

COMANDO DA AERONÁUTICA

CENTRO DE INVESTIGAÇÃO E PREVENÇÃO DE ACIDENTES AERONÁUTICOS



FINAL REPORT A - 128/CENIPA/2017

OCCURRENCE:	ACCIDENT
AIRCRAFT:	PR-XLX
MODEL:	EA 300/LC
DATE:	12OCT2017



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 12OCT2017 accident with the EA 300/LC aircraft model, registration PR-XLX. The accident was classified as “[LOC-I] Loss of Control in Flight”.

During the take-off, shortly after leaving the ground, the pilot placed the aircraft in an inverted flight, still at low altitude, and, subsequently, the plane collided with the runway.

The aircraft had substantial damage.

The pilot left unharmed.

An Accredited Representative of the *Bundesstelle für Flugunfalluntersuchung* (BFU) - Germany, (State where the aircraft was manufactured) was designated for participation in the investigation.



CONTENTS

GLOSSARY OF TECHNICAL TERMS AND ABBREVIATIONS	5
1. FACTUAL INFORMATION.	6
1.1 History of the flight.	6
1.2 Injuries to persons.	6
1.3 Damage to the aircraft.	6
1.4 Other damage.	7
1.5 Personnel information.	7
1.5.1 Crew's flight experience.	7
1.5.2 Personnel training.	7
1.5.3 Category of licenses and validity of certificates.	7
1.5.4 Qualification and flight experience.	7
1.5.5 Validity of medical certificate.	8
1.6 Aircraft information.	8
1.7 Meteorological information.	9
1.8 Aids to navigation.	9
1.9 Communications.	9
1.10 Aerodrome information.	9
1.11 Flight recorders.	9
1.12 Wreckage and impact information.	9
1.13 Medical and pathological information.	10
1.13.1 Medical aspects.	10
1.13.2 Ergonomic information.	11
1.13.3 Psychological aspects.	11
1.14 Fire.	11
1.15 Survival aspects.	11
1.16 Tests and research.	11
1.17 Organizational and management information.	11
1.18 Operational information.	12
1.19 Additional information.	13
1.20 Useful or effective investigation techniques.	13
2. ANALYSIS.	13
3. CONCLUSIONS.	14
3.1 Facts.	14
3.2 Contributing factors.	15
4. SAFETY RECOMMENDATION.	16
5. CORRECTIVE OR PREVENTATIVE ACTION ALREADY TAKEN.	16

GLOSSARY OF TECHNICAL TERMS AND ABBREVIATIONS

ACRO	Aerobatics Rating
ANAC	Brazil's National Civil Aviation Agency
BFU	Bundesstelle für Flugunfalluntersuchung
CA	Airworthiness Certificate
CENIPA	Aeronautical Accident Investigation and Prevention Center
CIV	Pilot's Flight Logbook
CMA	Aeronautical Medical Certificate
DAESP	São Paulo Air Department
EUA	United States of America
FCA	Aeronautical Coordination Frequency
IFRA	Instrument Flight Rating - Airplane
INVA	Flight Instructor Rating - Airplane
METAR	Meteorological Aerodrome Report
MNTE	Airplane Single Engine Land Rating
NSCA	Aeronautics Command System Standard
PCM	Commercial Pilot License – Airplane
POH	Pilot's Operating Handbook
PPR	Private Pilot License – Airplane
PRI	Private Aircraft Registration Category - Instruction
RBAC	Brazilian Civil Aviation Regulation
SBKP	ICAO Location Designator – Viracopos International Aerodrome, Campinas - SP
SDAM	ICAO Location Designator – Prefeito Francisco Amaral Aerodrome, Campinas - SP
SIPAER	Aeronautical Accident Investigation and Prevention System
UTC	Universal Time Coordinated
VFR	Visual Flight Rules

1. FACTUAL INFORMATION.

Aircraft	Model: EA 300/LC Registration: PR-XLX Manufacturer: Extra Flugzeugproduktions - und Vertrieb	Operator: Sierra Bravo Aviation <i>Escola de Aviação Civil</i> LT-EPP
Occurrence	Date/time: 12OCT2017 - 1900 UTC Location: Prefeito Francisco Amaral Aerodrome (SDAM) Lat. 21°51'33"S Long. 042°27'32"W Municipality – State: Campinas – SP	Type(s): “[LOC-I] Loss of Control in Flight” Subtype(s): Nil

1.1 History of the flight.

The aircraft took off from the Prefeito Francisco Amaral Aerodrome (SDAM), Campinas - SP, at about 1900 (UTC), in order to perform a local aerobatics flight, with a pilot on board.

