COMANDO DA AERONÁUTICA

CENTRO DE INVESTIGAÇÃO E PREVENÇÃO DE ACIDENTES AERONÁUTICOS

FINAL REPORT
A - 028/CENIPA/2017

OCCURRENCE:	**ACCIDENT**
AIRCRAFT:	**PR-MER**
MODEL:	**BO-105S**
DATE:	**16FEB2017**

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 16FEB2017 accident with the BO-105S aircraft, registration PR-MER. The accident was classified as “[F-NI] Fire/Smoke (Non-Impact) – Fire on the Ground”.

During the flight, the pilot smelled burnt, deciding to make a landing for verification.

After landing, the pilot observed a large amount of smoke in the rear of the helicopter and directed the passenger to abandon it.

The aircraft was destroyed.

The pilot and passenger left unharmed.

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

CONTENTS

GLOSSARY OF TECHNICAL TERMS AND ABBREVIATIONS

ANAC	Brazil's National Civil Aviation Agency
ASO	Occupational Health Certificate
BFU	*Bundesstelle für Flugunfalluntersuchung*
CA	Airworthiness Certificate
CENIPA	Aeronautical Accident Investigation and Prevention Center
CG	Center of Gravity
CM	Registration Certificate
CMA	Aeronautical Medical Certificate
COM	Maintenance Organization Certificate
CRM	Corporate Resource Management
CTM	Technical Maintenance Control
EO	Operating Specifications
HMTL	Helicopter Multi-Engine Rating
IFR	Instrument Flight Rules
INVH	Flight Instructor Rating - Helicopter
IS	Supplementary Instruction
MGSO	Safety Management Manual
PCH	Commercial Pilot License – Helicopter
PPH	Private Pilot License – Helicopter
PPSP	Program for the Prevention of Risk Associated with the Misuse of Psychoactive Substances in Civil Aviation
RBAC	Brazilian Civil Aviation Regulation
RBHA	Brazilian Aeronautical Certification Regulation
SNDC	ICAO Locator Designator – Redenção Aerodrome - PA
SNFX	ICAO Locator Designator - São Félix do Xingu Aerodrome -PA
SERIPA I	First Regional Aeronautical Accident Investigation and Prevention Service
SIPAER	Aeronautical Accident Investigation and Prevention System
TBO	Time Between Overhaul
TPX	Aircraft Registration Category of Non-Regular Public Air Transport
UTC	Universal Time Coordinated
VFR	Visual Flight Rules

1. FACTUAL INFORMATION.

Aircraft	**Model:** BO-105S **Registration:** PR-MER **Manufacturer:** Eurocopter Deutschland	**Operator:** Heringer Air Taxi Ltd.
Occurrence	**Date/time:** 16FEB2017 – 1500 UTC **Location:** Outside the Aerodrome **Lat.** 07°05'12"S **Long.** 052°23'20"W **Municipality – State:** São Félix do Xingu – PA	**Type(s):** [F-NI] Fire/Smoke (Non-Impact) **Subtype(s):** Fire on the Ground

1.1 History of the flight.

The aircraft took off from the São Felix do Xingu Aerodrome (SNFX) - PA, to the Pykany Village, located in the municipality of Altamira - PA, at about 1445 (UTC), in order to transport personnel, with a pilot and a passenger on board.

With about fifteen minutes of flight, the pilot noticed a smell of burning and, after turning off the non-essential electrical equipment, decided to make a precautionary landing in an open area about 66km away from SNFX.

After landing, the pilot noticed a large amount of smoke coming out of the rear of the aircraft and directed the passenger for immediate evacuation.

During the abandonment, the pilot did not cut the engines. After a few moments, a fire started.

The aircraft was destroyed.

The pilot and the passenger left unharmed.

Figure 1 - Aircraft after being consumed by fire.

1.2 Injuries to persons.

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

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.

