COMANDO DA AERONÁUTICA

CENTRO DE INVESTIGAÇÃO E PREVENÇÃO DE ACIDENTES AERONÁUTICOS

FINAL REPORT
A - 133/CENIPA/2017

OCCURRENCE:	**ACCIDENT**
AIRCRAFT:	**PT-ORU**
MODEL:	**210N**
DATE:	**22OCT2017**

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 22OCT2017 accident with the 210N aircraft, registration PT-ORU. The accident was classified as “[LALT] Low Altitude Operations”.

During an aerobatic performance over the Itaituba Aerodrome (SBIH) - PA, the aircraft crashed into the ground.

The aircraft was destroyed.

All five occupants suffered fatal injuries.

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

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GLOSSARY OF TECHNICAL TERMS AND ABBREVIATIONS

AIS	Aeronautical Information Service
ANAC	Brazil's National Civil Aviation Agency
ATS	Air Traffic Services
AVGAS	Aviation Gasoline
CA	Airworthiness Certificate
CENIPA	Aeronautical Accident Investigation and Prevention Center
CG	Center of Gravity
CINDACTA IV	Fourth Air Defense and Air Traffic Control Integrated Center
CMA	Aeronautical Medical Certificate
DECEA	Airspace Control Department
ICA	Aeronautics Command Instruction
IFR	Instrument Flight Rules
METAR	Meteorological Aerodrome Report
MNTE	Airplane Single Engine Land Rating
NM	Nautical Miles
NTSB	National Transportation Safety Board (USA)
PPR	Private Pilot License – Airplane
RBAC	Brazilian Civil Aviation Regulation
RBHA	Brazilian Aeronautical Certification Regulation
RDO-IH	Itaituba Radio
RCSV	Report to the CENIPA for Flight Safety
RELPREV	Prevention Report
RS	Safety Recommendation
SBIH	ICAO Location Designator – Itaituba Aerodrome - PA
SIPAER	Aeronautical Accident Investigation and Prevention System
TPP	Registration Category of Private Aircraft Service
UTC	Universal Time Coordinated
VRF	Visual Flight Rules

1. FACTUAL INFORMATION.

Aircraft	**Model:** 210N **Registration:** PT-ORU **Manufacturer:** Cessna Aircraft	**Operator:** *OM DIST. DE TIT. E VAL. MOBILIÁRIOS* LTD.
Occurrence	**Date/time:** 22OCT2017 - 2105 UTC **Location:** 45 St., Vitória Régia Neighborhood, Itaituba **Lat.** 04°14'40"S **Long.** 055°59'54"W **Municipality – State:** Itaituba – PA	**Type(s):** [LALT] Low Altitude Operations **Subtype(s):** NIL

1.1 History of the flight.

The aircraft took off from the Itaituba Aerodrome (SBIH) - PA, at 2101 (UTC) to conduct a local flight with one pilot and four passengers on board.

After the take-off, the aircraft made a low pass over one of the Aerodrome hangars, where an Aviator's Day celebration occurred.

Following the low pass, an acrobatic maneuver was performed, but the aircraft ended up colliding with the ground in a vegetation area near an urban road, about 350 meters from the side of the runway.

The aircraft was destroyed.

The pilot and four passengers suffered fatal injuries.

1.2 Injuries to persons.

Injuries	Crew	Passengers	Others
Fatal	1	4	-
Serious	-	-	-
Minor	-	-	-
None	-	-	-

1.3 Damage to the aircraft.

The aircraft was destroyed.

1.4 Other damage.

The engine of the aircraft hit the wall of a residence, causing damage.

1.5 Personnel information.

1.5.1 Crew's flight experience.

Hours Flown	Pilot
Total	2.000:00
Total in the last 30 days	80:00
Total in the last 24 hours	02:20
In this type of aircraft	1.000:00
In this type in the last 30 days	80:00
In this type in the last 24 hours	02:20

N.B.: The data related to the flown hours were obtained through third parties.

1.5.2 Personnel training.

It was not possible to identify the pilot training school.

1.5.3 Category of licenses and validity of certificates.

The pilot had the PPR License and had valid MNTE Rating.

1.5.4 Qualification and flight experience.

The pilot was qualified and had experience in the type of flight.

1.5.5 Validity of medical certificate.

The pilot had valid CMA.

1.6 Aircraft information.

The aircraft, serial number 21064864, was manufactured by Cessna Aircraft, in 1984 and it was registered in the TPP category.