Shortly after leaving the ground, the pilot placed the aircraft in an inverted flight, still on the runway. During the flight under these conditions, there was contact of the vertical stabilizer/directional rudder with the pavement and, subsequently, loss of control.

The plane dragged along the runway, swerved to the left, passed its lateral limit and stopped in the adjacent grassy area, maintaining the dorsal position.

The aircraft had substantial damage. The pilot left unharmed.

1.2 Injuries to persons.

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

1.3 Damage to the aircraft.

The aircraft had substantial damage to the vertical stabilizer, rudder, engine, propeller, right wing, canopy, engine hood and spinner.



Figure 1 - Damage to the vertical stabilizer and rudder.



Figure 2 - Engine hood, spinner and propeller damage.

1.4 Other damage.

None.

1.5 Personnel information.

1.5.1 Crew's flight experience.

Flight Hours	Pilot
Total	3.000:00
Total in the last 30 days	03:00
Total in the last 24 hours	00:00
In this type of aircraft	243:48
In this type in the last 30 days	02:12
In this type in the last 24 hours	00:00

N.B.: The data related to the flown hours were obtained through the records of the CIV and the pilot's statements. He also stated that he had around 300 hours on another model in the Extra family, which resulted in a total of over 500 hours of aerobatic flying experience.

1.5.2 Personnel training.

The pilot took the PPR course at the Campinas Aeroclub, in 2007.

His initial aerobatic flight training was carried out in the USA, at the Aerobatic Experience, based in the city of Saint Augustine - FL, in 2010. The training program included approximately 10 hours of flight.

1.5.3 Category of licenses and validity of certificates.

The pilot had the PCM License and had valid MNTE, INVA and IFRA Ratings.

His ACRO Rating was valid until April 2016. It is important to note that with the publication of Amendment No. 04 of the RBAC No. 61, on 17SEPT2014, the ANAC stopped renewing this type of Rating. However, such authorizations would remain valid until expiration, even if on a date after the publication of the referred Amendment.

1.5.4 Qualification and flight experience.

At the time of the accident, there were no qualification, rating, training, experience and proficiency verification requirements established by the ANAC for the practice of aerobatics.

1.5.5 Validity of medical certificate.

The pilot had valid CMA.

1.6 Aircraft information.

The aircraft, serial number LC019, was manufactured by Extra Flugzeugproduktions - und Vertriebs, Hünxe - Germany, in 2013 and was registered in the PRI category.

The CA was valid.

The airframe, engine and propeller logbook records were updated.

The last inspection of the aircraft, of the "50 hours" type, was carried out on 02AUG2017 by the maintenance organization Baburich *Manutenção de Aeronaves*, in Americana - SP, with 20 hours flown after the inspection.

The EA 300/LC was equipped with four fuel tanks: one central, one for aerobatic flight and one on each wing.

The wing tanks had a capacity of 60 liters each, totaling 120 liters. Considering the density of aviation gasoline of 0.72 kg/l, this volume was equivalent to 86.4 kg. The acrobatic flight tank held 9 liters (6.5 kg) and the central 60 liters (43 kg).

The Pilot's POH, common to the EA 300/LC and Extra 330LX models, stated, in its Section 2 - "Limitations", that the plane had been designed to perform any aerobatics, provided that the wing tanks were empty (Figure 3).

2.8.2 ACROBATIC FLIGHT

The plane is designed for unlimited aerobatics (wing tank must be empty). Inverted flight maneuvers are limited to max 4 min.

Figure 3 - Information about the acrobatic flight with the Extra 300/LC.
Source: POH Extra 300/LC.