Hours Flown	Pilot
Total	505:32
Total in the last 30 days	32:35
Total in the last 24 hours	00:15
In this type of aircraft	114:06
In this type in the last 30 days	32:35
In this type in the last 24 hours	00:15

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

1.5.2 Personnel training.

The pilot took the PPH course at the Rio Grande do Sul Aeroclube – RS, in 2012.

1.5.3 Category of licenses and validity of certificates.

The pilot had the PCH License and had valid BO-105S aircraft and HMLT Rating.

1.5.4 Qualification and flight experience.

The pilot was qualified and had experience in that kind of flight.

1.5.5 Validity of medical certificate.

The pilot had valid CMA.

1.6 Aircraft information.

The aircraft, serial number S-916, was manufactured by Eurocopter Deutschland, in 1996 and was registered in the TPX category.

The aircraft had valid Airworthiness Certificate (CA).

The engines logbooks were outdated, as they did not present the overhaul of the starter-generators.

The last inspection of the aircraft, the "25 hours" type, was performed on 09FEB2017 by the Heringer Air Taxi Ltd., in Redenção – PA, having flown 1 hour and 40 minutes after the inspection (Figure 2).

Although the signature for the components checked by Time Between Overhaul (TBO) was recorded on the inspection form, it was found that, on the occasion of this inspection, the starter-generators for the left engine and the right engine were approximately with 650 hours beyond the prevised for overhaul, according to the Component Log Card.

AIRBUS HELICOPTERS

MAINTENANCE MANUAL BO 105

101 - 5 SUPPLEMENTARY CHECK 25/50 FH

101 - 5.1 Supplementary Check 25/50 Fh Basic-Helicopter

101 - 5.1.1 Supplementary Check 25 Fh Basic-Helicopter

Registration No.: PR-MER H/C Serial No.: 5-916 Total Hours: 5155.2 Fh

Inspection or Maintenance Work	Reference	Initial
GENERAL		
(1) Review aircraft log book and ensure all recorded discrepancies have been corrected		
(2) Ensure compliance with all applicable airworthiness directives and manufacturer's (ECD) directives		
(3) Ensure compliance with all supplementary inspections and special inspections		
(4) Ensure life-limited parts do not exceed service life		
(5) Ensure TBO-components do not exceed TBO		
(6) Ensure all required inspections of engines, equipment and components have been performed according to respective manufacturer's documentation		
(7) Record compliance with these inspections in Historical Record		
11 - MAIN TRANSMISSION		
(1) Deleted		
41 - MAIN ROTOR CONTROLS		
(1) Deleted		
63 - LUBRICATION SYSTEM		
(1) EFFECTIVITY Ram air ventilation not installed. Visually inspect baffle plate, located between oil cooler and fan, and attaching clamps for cracks.		

Table 101-5.1 - Supplementary Check 25 Fh Basic-Helicopter (1 of 1)

Technician	Date:	Inspector	Date:
Name	Signature	Stamp	Signature

Revision 28

CHAPTER 101 Page 33

Figure 2 - 25 hour inspection form.

The last overhaul of the aircraft, the “3.000-hour” type was performed on 20MAY2016 by the Heringer Air Taxi Ltd. shop in Imperatriz - MA, having flown 122 hours and 40 minutes after the revision.

1.7 Meteorological information.

The conditions were favorable for the visual flight.

1.8 Aids to navigation.

Nil.

1.9 Communications.

According to the pilot, a radio contact was made with another helicopter that was nearby, transmitting its coordinates, at the time of the precautionary landing.

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.

There was no indication that the aircraft made any abnormal contact with the ground. After landing, the aircraft caught fire and the wreckage got concentrated.

1.13 Medical and pathological information.

1.13.1 Medical aspects.

There was no evidence that physiological or incapacitation considerations affected the performance of the crewmember.

The influence of psychoactive substances was also discarded, due to the examination carried out by the pilot after the occurrence, in which he had a negative result.

1.13.2 Ergonomic information.

Nil.