The aircraft had valid Airworthiness Certificate (CA).

The airframe, engine and propeller logbooks records were outdated.

The last "100-hour" inspection of the aircraft was performed on 04OCT2017 by the Piquiatuba Air Taxi maintenance organization, in Santarém - PA, having flown 34 hours and 30 minutes after the inspection.

The last "200-hour" revision of the aircraft, with 1000-hour items, was performed on 01SEPT2017, by the CONAL maintenance organization, in Sorocaba - SP, having flown 135 hours and 50 minutes after the revision.

It was in the CA of the aircraft the category "Normal", therefore, it was not certified for acrobatic flights.

1.7 Meteorological information.

The conditions were favorable for the visual flight.

The Local Meteorological Bulletin (METAR) of the Itaituba Aerodrome (SBIH) had the following information:

SBIH 222100Z 11004KT 9999 FEW022 FEW028TCU 35/21 Q1007.

1.8 Aids to navigation.

Nil.

1.9 Communications.

Nil.

1.10 Aerodrome information.

The Aerodrome was public, administered by the city hall and with Aeronautical Information Service (AIS) provided by INFRAERO. It operated under VFR and instrument flight rules (IFR), both day and night.

The runway was made of asphalt, with thresholds 05/23, dimensions of 1,605m x 30m, with an elevation of 108 feet.

The Itaituba radio station provided the Aerodrome Information Service and the Alert Service to all traffic in operation in the movement area and to all aircraft in flight in the ATS class "G" airspace, below the FL145 and in a radius of 27 NM (50km) from the Itaituba Aerodrome - PA, by frequency 125,500 MHz.

The administration or INFRAERO did not report low altitude flights in the Aerodrome area.

1.11 Flight recorders.

Neither required nor installed.

1.12 Wreckage and impact information.

The impact occurred in a vegetation area next to an urban road, away about 350 meters from the side of the runway.

The wreckage distribution was linear, with the aircraft concentrated at the point of impact and the engine 10 meters ahead. This engine hit the wall of a residence, tearing it down.

The first impact occurred in a pitch down attitude (approximately 10°) against a terrain elevation, stopping 30 meters ahead at the end of a slope.

There was no fire.

1.13 Medical and pathological information.

1.13.1 Medical aspects.

The pilot presented the amount of 0.0215% ethyl alcohol in the blood, lower than the one foreseeing in the prohibitive range of the RBHA 91. Even so, alcohol levels between 0.01% and 0.05% can lead to impairments, such as decreased attention and vigilance, slower reflexes, poor coordination, and reduced ability to make rational or discerning decisions.

The material for analysis was collected from the thoracic cavity, approximately 3 hours after the accident, obeying the norms of RBHA 91.

There was, in the right seat, a passenger who was also a pilot and had a blood sample containing 0.0095% ethyl alcohol.

1.13.2 Ergonomic information.

Nil.

1.13.3 Psychological aspects.

The pilot involved in this event began his aviation activities in 2015 as a private pilot. At the same time, he started the services for the owner of the aircraft PT-ORU, but without formal employment bond.

According to the perception of people of his conviviality, the pilot was motivated and enthusiastic about aviation and showed interest in pursuing his career and progressing professionally in this area.

Due to his proficient and communicative profile, he had acquired the confidence of the operator. Being proficient in the English language, he contributed to the company's business activities.

According to the reports obtained during the investigation, he was considered a good professional, performing his work well, despite presenting apparent anxiety due to his youth.

Although he had good relations in his work environment, sometimes his behavior was daring and self-conscious, not being open to learning from the more experienced pilots.

From the operator's perspective, he was considered an eager and sometimes daring pilot, demonstrating excessive motivation. According to information obtained, the pilot had already performed acrobatic maneuvers and low-altitude passes.

One day before the occurrence, the pilot made a flight with a company representative of a gold mining region, where they stayed overnight. Although there were reports that the pilot was in the habit of drinking alcoholic drinks on social occasions, it was informed that, at that time, the pilot did not leave the hotel and did not drink alcohol.

On the day of the accident, the aircraft took off from this gold mining region to SBIH, at about 1430 (UTC). According to the perception of people who had contact with the pilot on the day, he showed anxiety to return, since it would participate in the celebrations of the Aviator's Day in that locality.

During the investigation, there were reports that the pilot was enthusiastic about maneuvers and aerobatics. However, according to the data reported, the company representative had not authorized the use of the aircraft for the event.

