN012 SCT030 BKN090 22/19 Q1017=

METAR SBBH 261300Z 09006KT 9999 BKN012 SCT030 BKN090 23/18 Q1017=

It was found that the conditions were visibility of 8.000m, moderate rain, cloudy at 1.200ft and scattered clouds at 3,000ft. The wind had intensity of 2kt.

The SIGWX, valid until 1200 (UTC), illustrated the presence of isolated Cumulonimbus (CB) clouds based on 2,500ft.

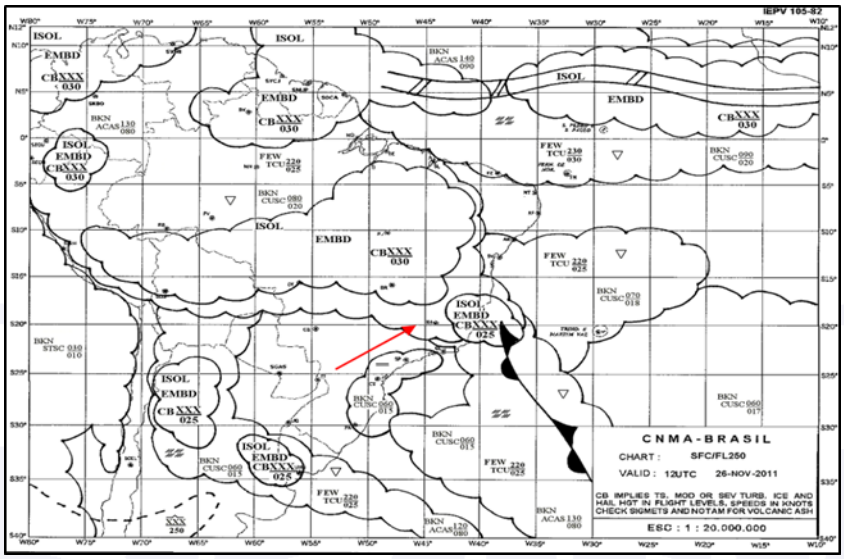

Figure 2 - REDEMET 26NOV2011 SIGWX chart.

The satellite image of South America, on the day of this occurrence, presented the Minas Gerais State quite covered by clouds (Figure 3).

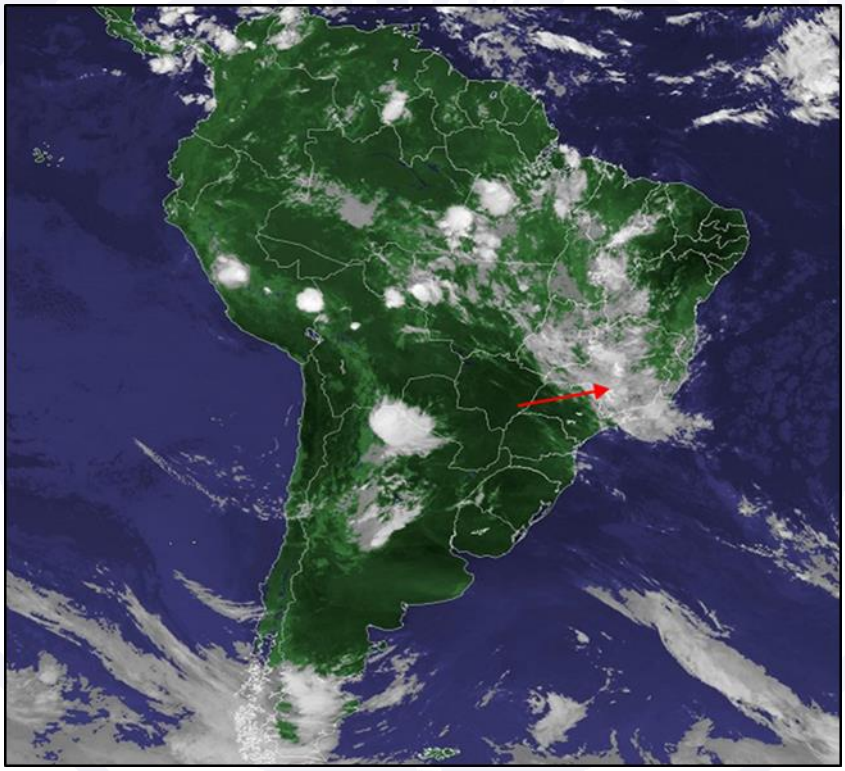

Figure 3 – The Minas Gerais State covered by clouds.

According to reports by ground-based observers, the meteorological conditions, near the accident site were very intense rain, with strong winds and gusts, which would be compatible with the formations of CB indicated in the meteorological forecasts and satellite images.

1.8 Aids to navigation.

Nil.

1.9 Communications.

There was no record of the pilot's communications with the air traffic control, about any emergency.

1.10 Aerodrome information.

The occurrence took place outside the aerodrome.

1.11 Flight recorders.

Neither required nor installed.

1.12 Wreckage and impact information.

The aircraft crashed into the terrain with low trajectory angle and high speed, spreading the wreckage within a radius of 150m.

The distribution of the wreckage was predominantly linear, and a basic course around 240º could be indicated.

At the core of the wreckage, there were various items from the cockpit, the engine and the electrical part of the aircraft.