1.13.3 Psychological aspects.

The pilot involved in this event began his aviation activities in 2012, having obtained the Flight Instructor Rating - Helicopter (INVH).

At the invitation of one of his former students, who was the owner of the company, Heringer Air Taxi hired the pilot in 2016. The formal contract was to work in Itaituba - PA, outside the company's base.

The pilot was staying in hotels during the work period, since he did not have a residence in Itaituba - PA. On average, he performed four to five flight hours per month, most of which were flights for the purpose of serving the indigenous population.

According to his account, he considered himself to be a calm, patient and optimistic person. He said he could easily listen to others. He described himself as organized, committed and responsible at work. He always questioned when something was "non-standard".

The employer and co-workers considered him as a communicative and affable pilot in the interpersonal relationship. He was also described as a balanced and interested professional in aircraft studies. They considered him capable as a result of his experience as a pilot and helicopter instructor.

The flight that originated the occurrence had the objective of transporting some passengers. The pilot, being routinely the accomplishment of this type of flight, knew the region. However, it should be noted that it would be his first trip to that village.

In addition to the pilot, there was a passenger on board who served as an aid to boarding operations.

The pilot reported that, when flying over the forest, he felt a smell of burning and, upon checking the instruments, he did not observe any abnormal indication on the panel. He chose to carry out a precautionary landing, in order to verify the origin of the odor.

According to his account, he tried to keep calm to manage the emergency, relying on the procedures of the manual and the knowledge acquired in the instructions and in emergency trainings performed.

When the door was opened, the pilot noticed that there was smoke on the right rear of the aircraft. He determined the evacuation of the passenger to a safe place.

According to his report, he was concerned with ensuring the passenger's physical integrity and avoiding material damage.

Then the pilot also left the aircraft, but he did not cut the engines. As the fire quickly spread, he was forced to move away from the aircraft, fearing the risk of explosion.

1.14 Fire.

According to the pilot's statements, after the landing, a great amount of smoke was verified coming from the rear part of the aircraft, causing its occupants to perform the evacuation.

After abandonment, at a safe distance, the occupants considered returning and using the manual fire extinguisher, but the fire had already started in the engine compartment on the right side of the aircraft.

The fire was intense due to the existence of 440 liters of fuel remaining and to the material of the aircraft itself.

The fire consumed much of the aircraft, leaving only part of the vertical empennage and the tail rotor.

The origin of the fire could not be identified.

1.15 Survival aspects.

Nil.

1.16 Tests and research.

It was not possible to make an analysis of the equipment, due to the degree of destruction.

1.17 Organizational and management information.

The company Heringer Air Taxi Ltd. was over 35 years old and operated in accordance with the regulations required by the National Civil Aviation Agency (ANAC).

The company's main base of operations was at Imperatriz Airport - MA, and it was authorized to conduct the transportation of passengers, cargo and air ambulance services.

According to the Operational Specifications (EO), the fleet consisted of 22 aircraft, of which 17 were airplanes (Beechcraft 99 and 200, Cessna T-206, 550, 310Q and 310R) and 05 helicopters, model BO-105S, with the occurrence one included.

The maintenance of the helicopters was carried out by Heringer Air Taxi Ltd., according to the Maintenance Organization Certificate (COM) nº 8805-03 / ANAC.

The largest inspections were carried out at the company's base, but it was also authorized to perform such tasks in Itaituba - PA, with prior request and authorization from ANAC in other locations.

The company had a structured training sector and an initial training program, as provided in Supplementary Instruction (IS) 135-003A.

The crew consisted of 25 pilots total, 23 of them with the commander's function and two with the copilot's function.

The company also had two engineers and nine mechanics.

It was verified that the company had a Maintenance Technical Control (CTM) with two employees.

For the recruitment of new crewmembers, the company had the procedures set forth in the General Operations Manual (MGO), as required by Section 135.242 of the RBAC 135.