The POH also established three categories of aircraft operation, as shown in Figure 4 below:

Pilot's Operating Handbook EXTRA 330LX		EXTRA				Section 5 Performance
5.4 STALL SPEED						
CONDITION: POWER IDLE FORWARD C/G		STALL SPEEDS ANGLE OF BANK				
WEIGHT	CATEGORY	0° 1 g	30° 1,15 g	45° 1,41 g	60° 2 g	
kg (lbs)		KTAS (km/h)	KTAS (km/h)	KTAS (km/h)	KTAS (km/h)	
950 (2095)	NORMAL/ACRO III	64 (119)	69 (128)	76 (141)	91 (169)	
870 (1918)	ACRO II	61 (113)	66 (122)	73 (135)	87 (161)	
820 (1808)	ACRO I	59 (109)	64 (119)	71 (131)	84 (156)	

Figure 4 - Operation categories foreseen for the EA 300/LC and Extra 330LX models.
Source: POH EA 300/LC.

In Figure 4 above, it can be seen that the Stall Velocity (V_s) in a curve with 60° of inclination was 91 kt in the NORMAL/ACRO III category and 84 kt in the ACRO I category, respectively.

The rotation speed was 68 kt and the green band on the speed indicator started at 64 kt, which corresponded to V_s with 0° of inclination in the NORMAL/ACRO III category.

The minimum speed foreseen to perform an aileron roll was 80 kt and for inverted flight a speed above V_s should be maintained.

The maximum crosswind component for takeoffs and landings was 15 kt.

1.7 Meteorological information.

Weather conditions were favorable for the visual flight.

The METAR of the Viracopos International Aerodrome (SBKP), Campinas - SP, 9 NM away from SDAM, had the following information:

METAR SBKP 121900Z 26005KT 9999 FEW040 FEW050TCU 35/12 Q1013

1.8 Aids to navigation.

Nil.

1.9 Communications.

The Aerodrome had no flight control or information service.

Communications were carried out using the 125,775 MHz frequency, the FCA stipulated for use in the locality.

1.10 Aerodrome information.

The Aerodrome was public, managed by the DAESP and operated under VFR, day and night.

The runway was made of asphalt, with 16/34 thresholds, dimensions of 1,200 x 30 m, with an elevation of 2,008 ft.

1.11 Flight recorders.

Neither required nor installed.

1.12 Wreckage and impact information.

During the inverted flight, the aircraft's vertical stabilizer/rudder touched the runway asphalt.

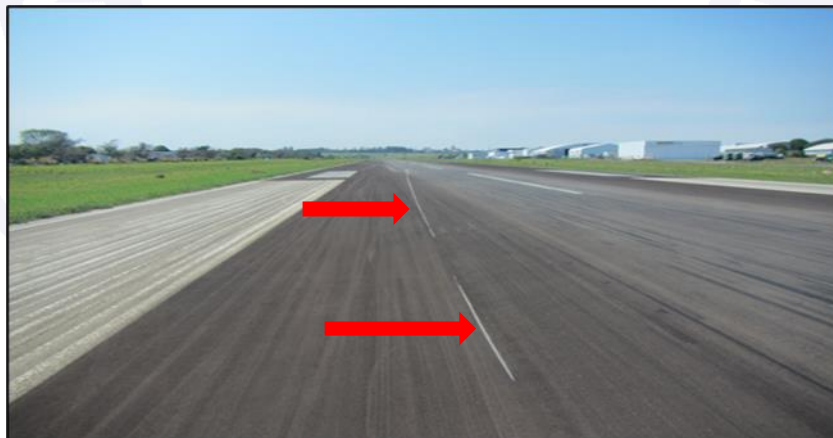


Figure 5 - Marks left by the vertical stabilizer/rudder contact with the runway.

After this first contact, the propeller collided with the ground.



Figure 6 - Marks left by the contact of the rudder, propeller, engine hood, spinner and right wing with the runway.

The plane dragged along the pavement, made a yaw left, overtook the runway's side limit, and stopped in the adjacent grassy area, still in the inverted position.

During this displacement, contact with the pavement caused damage to the propeller, which broke at the root; to the canopy; to the top of the engine hood; to the spinner and the tip of the right wing.



Figure 7 - Aircraft after a total stop.

The aircraft was removed from the scene, shortly after the occurrence, without coordination with the Investigation Authority of the SIPAER.

1.13 Medical and pathological information.

1.13.1 Medical aspects.

The pilot informed that, in the days before the accident, he used medication to minimize the effects of insomnia. He stated that he did not remember the name or active ingredient of this drug.

According to his report, he did not sleep well the night before and was very tired on the day of the accident.

The treatment of insomnia depends on knowing the cause, which can be behavioral or caused by previous predisposing conditions.

