

COMANDO DA AERONÁUTICA
CENTRO DE INVESTIGAÇÃO E PREVENÇÃO DE
ACIDENTES AERONÁUTICOS



FINAL REPORT
A - 007/CENIPA/2015

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|--------------------|------------------|
| OCCURRENCE: | ACCIDENT |
| AIRCRAFT: | PT-FFH |
| MODEL: | A-188B |
| DATE: | 14JAN2015 |



NOTICE

According to the Law n° 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 item 3.1, Annex 13 to the 1944 Chicago Convention, which was incorporated in the Brazilian legal system by virtue of the Decree n° 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 14 January 2015 accident with the A188B aircraft, registration PT-FFH. The event was classified as “in flight collision with obstacle”.

While operating a crop-dusting flight, the aircraft collided with a concrete pole, hit the ground in an uncontrollable manner, and came to a stop in an upside-down position.

The aircraft sustained substantial damage.

The pilot was killed in the accident.

An accredited representative from the US National Transportation Safety Board – NTSB, state of design, was designated for participation in the investigation.



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GLOSSARY OF TECHNICAL TERMS AND ABBREVIATIONS

| | |
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| ANAC | Brazil's National Civil Aviation Agency |
| CENIPA | Aeronautical Accident Investigation and Prevention Center |
| CM | Registration Certificate |
| IAM | Annual Maintenance Inspection |
| Lat | Latitude |
| Long | Longitude |
| MNTE | Airplane, Single-Engine, Land - ASEL |
| PAGA | Agricultural Pilot |
| PCM | Commercial Pilot – airplane category |
| PPR | Private Pilot – airplane category |
| RS | Safety Recommendation |
| SAE - S05 | Specialized Air Services |
| SERIPA II | Second Regional Aeronautical Accident Investigation and Prevention Service |
| SIPAER | Aeronautical Accident Investigation and Prevention System |
| UTC | Universal Time Coordinated |
| VFR | Visual Flight Rules |

1. FACTUAL INFORMATION.

| | | | |
|------------|---|--|---|
| Aircraft | Model: | A-188B | Operator: Globo Aviação Agrícola Ltda. |
| | Registration: | PT-FFH | |
| | Manufacturer: | Cessna Aircraft | |
| Occurrence | Date/time: | 14JAN2015 / 10:50 UTC | Type(s): Inflight collision with obstacle. |
| | Location: | Fazenda Cremaq Brasil Agro | |
| | Lat. 08°11'55"S Long. 045°13'54"W | | |
| | Municipality – State: | Baixa Grande do Ribeiro – State of Piauí | |

1.1 History of the flight.

The aircraft departed with a crew of one on a crop dusting flight.

After making a pass over a corn plantation for spraying pesticide, the aircraft collided with a concrete pole.

Following this collision, the aircraft touched the ground in an uncontrolled manner 230 meters ahead, and stopped upside down.

The aircraft sustained substantial damage.

The pilot received fatal injuries.

1.2 Injuries to persons.

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

1.3 Damage to the aircraft.

The aircraft sustained substantial damage to the main landing gear, wings, engine, and propeller. The pilot seat detached from the aircraft cockpit.

1.4 Other damage.

A concrete pole installed on the farm to hold power lines was damaged.

1.5 Personnel information.

1.5.1 Crew's flight experience.

| Hours Flown | |
|-----------------------------------|----------|
| | Pilot |
| Total | 1,340:10 |
| Total in the last 30 days | 13:25 |
| Total in the last 24 hours | 02:15 |
| In this type of aircraft | 536:20 |
| In this type in the last 30 days | 13:25 |
| In this type in the last 24 hours | 02:15 |

N.B.: Data provided by the operator.

1.5.2 Personnel training.

[The pilot took his Private Pilot course at the *Aeroclube de Eldorado do Sul*, State of *Rio Grande do Sul*, in 2008.]