The personal selection of pilots occurred through initial recruitment in the market, and an interview was conducted to evaluate the profile and skills that these professionals possessed related to the flight pattern.

During this process, the pilots were submitted to the PPSP, the examinations to obtain the Occupational Health Certificate (ASO) and to the documentation analysis.

The initial training (ten days) and the periodic (annual) training were performed, as well as the biennial qualification of complementary disciplines of the Corporate Resource Management (CRM) and Dangerous Goods. There was control in the company regarding the validity of the crew's training.

According to the information obtained, the operational processes established by the organization determined the pre-flight and post-flight inspection by the pilot and the mechanic.

The use of checklists in operations was also encouraged, however, it was found that procedures divergent from those established by operation manuals were also accepted. This fact could be observed in relation to the disembarkation of the aircraft without cutting off the engines.

It was reported by the pilot that the landing with the engines still in operation occurred in order to prioritize the passenger's safety. According to the perception of some members of the organization, although this procedure is not provided in a manual, it may eventually be executed, according to the judgment of the pilot.

In relation to the local flight segment, the trainings were in compliance with the curricula foreseen in the Operational Training Program (PTO) in force at the company at the time of the accident.

The pilot of the occurrence went through all phases of the initial training, having performed the practical part of the flight curriculum in an aircraft of the same model of PR-MER. This training, which was for newly hired pilots, was completed in November 2016.

In the flight training records, as well as in the records of the maneuvers described in the PTO for local and route flight, it was observed that there were no references to fire / smoke emergency procedures.

This condition was only evaluated in the proficiency check performed by ANAC, which included the item fire in the engine. In this item, the pilot obtained a satisfactory degree.

1.18 Operational information.

The aircraft was staying overnight in the city of Redenção - PA, when it was called to carry out a passenger service that was in the Pykany Village, located in the municipality of Altamira - PA. At about 1200 UTC, the aircraft took off with a pilot and a passenger from Redenção Aerodrome (SNDC) to the São Félix do Xingu Aerodrome (SNFX). On this route, the pilot did not report anything unusual.

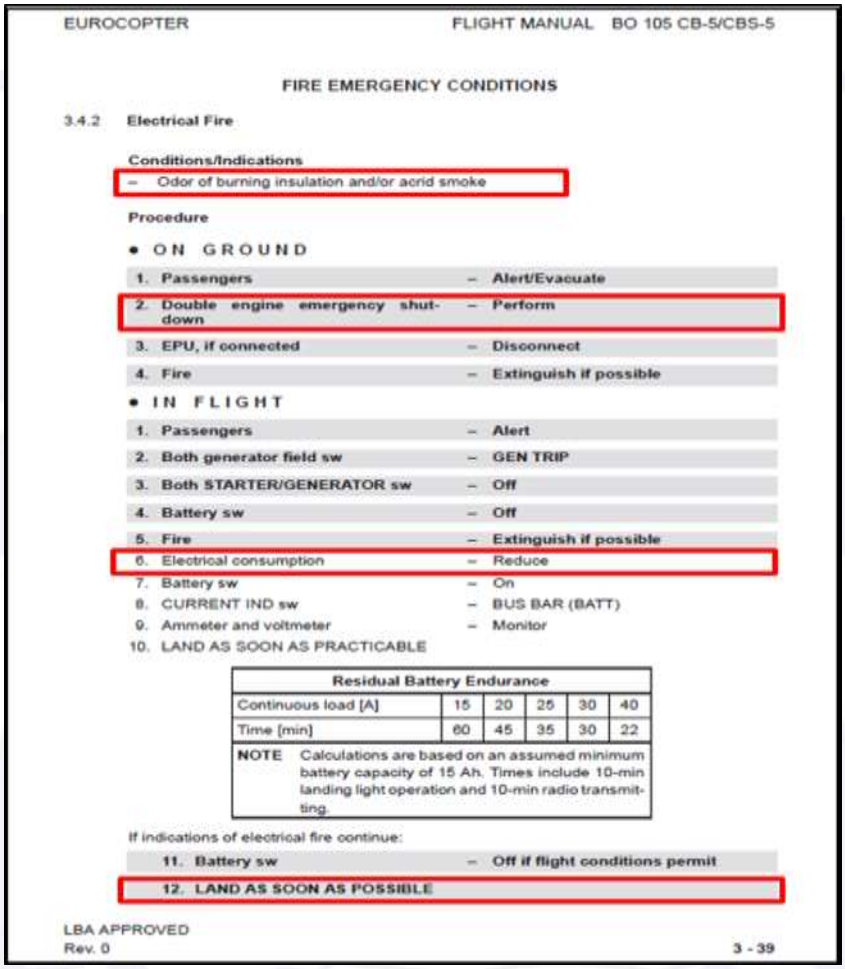
In SNFX, according to the receipt provided by the company Juliany Avgas, the aircraft refueled 440 liters of aviation kerosene (QAV-1), taking off at 1445 (UTC) to the Pykany Village without a flight plan.