In the flight of the event, both the pilot and the passengers participated in the festival, which was traditionally held annually in the locality. This event was marked by several flights with low altitude passes and acrobatic maneuvers performed by pilots from the region.

All flights were recreational, having as purpose the air demonstration and / or the realization of panoramic flights with passengers, as was the case of the flight that originated the occurrence in question.

In these celebrations, it was customary to have a fraternization between the local aeronautical community, pilots, family and admirers, being allowed the consumption of alcoholic beverage. It was evidenced that some pilots made use of alcohol during the event, even before the air activity.

Several flights were also carried out near the Aerodrome, including low-pass and various other maneuvers.

According to the operator, the aircraft was being used that day without proper authorization. In addition, the pilot had consumed alcoholic beverages, taking flights despite such consumption.

1.14 Fire.

There was no fire.

1.15 Survival aspects.

There were no survivors.

1.16 Tests and research.

Although the airframe, engine and propeller logbooks records were outdated, there were no technical discrepancies that could have contributed to any malfunctioning of the systems during the flight.

In addition, maintenance was considered up-to-date and the engine was generating power at the time of collision.

1.17 Organizational and management information.

The operator had a representative in the city of Itaituba - PA, which was responsible for logistics and safety, as well as acting as the coordinator of the air activities in support of the company's inspections in places where it had branches.

In general, these flights were intended to carry passengers and cargo. They were performed by the pilot involved in the accident, about two to three times a week.

The pilot worked as a freelancer with the company for more than eighteen months. The service started by indication, shortly after his training as a private pilot, in order to give him an opportunity, so that he could acquire the practice of flying in the region.

This indication, as well as the activities carried out in the period, generated a relationship of confidence between the representative and the pilot. Thus, the free access of the pilot to the aircraft, which was parked in one of the Aerodrome hangars, was considered normal.

The selection and hiring of crew in the company did not follow a standardized procedure, besides not having a structured training sector.

According to the operator, only people authorized by the company could fly the aircraft, whether as a pilot or as a passenger. However, it stated that on the day of the occurrence, the aircraft was used without proper authorization.

1.18 Operational information.

It was not possible to establish whether the aircraft was within the weight and balance limits specified by the manufacturer.

The aircraft had been supplied the previous day with 150 liters of AVGAS 100. On the day of the occurrence, four local flights were performed in SBIH, all with the purpose of carrying out maneuvers and passes at low altitude.

Figure 1 - PT-ORU Low altitude pass on one of the flights preceding the accident.

On the fifth and last flight, a security camera recorded the moment of boarding on the PT-ORU. Thus, it was found that there were five people on board and no cargo on the aircraft.

Among the passengers, one of them was also a pilot and took the right seat, and his identification code with the National Civil Aviation Agency (ANAC) was used to notify the last two flights of the aircraft, including the accident one.

According to information, it was common to have another pilot aboard these commemorative flights, but only as a passenger. Thus, like the three passengers, this pilot had been invited to fly over the Aerodrome.

The take-off occurred at 2101 (UTC). However, about 4 minutes after takeoff, another security camera recorded the aircraft making a low altitude pass and performing a

rapid ascent. Soon after the aircraft appeared in recovery and colliding against the ground (Figure 2).

Figure 2 - Sketch of the accident, with the line of sight of the safety camera and approximate trajectory of the aircraft until the impact.

According to information, the aircraft would have performed an acrobatic maneuver (*tonneaux*), but this was not successful.

During the annual Aviator's Day celebration, several aircraft made flights over the locality, with irregular pass, acrobatic maneuvers and flights in formation with up to three aircraft being common.

It is worth remembering that there was no longer a requirement by the Regulatory Agency for the qualification of "Aerobatic Pilot".

Below, follow the information on the ANAC website

(http://www.anac.gov.br/assuntos/paginas-tematicas/aerodesporto/acrobacia-aerea):