The great energy of the impact against the ground caused damage, deforming and fragmenting the components of the aircraft.

The propeller was located separate from the engine, exhibiting characteristic of high rotation impact damage, indicating that it was in operation.

The marks left on the ground, the distribution of the wreckage and damage to the vegetation showed that the aircraft collided with the ground at high speed and practically on the horizontal.

1.13 Medical and pathological information.

1.13.1 Medical aspects.

Not investigated.

1.13.2 Ergonomic information.

Nil.

1.13.3 Psychological aspects.

Not investigated.

1.14 Fire.

There was no fire.

1.15 Survival aspects.

Nil.

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 was certified to fly under instrument flight rules (IFR), but had only five hours of instrument flight recorded in the CIV.

According to reports from people close to the pilot, he often stated that he avoided clouds during flight because he did not feel safe to fly the aircraft under adverse weather conditions.

The aircraft ballistic parachute was not activated.

According to reports from observers who were at the accident site at the time of the fall, the aircraft entered a formation of dark clouds and was then seen getting out of the clouds in an uncontrolled way.

According to these observers, the plane continued to lose altitude, but stabilized its wings before colliding with the ground.

1.19 Additional information.

Nil.

1.20 Useful or effective investigation techniques.

Nil.

2. ANALYSIS.

This was a personal transport flight from SBPR to SNUH.

The pilot owned the aircraft. He had 422 total flight hours, including 364 hours on the aircraft itself. Although he was certified to fly by instruments, it had only five hours of IFR flight registered in the CIV.

Some people who knew the pilot stated that he reported that he did not feel safe to fly under adverse weather conditions, even though he was rated, and therefore avoided clouds.

According to observers, the weather conditions in the region where the accident occurred were not favorable for the visual flight and, according to the SIGWX chart, there were the presence of isolated clouds of the CB type, in the aircraft flight trajectory. This information was corroborated by the satellite image, highlighting a cloud cover over the entire state of Minas Gerais.

People in the vicinity reported that there was very intense rainfall, with strong winds and gusts shortly after the occurrence, which would be compatible with the CB formations indicated in the weather forecasts and satellite images previously mentioned.

According to observers' reports, the aircraft entered a CB formation, from which he got out uncontrollably and lost altitude, stabilizing the wings before colliding against the ground.

When considering the reports about the behavior of the aircraft, it is possible to infer that the pilot became disoriented during the time he was in the clouds and before the collision. He attempted to recover control of the aircraft and to stabilize it, in which he was unsuccessful.

In this scenario, modifying visual flight conditions for instrument flight with strong winds and gusts at the time he entered the CB, may have led the aircraft to abnormal attitudes.

It is possible that this situation, together with the little experience in this type of flight, has generated favorable conditions for spatial disorientation, resulting in the loss of control of the aircraft and the accident.

The marks left in the ground, the distribution of the wreckage and the damages caused to the vegetation indicated that, at the moment of the collision, the aircraft had a low trajectory angle, in high speed and horizontal displacement, spreading the wreckage for a distance of approximately 150m.

There were indications that the engine would be in operation at the time of impact.

The non-triggering of the aircraft ballistic parachute, associated with a lack of communication on an emergency to air traffic control bodies, suggests that there was no aircraft system with abnormal operation at the time of the occurrence.

3. CONCLUSIONS.

3.1 Facts.

a) the pilot had valid CCF;

b) the pilot had valid MNTE and IFRA Ratings;

c) the pilot was qualified, but had little experience in IFR;

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) the weather conditions were not favorable for the visual flight;

h) in the area of the aircraft flight trajectory, there was the presence of isolated Cumulonimbus clouds;

i) the propeller was located separate from the engine, presenting rotation characteristics of high speed, at the moment of impact;

j) no emergency was reported to the air traffic control bodies;

k) the ballistic parachute of the aircraft was not activated;

l) the aircraft was destroyed; and

m) the pilot and passenger suffered fatal injuries.

3.2 Contributing factors.

- **Disorientation – undetermined.**

It is possible that the pilot has become spatially disoriented after entering into instrument flight conditions and thus has lost references that could properly delineate the position of the aircraft relative to the ground, culminating in the loss of the ability to control the aircraft.

- **Piloting judgment – undetermined.**

The decision to enter into heavy weather formations may have contributed to a possible spatial disorientation and subsequent loss of control of the aircraft.

- **Perception – undetermined.**

The adverse weather conditions encountered during the flight, as well as the entry of the aircraft between the clouds, may have caused difficulties in maintaining visual references to the terrain, making it impossible to notice the position of the aircraft in relation to the ground in adequate time to avoid collision.

- **Insufficient pilot's experience – undetermined.**

Despite having the IFRA rating, the lack of experience in this type of flight may have favored a possible spatial disorientation, impairing the ability to control the aircraft.

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 at the publication of this report:

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

A-509/CENIPA/2018 - 01 **Issued on 28/06/2019**

Disseminate the lessons learned in the present investigation, in order to alert the Brazilian civil aviation pilots and operators about the risks inherent to the adverse weather conditions.

5. CORRECTIVE OR PREVENTATIVE ACTION ALREADY TAKEN.

None.

On June 28th, 2019.