The company responsible for the fuel supplied was authorized by the National Petroleum Agency (ANP) to resell aviation fuel in accordance with the Union Official Journal, from 30OCT2015.

The cargo manifest for the aircraft was not found, but considering the fuel on board and the two occupants, it is estimated that it was within the limits prescribed by the manufacturer.

After about 15 minutes of flight, the pilot noticed a smell of burning on board, but he had no indication or warning of fire or failure of any other component or system of the aircraft.

The pilot turned off non-essential electrical equipment, as described in the aircraft's flight manual for the "electric fire" emergency (Figure 3).



EUROCOPTER FLIGHT MANUAL BO 105 CB-5/CBS-5

FIRE EMERGENCY CONDITIONS

3.4.2 Electrical Fire

Conditions/Indications

– Odor of burning insulation and/or acrid smoke

Procedure

• ON GROUND

1. Passengers	–	Alert/Evacuate
2. Double engine emergency shut-down	–	Perform
3. EPU, if connected	–	Disconnect
4. Fire	–	Extinguish if possible

• IN FLIGHT

1. Passengers	–	Alert
2. Both generator field sw	–	GEN TRIP
3. Both STARTER/GENERATOR sw	–	Off
4. Battery sw	–	Off
5. Fire	–	Extinguish if possible
6. Electrical consumption	–	Reduce
7. Battery sw	–	On
8. CURRENT IND sw	–	BUS BAR (BATT)
9. Ammeter and voltmeter	–	Monitor
10. LAND AS SOON AS PRACTICABLE		

Residual Battery Endurance					
Continuous load [A]	15	20	25	30	40
Time [min]	60	45	35	30	22

NOTE Calculations are based on an assumed minimum battery capacity of 15 Ah. Times include 10-min landing light operation and 10-min radio transmitting.

If indications of electrical fire continue:

11. Battery sw	–	Off if flight conditions permit
12. LAND AS SOON AS POSSIBLE		

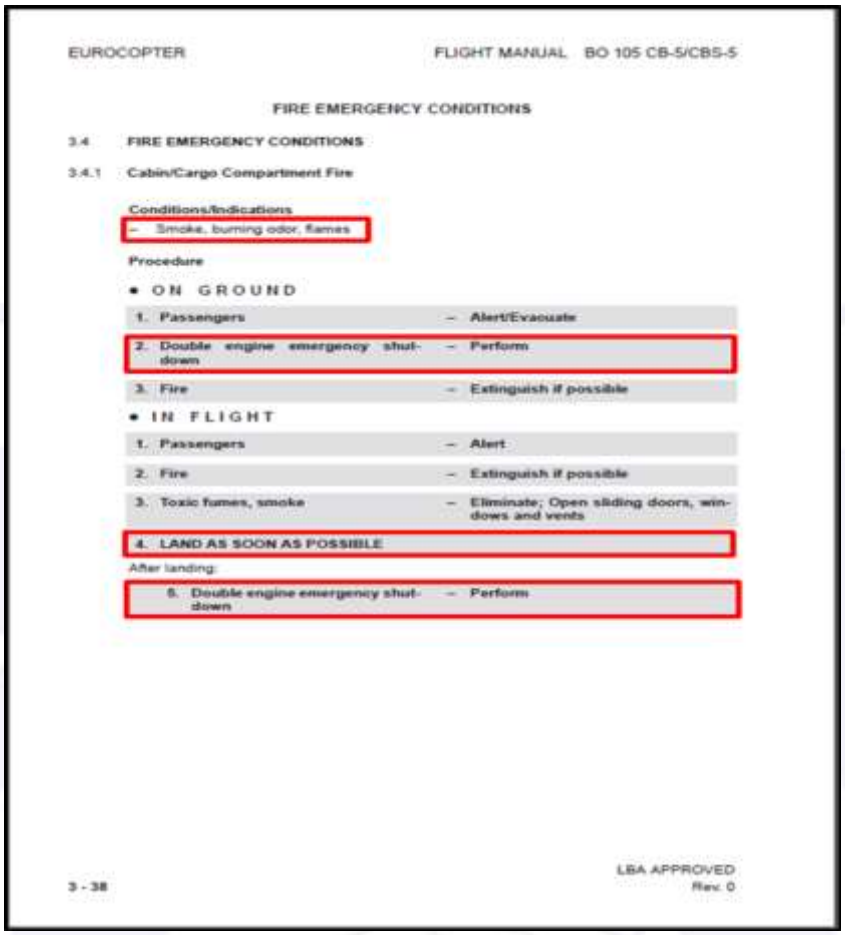
LBA APPROVED
Rev. 0 3 - 39

Figure 3 - Emergency Procedure for electrical fire.

Due to the smell of burning, the pilot decided to make a precautionary landing in an open area. The landing took place in a controlled way, fact evidenced by the team of investigators in the place of the occurrence, since there were no marks of abnormal contact with the ground.

According to the pilot, after landing, he noticed a large amount of smoke coming out of the rear of the aircraft and asked the passenger to evacuate. Upon leaving the passenger, the pilot stopped the collective and disembarked without cutting off the engines.

According to the flight manual, the procedure for smoke on the ground, both for electric origin (Figure 3) and non-electric (Figure 4), contemplated the emergency cutting off the two engines.



EUROCOPTER FLIGHT MANUAL BO 105 CB-5/CBS-5

FIRE EMERGENCY CONDITIONS

3.4 FIRE EMERGENCY CONDITIONS

3.4.1 Cabin/Cargo Compartment Fire

Conditions/Indications

– Smoke, burning odor, flames

Procedure

• ON GROUND

1. Passengers	–	Alert/Evacuate
2. Double engine emergency shut-down	–	Perform
3. Fire	–	Extinguish if possible

• IN FLIGHT

1. Passengers	–	Alert
2. Fire	–	Extinguish if possible
3. Toxic fumes, smoke	–	Eliminate; Open sliding doors, windows and vents
4. LAND AS SOON AS POSSIBLE		

After landing:

5. Double engine emergency shut-down	–	Perform

3 - 38 LBA APPROVED Rev. 0

Figure 4 - Emergency Procedure for Fire.

When he left, the pilot tried to return to use the hand fire extinguisher inside the aircraft, but the fire started on the right side of the engine compartment, becoming more intense due to the large amount of fuel remaining and the material of the aircraft itself.

1.19 Additional information.

Supplementary Instruction (IS 43.9-003), Revision A, issued by the National Civil Aviation Agency (ANAC), provided guidance on procedures for making, using and filing the airframe, engine and propeller logbooks of the Brazilian civil aircraft.

These logbooks were the books intended for the primary and secondary records of maintenance services performed on the aircraft and its components.