The use of medications for sleeping regulation should be seen as an auxiliary element in the treatment of insomnia. There are drugs that accelerate sleep and try to stabilize it, but there are other drugs that inhibit sleep.

In addition, medications used to treat psychological and psychiatric disorders and some antibiotics can influence sleep.

Insomnia medications, while shortening the time you wait for sleep, may not have lasting effects for the rest of the night. In addition, like other medications, they can have side effects, such as dependence, tolerance and blunting of attention and memory.

1.13.2 Ergonomic information.

Nil.

1.13.3 Psychological aspects.

The pilot's interest in aerobatic flights began in 2009.

To acquire knowledge and train skills in this area, he took the Upset Recovery course on the Extra 300L model, in Florida - USA.

According to his statement, after leasing the aircraft by the aviation school based in Americana - SP, he tried to accumulate flight hours training with the instructor who had flown the Extra EA 300 model the most in the world, in order to obtain a more complete mastery of the operation of this acrobatic model.

At the time of the accident, the pilot had more than 500 hours in aerobatic aircraft and had participated in several air shows and three aerobatics championships. He also acted as an instructor in theoretical and practical courses on recovery from abnormal attitudes and acrobatic flight.

Piloting was a hobby for the pilot. According to his report, on the day of the accident, his intention was to "clear his mind" and practice some acrobatic maneuvers.

At the beginning of the week in which the accident occurred, the pilot had performed the same flight profile that he planned to do on the day of the accident. On that occasion, he practiced some maneuvers that he planned to repeat on the flight in which this accident took place. He reported that he did not pay much attention to height and speed parameters in planning such maneuvers.

The pilot reported that he was going through a bad phase, with personal problems that were affecting his emotional state. The nights before the accident, he was unable to sleep and began self-medicating to minimize insomnia.

The pilot also declared that the aircraft did not present any abnormality.

There were reports from people who were at the airport at the time of the accident that they noticed him with a different behavior.

1.14 Fire.

There was no fire.

1.15 Survival aspects.

The pilot abandoned the aircraft on his own after coming to a complete stop.

1.16 Tests and research.

Nil.

1.17 Organizational and management information.

Nil.

1.18 Operational information.

It was a private flight, in which aerobatics training would be carried out.

According to what was informed to the investigators, the operation of the aircraft was conducted independently by a group of 3 aerobatics instructors. These pilots met with some frequency, discussed operational issues related to the activity and recorded the content of these discussions for consultation and archiving.

Aerobatic training flights were performed twice a week and lasted approximately 30 minutes. If a pilot did not fly for more than thirty days, he should perform a double command flight with one of the instructors of the mentioned group. If there were no problems, he would return to practice in solo flight.

On some flights, one of the aforementioned instructors observed the maneuvers performed from the ground and performed a debriefing with the pilot, after landing. In the case of flights in which there was no observer on the ground, the pilot himself recorded the information he deemed relevant in a specific form.

All the fuel tanks were practically full as they had been filled the day before in a nearby town.

After this refueling, the aircraft flew 10 minutes to Campinas and there was no consumption of the fuel stored in the wing tanks.

The pilot also stated that, for the flight that ended up in this accident, he forgot to check the amount of fuel in the tanks during the external inspection.

Based on the available data, it was calculated that the weight of the plane at the time of the accident was 859 kg (Basic Empty Weight = 660 kg + Wing Tanks = 86 kg + Center Tank and Acro = 43 kg + Pilot Weight = 70 kg).

Thus, the aircraft would be operated in the ACRO II category.

It was the first flight of the day, in which a sequence of maneuvers and acrobatics would be trained, as shown in the list in Figure 8.