> Aerobatics is the execution of intentional maneuvers involving sudden changes in altitude or acceleration of an aircraft other than normal flight. This sports modality aims at the individual's leisure of the practitioner and the demonstrations in air shows and championships.
>
> The ANAC does not issue specific qualification for aerobatics practice.
>
> Judgment about the proficiency of pilots and their ability to perform certain maneuvers is the responsibility of the Operations Director of the event or air show.
>
> In the case of demonstration events and air shows, the Operations Director will be responsible for ensuring that the aircraft used are appropriate to the type of maneuver intended and that the pilots are properly qualified to perform.
>
> The practice of aerobatics is restricted to designated flight spaces, so-called acrobatics boxes.
>
> The definition of areas for events or trainings is done by the Department of Airspace Control (click on the link to access the DECEA website) and depends on authorization, which must be requested by the practitioner himself.
>
> The commercialization of the air demonstration carried out by a specialized air service company in the demonstration mode is legal. Information regarding the request for events or air shows can be found in Supplementary Instruction 91.1001.
>
> Remunerated instruction for the continuity of the sport is also legal. The instructional activity is not regulated by the ANAC and occurs freely within the practicing community. Therefore, it is not possible for ANAC to guarantee the safety of people involved in acrobatic flight. The Agency recommends those interested in aerobatics to seek associations or training centers.

It should be noted that law prohibits the commercial exploitation of air activities without the authorization of the ANAC and that the Agency does not guarantee the safety of the people involved in the acrobatic activity.

Because it is a high-risk activity and practiced by specialized personnel, the ANAC limits itself to segregating the operation in a way that does not offer risks to people on the ground and to the civil aviation system.

1.19 Additional information.

The RBHA established the following in item 91.119 regarding minimum safety altitudes:

"Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

(a) anywhere. An altitude, which, in the event of failure of an engine, makes an emergency landing without undue risk to persons and surface properties.

(b) over densely populated area. Over any densely populated area of a city or any set of people outdoors, an altitude of 1000 feet (300 m) above the highest obstacle within a horizontal radius of 2000 feet (600 m) around the aircraft.

(c) over non-densely populated areas. An altitude of 500 feet (150 m) above surface, except over open water or sparsely populated areas. In such cases, the aircraft may not be operated less than 500 ft. (150 m) from any person, vessel, vehicle or structure. "

Section 23.3 of RBAC 23, Airworthiness Requirements, provided the following for this category of aircraft:

"(A) The normal category is limited to airplanes with a seating configuration of nine or fewer seats, excluding pilot seats, a certificated takeoff weight of 12,500 lb. (5,670 kg) or less and designed for non-acrobatic operation. Non-acrobatic operation includes:

(1) Any probable maneuver in normal flight;

(2) Stalls (except whip stalls); and

(3) Loopings, *chandelles* and sharp curves where the lateral tilt angle does not exceed sixty (60) degrees. "

Section 91.303 of RBHA 91 described the acrobatic flight as being:

"... any intentional maneuver involving sudden changes in aircraft attitude or attitudes and / or accelerations not required for normal flight."

ICA 100-12, Air Traffic Rules, contained, in its section 4.1.7, the following text regarding the authorization by the competent authority related to the ATS body:

"No aircraft shall perform acrobatic flights in areas which constitute a danger to air traffic, except in areas established for that purpose or authorized by the competent authority, in accordance with information, advice and / or authorization of the relevant ATS body."

Regarding the consumption of alcoholic beverage prior to the flight, Section 91.17 (a) of RBHA 91 said the following:

(a) No person may act or attempt to act as a crewmember of a civil aircraft:

(1) within 8 hours after consuming any alcoholic beverage;

(2) while under the influence of alcohol;

(4) while having in the blood a quantity equal to or greater than 0.04% (by weight) of alcohol.

The RBAC 153 provided, in Section 153.21 Responsibilities of the Aerodrome Operator, letter (a), number (11) as follows:

"(A) the Aerodrome operator shall be responsible for:

(11) communicate to ANAC any ESO[1] related to the Aerodrome, as established by the PSOE / ANAC and current regulations;

1.20 Useful or effective investigation techniques.

Nil.

2. ANALYSIS.

On the day of its occurrence, there was the celebration of Aviator's Day in the Aerodrome area, more precisely, in one of the hangars where the community met to fellowship and observe the flights that happened nearby.

This commemoration took place annually in the locality, having as main point the flights in which the pilots performed low-altitude passes, acrobatic maneuvers and even flights in formation.

During the investigation, it was verified that it was culture of the regional pilots' group to carry out these types of flight, including several videos and reports in this regard (Figures 3 and 4).

Figure 3 - Image of the Tapajoara TV with an aircraft passing about 10ft over the Tapajós River, in Itaituba - PA, on the Aviator's Day.

Figure 4 - Image of social medias in which an aircraft performs acrobatic maneuver in Itaituba - PA.

[1] Operational Safety Events (ESO) means accidents, serious incidents, incidents, ground incidents, abnormal occurrences or any hazardous situation that causes or has the potential to cause damage, injury or threat to the viability of the airport or air operation.