The logbooks were intended to centralize maintenance records and any technical records that evidenced the actual airworthiness conditions of the aircraft, engines, propellers and their components, in order to comply with the requirements set forth in the Brazilian Civil Aviation Regulation (RBAC) and in the Brazilian Aeronautical Certification Regulation (RBHA).

1.20 Useful or effective investigation techniques.

Nil.

2. ANALYSIS.

It was a personnel transport flight.

The aircraft did not have the maintenance records updated as provided in the manufacturer's manual. This condition was evidenced in the control map of components

and in the records presented by the company, which included the left and right start-generators with their overdue revisions.

Despite the expiration, there was no report by the pilot of abnormal functioning of these components. Also it was not possible to make an analysis of the equipment, due to the degree of destruction.

At the time of this occurrence, there were two CTM employees responsible for all aircraft. Due to the large number of aircraft models in the company, these employees may have been subjected to a labor overload, affecting their performance.

This condition may have contributed to failures in the management of the PR-MER aircraft, denoting a fragility in the control of its components, as evidenced by expired items that had not been detected by the company.

Analyzing the last 25 hours inspection performed on the aircraft, a failure in the supervision of the services was verified, since the inspection form included the verification signature of the components controlled by Time Between Overhaul (TBO) and, at the time of the inspection, the starter-generators had already exceeded the TBO limit.

According to the pilot's statements, no aircraft limits, indicated by its various alarm systems and warnings, have been exceeded. This condition, coupled with observations of the aircraft wreckage, refers to the normal operation of the engines.

The strong smell of burning was the only indicator that there was a problem with the flight, which alerted the pilot. Based on the absence of indications, in the smoke-emitting compartment and in the pilot's report, it is understood that the origin of the odor was in non-electric material, which would require the actions described in the checklist for such a situation, that is, landing as soon as possible and emergency cutting off the engines after landing.

When considering the procedures performed, namely, disconnection of electrical equipment not essential to the flight, it is possible that the pilot did not have the correct perception regarding the origin of the odor and, consequently, of the risks involved in those circumstances.

It is worth noting that, according to information, the pilot did not use the checklist to assist him, based only on the knowledge he had about the procedures provided in the aircraft manual. Such knowledge was based essentially on his training in the company.

The company had a training sector that followed the provisions of ANAC regulations. It kept all the records relative to the pilots had an adequate infrastructure, used modern means and evaluation sheets for each phase of training.

However, although the pilot had full initial training authorized by the ANAC, the initial training form of the local flight segment did not include fire / smoke procedures in the aircraft.

Also in this context, it was verified that the pilot performed a check flight by the Civil Aviation Authority, however, likewise, the fire / smoke procedures in the aircraft were also not considered, and only the item fire in the engine was evaluated.

The lack of these training items, which were predicted in the aircraft's flight manual, may have caused a failure in the learning process, making the pilot's adaptation to this procedure impossible. In this context, by failing to carry out the planned procedure, there was fire spreading, which aggravated the consequences of the accident.

It is also emphasized that emergency trainings, besides the development of technical skills, condition the psychomotor and emotional responses necessary to the management of critical situations in flight.

It is possible, therefore, that the pilot has not had the opportunity to condition his reactions to the point of acting in a standardized and efficient way in emergency management.

Considering what was recommended in the aircraft checklist, both for burning odor conditions from electric and non-electric material, this type of event would require a landing as soon as possible, that is, an emergency landing rather than a precautionary landing.

This condition was associated with the requirement for double engine emergency shutdown as described in the flight manual on pages 3-38 and 3-39.

Having carried out the precautionary landing, the pilot noticed a large amount of smoke coming out of the rear of the aircraft and, according to him, he locked the collective and coordinated the evacuation, but he did not cut off the engines.

The abandonment of the pilot from his command post with the engines running presented itself as an unforeseen and unusual fact in aviation.

According to the survey, in the organizational context of the company, a pilot evacuating the helicopter without cutting off the engines could be acceptable on certain occasions, even if he was operating in the single pilot condition.