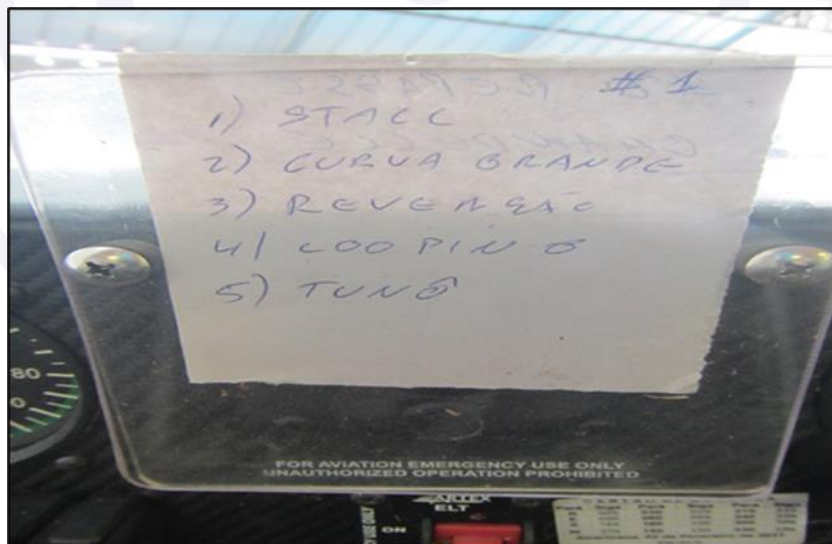


Figure 8 - Flight sequence fixed on the aircraft panel.

According to the pilot, he had already carried out flights with this sequence about ten times, with the purpose of training for “display” of aerial demonstration.

According to him, this sequence was under development, which is why not always only the planned maneuvers and stunts were performed.

The pilot stated that he decided to perform inverted flight training, at low altitude, after take-off, during the mental preparation before the flight and, for this reason, aerobatics was not included in the aid posted on the aircraft's panel.

He also reported that he had been training this maneuver for about a month and estimated that he had already performed it five times.

The pilot declared that he "rotated" the aircraft at the predicted speed of 68 kt and commanded the ailerons to rotate for inverted flight shortly afterwards. He stated that he used to perform this turn with a minimum speed of 100 kt. However, on this flight, it would have happened below the usual speed.

Also, according to the pilot, he normally started the turn for inverted flight at 100 ft after the take-off. Likewise, this parameter would not have been followed on the day of the accident and would have entered the back lower than usual; based on his judgment of distance from the ground, without consulting the altimeter.

Vertical stabilizer/rudder contact with the runway occurred shortly after the inverted flight condition was established.

1.19 Additional information.

The RBAC 67, in its Amendment 06, in force at the time of the occurrence, established, in section 61.25 - "Validity of the CMA", letter (a), number (1), the following limitation to the prerogatives inherent to licenses and ratings:

61.25 Validity of the CMA

(a) It is the license holder's responsibility to fail to exercise the prerogatives that his licenses and related qualifications grant him when:

(1) is aware of any impairment of his psycho-physical abilities that may prevent him from exercising the said duties in safety conditions;

1.20 Useful or effective investigation techniques.

Nil.

2. ANALYSIS.

It was a private flight, predominantly recreational, in which aerobatics training would be performed.

Considering the pilot's statement and the fact that the propeller blades had broken at the root, indicating that the engine was developing power at the moment of impact, it was verified that there was no failure of systems and/or components that could have affected the performance or the control of the aircraft.

It was found that the wing tanks were full of fuel, a fact that reduced the operating limits of the aircraft. Furthermore, based on the pilot's statement, the changeover to inverted flight was performed at a speed and height below those used in previous training.

Thus, the association of a high weight with a turn to the back position at a lower speed and height than those employed in this maneuver may have resulted in a greater sinking during or after its performance.

In this context, it was concluded that an inadequate assessment of the aircraft's response under such conditions, particularly in relation to the natural loss of lift due to the plane passing through high roll angles until reaching the back position, resulted in contact with the runway, which triggered the loss of control.

Considering the pilot's report that he was going through a bad phase, with personal problems that were affecting his emotional state and interfering with his rest to the point of

generating insomnia, it is possible that these personal life events produced conditions of fatigue and deviation from attention that may have negatively influenced his flight performance.

Such personal life events may have produced emotional states of anxiety, tension or stress, which could also negatively affect his flight performance.

In the same sense, considering the provisions contained in the RBAC 67 on the validity of the CMA, it was expected that the pilot would interrupt his air activities when noticing the degradation of his psychophysical skills, as a result of his state of insomnia and self-medication, and seek medical advice.

In view of the various possibilities of changes related to the use of drugs to combat insomnia and the fact that the pilot did not identify the substance he was using, it was not possible to rule out the possibility that this self-medication process was altering his cognitive and/or psychomotor ability.