1.5.3 Category of licenses and validity of certificates.

[The pilot had a Commercial Pilot license, and a valid agricultural-pilot technical qualification certificate.]

1.5.4 Qualification and flight experience.

[The pilot had qualification and enough experience for the flight in question.]

1.5.5 Validity of medical certificate.

[The pilot had a valid Aeronautical Medical Certificate.]

1.6 Aircraft information.

[The serial number 18803819T aircraft was manufactured by Cessna Aircraft in 1981, and was registered in the Specialized Air Services Category (SAE - S05).

The aircraft airworthiness certificate was valid.

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

The last inspection of the aircraft (type “100 hours / IAM) was done by the *CDE Aviação* workshop in *Redenção*, State of *Pará*, on 22 October 2014. The aircraft flew 13 hours and 25 minutes after the inspection.

The last overhaul of the aircraft (type “200 hours”) was carried out by *CDE Aviação* workshop in *Redenção*, State of *Pará*, on 5 March 2014. The aircraft flew 120 hours and 25 minutes after the overhaul.

The airframe total flight-time amounted to 8,356 hours and 20 minutes.]

1.7 Meteorological information.

[According to information provided by witnesses, the weather conditions at the moment of the accident were favorable for VFR flights.]

1.8 Aids to navigation.

[Nil.]

1.9 Communications.

[Nil.]

1.10 Aerodrome information.

[The accident occurred outside of an aerodrome area.]

1.11 Flight recorders.

[Neither required nor installed.]

1.12 Wreckage and impact information.

[The aircraft collided with a concrete pole located in the direction of the application pass. The airplane hit the ground 230 meters ahead of the initial point of impact, and stopped with its upside down. A piece of the pole was later found in the mid of the wreckage.]



Figure 1 – Wreckage of the aircraft.



Figure 2 – Fragment of the concrete pole amid the aircraft wreckage.

There were small fragments of the aircraft near the concrete pole involved in the collision. The majority of the aircraft components remained concentrated at the final resting position of the airplane.



Figure 3 – Pole hit by the aircraft.



Figure 4 – Fragment of the propeller blade found near the concrete pole hit by the aircraft.

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.

[No signs of either inflight or post-impact fire.]

1.15 Survival aspects.

[The pilot was wearing individual protection equipment, and his helmet was equipped with a visor for protection against the sun light. Such equipment, however, did not prevent him from suffering fatal injuries.]

1.16 Tests and research.

[During the field investigation following the accident, verification of the wreckage did not reveal any aircraft anomalies that could have contributed to the occurrence.]

1.17 Organizational and management information.

[The investigation did not confirm participation of the company either in the process of planning or the monitoring of the flight, especially in relation to the identification of the hazards and management of the risks associated with the operation in particular.]

1.18 Operational information.

[The aircraft was within the prescribed weight and balance parameters specified by the manufacturer.

The pilot took the agricultural pilot course in 2012, earning his technical qualification certificate (*PAGA*) in September of the same year. In the following year, he was hired by Globo Aviação Agrícola Ltda. to operate the Cessna A188B aircraft.

The pilot successfully operated the model of aircraft involved in the accident in two consecutive harvests. He had already operated crop-dusting flights in the plantation of the farm where the accident occurred.

Aircraft departed from, and landed on, a landing strip located on the farm. Before taking off, the pilot used to make the weight and balance calculations, and would request the landing strip assistant to perform the ground procedures with safety.

On the day of the accident, the aircraft was prepared as usual for crop-dusting a corn plantation. Before the flight of the occurrence, the pilot had already operated four flights, and did not report any discrepancies as to the operation of the aircraft.

The pilot was knowledgeable of the existence of concrete poles near the plantation where the crop-dusting was to occur, since he had operated in the same location the day before and was familiarized with the obstacles.

In addition, before the aircraft took off, the landing strip assistant reminded the pilot of the existence of the poles.

The distance between the concrete poles was approximately 90 meters. The pole that was hit was located in the direction of the aircraft movement, close to the end of the corn plantation.