These flights were mainly performed in an irregular manner, since, in addition to the aircraft not being approved for acrobatic flight, the operating limits established in RBHA 91, as mentioned in item 1.19 - Additional information, were not respected.

It should be noted that, when flying under such conditions, the pilots participating in the event exposed themselves to unnecessary risks and for which there was no management measure. Such complacency demonstrated by that group of pilots corroborated for the accident, as it fostered attitudes of non-compliance with the procedures prevised in the legislation.

On the PT-ORU flights, on the day of the occurrence, the aircraft made low-passes at heights lower than the standards, with the last pass over the hangar about 40 feet from the ground.

The flight profile at low altitude, besides diverging from the current legislation, indicated a precarious decision making of the crewmember, with no adequate evaluation of the risks present in the operation.

After the low pass, the aircraft started a rapid ascent with a left turn, in which, according to reports and image analysis, it was stated that an acrobatic maneuver similar to a *tonneaux* was performed, but without success.

During the evolution, the aircraft approached the ground in an abnormal attitude and, due to the low altitude, it was not possible the recovery of the flight, denoting an inadequate application of the flight commands.

Considering that the Airworthiness Certificate of the aircraft was classified as "Normal", it was understood that this was designed for non-acrobatic operation.

Thus, the maneuver performed contradicted Section 23.3 of RBAC 23, Airworthiness Requirements, as described in item 1.19 - Additional Information.

According to data obtained, the aircraft's pilot had the bold, daring and enthusiastic profile. This profile, associated with the absence of formal processes to control and monitor air activities, increased the possibility of flights with extrapolation of the operation's limits.

These circumstances, coupled with a possible motivational increase, due to the celebrations of the Aviator's Day, led to a performance based on a precarious assessment of the risks arising from the maneuvers performed and the flight profile adopted.

In the context of the ATS body action, it was found that, although several flights that had been performed were disobeying the legislation, the RD-IH did not make any interference or even communicated the realization of flights at low altitude at the Aerodrome.

Likewise, it was verified that the constant determination of RBAC 153, regarding the communication of Operational Safety Events was not complied by the Aerodrome operator.

The ICA 100-12 Air Traffic Rules, in item 4.1.7, described the irregularity of the flight in question as to the authorization by the competent authority related to the ATS body, as described in Item 1.19 - Additional Information.

The competent authority for the locality was the CINDACTA IV, which did not receive any requests for acrobatic flights to the region.

It was evidenced that in the annual celebrations there was the consumption of alcoholic beverages on the part of the pilots, even by those that would be involved in the air activity.

In the present case, it was verified that the pilot consumed alcohol before the flight, in disagreement with what was recommended in Section 91.17 (a) of RBHA 91, as described in Item 1.19 - Additional Information.

Despite the alcoholic content presented, namely 0.0215%, leaving the pilot outside the prohibitive range of RBHA 91, even so, the level of alcohol between 0.01% and 0.05% can bring losses, such as the decrease of attention and vigilance, slower reflexes, difficulty in coordination, and reduced ability to make rational or discerning decisions.

In the on-screen accident, the pilot's failure to judge the maneuver performed may have been influenced by the reduction in his cognitive ability, induced by the presence of alcohol in the blood.

In the meantime, it was found that the passenger in the right seat, who was also a pilot, had a very low blood alcohol content. However, no evidence was found of this person's performance in the aircraft's flight commands.

On the other hand, analyzing the occurrence, it was verified that the PT-ORU aircraft, in addition to being up-to-date, had the engine generating power at the moment of collision. In this sense, there were no system, component or structural failures.

In spite of the impossibility of calculating the exact weight at the time of the occurrence, it was understood that the aircraft was within the limits of weight and center of gravity (CG) established by the manufacturer for a normal flight. This statement was based on the fact that the maximum number of occupants was not exceeded and there was no cargo and no luggage.

As for the operator, the lack of organizational processes for hiring and training crew favored the informality.

Thus, although an authorization to use the aircraft was required, this guidance was not sufficient to avoid misuse of the equipment.

Considering the presented conditions, the attitude of the pilot, characterized by the exhibitionism and excess of self-confidence, may have impaired the perception of critical elements for a safe flight.