The inadequate attention given to aspects related to the safety of the operation that would be carried out, such as forgetting to check the amount of fuel in the tanks, a limiting factor for the performance of aerobatics, as well as the passage to the inverted flight with parameters of height and speed below those assumed to be safe, demonstrated a reduction in the pilot's alertness regarding important issues for the safe conduct of the flight, which contributed to this accident.

Thus, considering the context of the occurrence, it is likely that the state of insomnia had a negative impact on the pilot's performance and contributed to this occurrence.

Thus, the research elements collected suggest that the pilot may have faced difficulties to perceive, analyze and respond adequately to the reactions of the aircraft during the execution of the aerobatics that resulted in this accident, due to the commitment in his decision-making process because of the possible decrease in his psychophysical aptitudes caused by insomnia and self-medication.

3. CONCLUSIONS.

3.1 Facts.

- a) the pilot had a valid CMA;
- b) the pilot had a valid MNTE Rating;
- c) at the time of the accident, there were no qualification, rating, training, experience and proficiency verification requirements established by the ANAC for the practice of aerobatics;
- d) the aircraft had a valid CA;
- e) the airframe, engine and propeller logbook records were updated;
- f) the weather conditions were favorable for the flight;
- g) the pilot informed that he was going through a bad phase, with personal problems that were affecting his emotional state and that in the nights before the accident he had difficulty sleeping;
- h) the pilot informed that, in the days before the accident, he used medication to minimize the effects of insomnia;
- i) the EA 300/LC POH stated, in its Section 2 - "Limitations", that the plane had been designed to perform any aerobatics, as long as the wing tanks were empty;
- j) the pilot declared that he forgot to check the supply of the tanks in the external inspection;

- k) all the plane's fuel tanks were practically full;
- l) the pilot informed that, after the take-off, he commanded the inverted flight with height and speed parameters below those assumed to be safe;
- m) during the inverted flight, the aircraft's vertical stabilizer/rudder touched the runway asphalt;
- n) after this first contact, the propeller collided with the ground and lost control;
- o) the plane dragged along the pavement, made a yaw to the left, crossed the side limit of the runway and stopped in the adjacent grassy area, still in the inverted position;
- p) the aircraft had substantial damage; and
- q) the pilot left unharmed.

3.2 Contributing factors.

- **Attention – a contributor.**

The inadequate attention devoted to aspects related to the safety of the operation that would be carried out, such as forgetting to check the amount of fuel in the tanks, a limiting factor for the performance of aerobatics, as well as the passage to the inverted flight with parameters of height and speed below those assumed to be safe, revealed a reduction in the pilot's attention to important issues for the safe conduct of the flight.

- **Emotional state – undetermined.**

The personal life events reported by the pilot had the potential to produce emotional states of anxiety, tension or stress, which could negatively affect his flight performance.

- **External influences – undetermined.**

Considering the pilot's report that he was going through a bad phase, with personal problems that were affecting his emotional state and interfering with his rest, to the point of causing insomnia, it is possible that these personal life events produced conditions of fatigue and attention deviation, which may have negatively influenced his flight performance.

- **Insomnia – undetermined.**

Considering the context of the occurrence, it is likely that the state of insomnia had a negative impact on the pilot's performance and contributed to this accident.

- **Piloting judgment – a contributor.**

Inadequate assessment of the aircraft's response under the conditions in which it was placed in an inverted flight, particularly in relation to height and speed parameters below those assumed to be safe, resulted in the runway contact that triggered the loss of control.

- **Decision-making process – undetermined.**

The research elements collected suggest that the pilot may have faced difficulties in perceiving, analyzing and acting properly in the face of all the variants related to the performance of the aerobatics that resulted in this accident, due to the commitment in his decision-making process.

- **Medicine intake – undetermined.**

The various possibilities of alterations related to the use of drugs to fight insomnia and the fact that the pilot did not identify the substance he was using did not allow us to rule out the possibility that self-medication was altering the pilot's cognitive and/or psychomotor capacity.

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-128/CENIPA/2017- 01

Issued on 05/27/2022

Disseminate the lessons learned from this investigation, so that pilots who perform acrobatic flights are alerted about the need to maintain their psychophysical skills at levels suitable for carrying out this activity, in view of the inherent risks of this type of operation.

5. CORRECTIVE OR PREVENTATIVE ACTION ALREADY TAKEN.

None.

On May 27th, 2022.