There were no electric wires connecting the poles.

At the moment of the accident (07:50 local time), the fact that the low pass was being made in the direction southeast/northeast left the sun at the 1 o'clock position in relation to the aircraft trajectory.

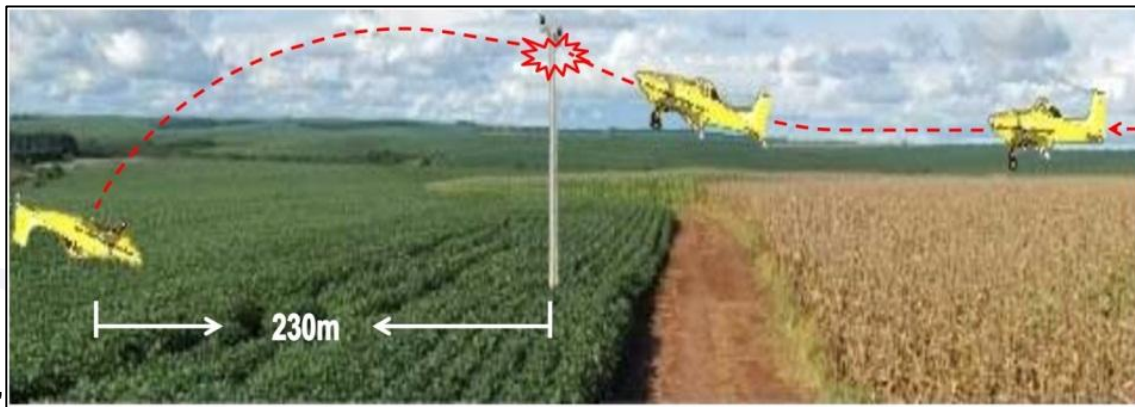


Figure 5 – Vertical profile of the aircraft trajectory relative to the pole.

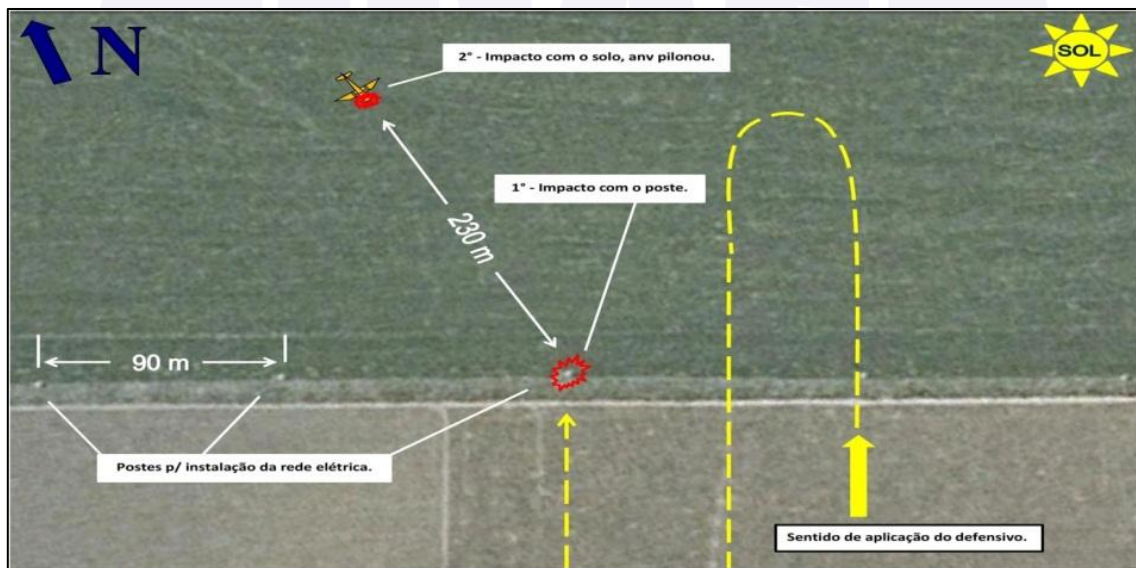


Figure 6 – Horizontal profile of the aircraft trajectory relative to the obstacles and position of the sun.