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 and had experience in that kind of flight;

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

e) the airframe, engine and propeller logbooks records were outdated;

f) the weather conditions were favorable for the flight;

g) the pilot presented the amount of 0.0215% ethyl alcohol in the blood;

h) the aircraft performed four flights prior to the accident flight, in which low-pass flights were made;

i) on the fifth and last flight, the aircraft took off from SBIH at 2101 (UTC) with one pilot and four passengers;

j) without informing Radio Itaituba, the aircraft made a low crossing over a hangar where a celebration of the Aviator's Day occurred;

k) after the pass, the aircraft performed an acrobatic maneuver;

l) the aircraft crashed into the ground about 350 meters from the side runway;

m) the aircraft was not certified for acrobatic maneuvers;

n) the engine hit the wall of a residence, tearing it down;

o) the aircraft was destroyed; and

p) the occupants suffered fatal injuries.

3.2 Contributing factors.

- **Alcohol – undetermined.**

Despite being below the limit established in legislation, the presence of alcohol in the pilot's blood may have contributed to the accident by reducing attention and vigilance, as well as slowing reflexes and reducing the ability to discern.

- **Control skills – a contributor.**

During the performance of the acrobatic maneuver (*tonneaux*), there was an incorrect performance in the flight commands, causing the aircraft to take an aggressive attitude toward the ground.

- **Attention – undetermined.**

The exhibitionist's profile demonstrated, along with the possible effects of alcohol, may have reduced the ability to meet the levels of attention required for flight management.

- **Attitude – a contributor.**

The exhibitionist profile demonstrated during the flights carried out in the event, characterized by acrobatic maneuvers and low altitude pass, denoted a low adhesion to the norms and foreseen procedures, which favored the accident in question.

- **Work-group culture – a contributor.**

The common practice observed in some of the pilots participating in that event, especially in the execution of low altitude pass and acrobatic flights, denoted informal practices that fostered attitudes incompatible with the flight safety culture.

- **Flight indiscipline – a contributor.**

Failure to comply with the regulations regarding low altitude flights and the execution of aerobatic maneuvers in an aircraft which has not been certified for that, has contributed to the outcome of the occurrence.

- **Piloting judgment – a contributor.**

The pilot incorrectly assessed his ability and capability of the aircraft to perform the acrobatic maneuver.

- **Motivation – undetermined.**

It is possible that the level of motivation of the pilot had risen, due to the celebrations allusive to the Aviator's Day, since it is a common event in the local aeronautical community, in which air demonstration flights were traditionally performed.

- **Perception – undetermined.**

The pilot's self-confidence attitude, along with exhibitionism, may have hindered the perception of critical elements for a safe flight. It is also emphasized that the use of alcohol

may have affected its ability to properly capture and process the information needed to manage the flight.

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

The performance of acrobatic maneuvers and the adoption of a low altitude flight profile were based on an erroneous evaluation of the operational context and the risks involved in that flight profile.

- **Organizational processes – undetermined.**

The failures related to the management by the organization, due to the absence of formal processes to control and monitor air activities may have favored the occurrence of this flight, whose operational profile was contrary to norms and procedures.

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-133/CENIPA/2017 - 01 **Issued on 05/16/2019**

Act with the operator of the Itaituba Aerodrome - PA, in order to make that body to observe the responsibilities related to its activity, especially regarding the communication to ANAC on Operational Safety Events (ESO) related to the Aerodrome, according to the Brazilian Regulation of Civil Aviation nº 153.

A-133/CENIPA/2017 - 02 **Issued on 05/16/2019**

Act with the operator of the Itaituba Aerodrome - PA, in order to ensure that prevention actions are encouraged, such as the preparation of Prevention Reports (RELPREV) and report to the CENIPA for the Flight Safety (RCSV), whenever situations are observed which put safety at risk.

A-133/CENIPA/2017 - 03 **Issued on 05/16/2019**

Evaluate the feasibility of modifying RBHA 91.17 (a) (4), in order to restrict the blood alcohol content for those who act or try to act as a civil aircraft crew from 0.04% to 0.00%, according to the transit legislation in force in Brazil.

To the Airspace Control Department (DECEA):

A-133/CENIPA/2017 - 04 **Issued on 05/16/2019**

Act with the Aerodrome Information Service Provider of Itaituba - PA, in order to ensure that preventive actions are encouraged, such as the preparation of RELPREV (Prevention

Reports) and RCSV (Report to the CENIPA for Flight Safety), whenever there are situations that put safety at risk.

5. CORRECTIVE OR PREVENTATIVE ACTION ALREADY TAKEN.

None.

On May 16th, 2019.