Thus, although the aircraft operating manual defined as a standard procedure the engine cut-off before leaving the aircraft, it was found that there was a collective acceptance in the company of the procedures that diverged from those predicted, based on the subjective evaluation of each pilot.

This fact denoted vulnerabilities in relation to the flight safety culture, since it allowed the adoption of informal practices to the detriment of the standardization of air operations.

The weakening of the organizational culture, in relation to promoting the standardization of aircraft operation, coupled with the precarious approach of the fire / smoke emergency in the aircraft during the training, may have compromised the pilot's decision-making process in critical circumstances.

It was not possible to verify the origin of the fire nor to attribute it to a failure of equipment or deficiency of maintenance procedures, because all the related components had damages that prevented conclusive analyzes.

When leaving the aircraft with the engines running, an inadequate management of the situation was evidenced, reducing the safety margins of the operation.

In this way, the abandonment of the aircraft without cutting off the engines contributed to the worsening of the occurrence results, since it facilitated the fire to spread.

3. CONCLUSIONS.

3.1 Facts.

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

b) the pilot had valid type and HMLT Ratings;

c) the pilot was qualified and had experience in that kind of flight;

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

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

f) the engines logbook records were outdated;

g) the starter-generators overhauls were overdue;

h) the meteorological conditions were favorable for the flight;

i) the pilot felt a smell of burning in the cabin;

j) the aircraft has landed in a controlled way;

k) after landing the pilot observed smoke coming from the right rear part of the aircraft;

l) the pilot directed the passenger's disembarkation;

m) the pilot did not cut off the engines before leaving the aircraft;

n) the aircraft was destroyed; and

o) the pilot and the passenger left unharmed.

3.2 Contributing factors.

- **Training – undetermined.**

The training received by the pilot did not include the fire / smoke procedure on the aircraft, thus, it did not provide the adequate and necessary conditions to sediment the knowledge, which may have favored the adoption of practices divergent from the procedure.

- **Organizational culture – undetermined.**

In the organizational context, there was a collective acceptance of informal practices divergent from the manual, such as abandonment of the aircraft without the engine shutdown. This shared culture among the members of the organization may have fostered the non-standard performance of the pilot and favored the aggravation of the accident consequences.

- **Piloting judgment – a contributor.**

There was an inadequate assessment of the emergency as a whole, so that instead of making an emergency landing with engine cut-off after touching the ground, as provided in the flight manual, a precautionary landing was performed to check the conditions of the aircraft.

- **Perception – undetermined.**

It is possible that an erroneous perception about the origin of the burning odor has led to the adoption of emergency procedures divergent from those adapted to the situation experienced in that flight, implying a low level of situational awareness of the present risks.

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

The abandonment of the aircraft without the engine cut-off meant an inadequate assessment of the risks involved in this circumstance and aggravated the consequences of the accident, as it allowed the fire to spread.

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-028/CENIPA/2017 - 01 **Issued on 01/29/2019**

Act together with Heringer Air Taxi Ltd., in order to improve the training offered and the guidelines issued to its crew, with the intention that these professionals operate with greater adhesion to what is provided in the manuals of the aircraft used by the company, especially to what relates to the provided checklist.

A-028/CENIPA/2017 - 02 **Issued on 01/29/2019**

Act together with Heringer Air Taxi Ltd., in order to improve the initial training form of the local flight segment used by the company, in order to contemplate all emergency procedures applicable to the aircraft, especially those associated with fire or smoke in the aircraft.

A-028/CENIPA/2017 - 03 **Issued on 01/29/2019**

Act together with Heringer Air Taxi Ltd., in order to improve its administrative and operational mechanisms to control the quality of the maintenance services performed on its aircraft (and the records of these services), as a way to prevent aeronautical occurrences.

5. CORRECTIVE OR PREVENTATIVE ACTION ALREADY TAKEN.

None.

On January 29th, 2019.