1.19 Additional information.

[Nil.]

1.20 Useful or effective investigation techniques.

[Nil.]

2. ANALYSIS.

The accident occurred in the morning period, after the fifth takeoff of the day.

No evidence was found concerning a failure of component or failure in the aircraft maintenance that might have contributed to the occurrence.

The pilot had experience in agricultural aviation, as well as in the operation of the aircraft involved in the accident, since he had worked for the same company in the two earlier harvests.

The pilot was knowledgeable of the concrete pole in the area to be overflown, since he had flown the day before the accident, and had seen those obstacles. Besides, a runway assistant had also reminded the pilot of the existence of the concrete poles.

The fact that the lines had not been installed in the poles may have diminished the pilot's perception, since the aircraft could fly at low altitude between the poles without having to climb to stay clear of the lines.

The pilot may not have seen the pole, since the absence of lines and its isolated location made it difficult to be sighted.

Considering that the direction of the low pass was in the direction southeast/northeast, in addition to the position of the sun at the moment of the accident, it is possible that the pilot's was impaired, making it even more difficult for him to sight the concrete pole.

Such operating conditions, without a more detailed analysis of the risks involved, may have resulted in a decrease of the pilot's situational awareness, leading him to disregard the special care required by the operation.

3. CONCLUSIONS.

3.1 Facts.

- a) The pilot had a valid aeronautical medical certificate;
- b) The pilot had valid certificates;
- c) The pilot had qualification and enough experience for the type of flight;
- d) The aircraft had a valid airworthiness certificate;
- e) The aircraft was within the prescribed weight and balance parameters;
- f) The records of the airframe, engine, and propeller logbooks were up-to-date;
- g) The meteorological conditions were appropriate for the conduction of the flight;
- h) The aircraft was engaged in a crop-dusting flight;
- i) The pilot was knowledgeable of the existing obstacles in the area to be overflown by the aircraft;
- j) The sun was at the 1 o'clock position in relation to the aircraft trajectory
- k) After an application pass, the aircraft collided with a concrete pole;
- l) After the collision, the aircraft hit the ground out of control, and stopped upside down at a distance of approximately 230 meters;
- m) The aircraft sustained substantial damage; and
- n) The pilot perished in the crash site.

3.2 Contributing factors.

- **Influence from the environment – undetermined.**

The position of the sun at the moment of the occurrence may have impaired the pilot's vision, making it difficult for him to sight the concrete pole.

- **Piloting judgment – undetermined.**

The pilot may have estimated incorrectly the distance between the aircraft and the obstacle.

- **Flight planning – undetermined.**

The pilot may have failed to adequately consider the risk posed by the concrete poles to the operation, since they did not have the power transmission electric lines.

- **Managerial oversight – undetermined.**

The monitoring of the phases of planning and conduction of the flight by the aircraft operator may have been inadequate, especially in relation to the identification and management of the risks.

4. SAFETY RECOMMENDATION.

A measure of preventative/corrective nature issued by a SIPAER Investigation Authority or by a SIPAER-Link within respective area of jurisdiction, aimed at eliminating or mitigating the risk brought about by either a latent condition or an active failure. It results from the investigation of an aeronautical occurrence or from a preventative action, and shall never be used for purposes of blame presumption or apportion of civil, criminal, or administrative liability.

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-007/CENIPA/2015 - 01

Issued on 08/02/2017

Take the necessary measures before the Operator, aiming at verifying the effectiveness of the Managerial Oversight mechanisms relative to the agricultural aviation activities, mainly with respect to the identification and management of the operational risks.

5. CORRECTIVE OR PREVENTATIVE ACTION ALREADY TAKEN.

[None.]

On, February 08th 2017.