COMANDO DA AERONÁUTICA

CENTRO DE INVESTIGAÇÃO E PREVENÇÃO DE ACIDENTES AERONÁUTICOS

FINAL REPORT
A - 143/CENIPA/2014

OCCURRENCE:	**ACCIDENT**
AIRCRAFT:	**PR-NEO**
MODEL:	**EC-130B4**
DATE:	**23AUG2014**

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 23AUG2014 accident with the EC-130B4 aircraft, registration PR-NEO. The accident was classified as “[CTOL] Collision with Obstacle during Take-Off and Landing”.

During the positioning of the aircraft to park on the side of a football field, the blades of the main rotor collided against the top of the goal.

The aircraft had substantial damage.

The pilot and the passenger left unharmed.

An Accredited Representative of the *Bureau d'Enquêtes et d'Analyses pour la Sécurité de l'Aviation Civile* (BEA) - France, (State where the aircraft was designed and manufactured) was designated for participation in the investigation.

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GLOSSARY OF TECHNICAL TERMS AND ABBREVIATIONS

ANAC	Brazil's National Civil Aviation Agency
BEA	Bureau d'Enquêtes et d'Analyses pour la Sécurité de l'Aviation Civile
CA	Airworthiness Certificate
CENIPA	Aeronautical Accident Investigation and Prevention Center
CIV	Pilot's Flight Logbook
CMA	Aeronautical Medical Certificate
IFRH	Instrument Flight Rating - Helicopter
IGE	In Ground Effect
INVH	Flight Instructor Rating - Helicopter
OGE	Out of Ground Effect
PCH	Commercial Pilot License - Helicopter
PLH	Airline Pilot License - Helicopter
PPH	Private Pilot License – Helicopter
RBHA	Brazilian Regulation of Aeronautical Certification
RELPREV	Prevention Report
RS	Safety Recommendation
SBGO	ICAO Location Designator – Santa Genoveva Aerodrome, Goiânia - GO
SERIPA	Regional Aeronautical Accident Investigation and Prevention Service
UTC	Universal Time Coordinated
VEMD	Vehicle and Engine Multifunction Display

1. FACTUAL INFORMATION.

Aircraft	**Model:** EC-130B4 **Registration:** PR-NEO **Manufacturer:** Eurocopter France	**Operator:** NEO Air Taxi Ltd.
Occurrence	**Date/time:** 23AUG2014 - 1330 UTC **Location:** St. 4, Sobradinho Sector **Lat.** 16°30'02"S **Long.** 049°25'58"W **Municipality – State:** Goianira - GO	**Type(s):** [CTOL] Collision with Obstacle during Take-Off and Landing **Subtype(s):** NIL

1.1 History of the flight.

The aircraft took off from a not certified and unregistered location, in the city of Goianira - GO, to perform a local flight, with a pilot and a passenger on board.

During the landing procedure, in a soccer field, the blades of the main rotor hit the top of the goal.

The aircraft had substantial damage.

The pilot and the passenger left unharmed.

1.2 Injuries to persons.

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

1.3 Damage to the aircraft.

The aircraft had substantial damage to its main rotor blades and perforations in the tail cone structure and vertical stabilizer.

Figure 1 - Damage to the main rotor blades.

Figure 2 - Sketch of the route until the impact.

Figure 3 - Perforations on the vertical stabilizer.

1.4 Other damage.

The metal shards from the goal crossbar hit the gate of a residence 43 meters away, causing damage.

Figure 4 - Damage to the gate of a residence.

1.5 Personnel information.

1.5.1 Crew's flight experience.

Hours Flown	Pilot
Total	9.000:00
Total in the last 30 days	21:20
Total in the last 24 hours	00:40
In this type of aircraft	70:00
In this type in the last 30 days	15:00
In this type in the last 24 hours	00:40

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

1.5.2 Personnel training.

The pilot took the PPH course at the RANGEL Escola de Aviação Civil, in São Paulo - SP.

1.5.3 Category of licenses and validity of certificates.

The pilot had valid PCH and valid EC30 type, (which included model EC-130B4) and INVH Ratings.

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 3831, was manufactured by Eurocopter France, in 2004 and it was registered in the TPP category.

The aircraft had valid Airworthiness Certificate (CA).

The airframe and engine logbooks records were updated.

The last inspection of the aircraft, the "25-hours" type, was performed on 02AUG2014, by the Fênix Manutenção e Recuperação de Aeronaves Ltd. organization, in Goiânia - GO, having flown 05 hours and 45min after the revision.

1.7 Meteorological information.

The conditions were favorable for the visual flight, with visibility over 10km and a temperature of approximately 30° C.

According to the pilot, the estimated wind at the place of the occurrence was 110° of direction, intensity of 12kt and with gusts.

At Santa Genoveva Aerodrome (SBGO), in Goiânia - GO, 14 NM away from the place of occurrence, the wind ranged from 060° to 020°, between 9kt and 8kt, between 1300 (UTC) and 1400 (UTC) temperature of 30°C, without ceiling and visibility restrictions.

1.8 Aids to navigation.

Nil.

1.9 Communications.

Nil.

1.10 Aerodrome information.

The occurrence took place outside the Aerodrome.

1.11 Flight recorders.

Neither required nor installed.

1.12 Wreckage and impact information.

The final flight trajectory occurred on head 280° above a residential neighborhood (Figure 5).

Figure 5 - The dashed line in yellow indicates the approximate trajectory described by the pilot. "1" - indicates the goal; "2" - indicates the gate hit by fragments of the goal; "3" - indicates the final stop position of the aircraft; and "4" - indicates a water tank by the side of the field.

The Investigation Team obtained a flight footage, made by a cell phone camera located on the opposite side of the field, with the frontal view of the aircraft.

This video recorded images from two seconds before the impact of the main rotor blade against the obstacle. In this video, the helicopter completes the descent to the landing, about 3m from the ground, with little displacement ahead. The goal was positioned at the rear and right of the aircraft.

The approximation was made to the initial limit of the field. The helicopter stopped with its tail near the fence of the football field. The distance between the mast of the helicopter and the goal was of 5.23m.

The height of the goal was of 2.55m and the measured height from the tip of the main rotor blade to the ground was 2.47m (measured with the static blade).

Figure 6 - Position of the final stop of the helicopter.

The main rotor blade struck the top of the goal, resulting in damage to both of them. The fragments of the blade caused perforations in the structure of the tail cone.

1.13 Medical and pathological information.

1.13.1 Medical aspects.

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

1.13.2 Ergonomic information.

Nil.

1.13.3 Psychological aspects.

Not investigated.

1.14 Fire.

There was no fire.

1.15 Survival aspects.

After the aircraft stopped, the pilot and passenger normally disembarked through the doors.

1.16 Tests and research.

During the field investigation, through the information stored in the VEMD, it was found that there was no record of abnormal parameters or engine failures. The flight commands and the tail rotor assembly were also checked, which were within the normal range.

1.17 Organizational and management information.

The pilot had no employment relationship with the operator. The flight was being carried out for the purpose of accompanying an entourage in political campaign.

1.18 Operational information.

The aircraft was within the weight and balance limits specified by the manufacturer.

The pilot had a total of 9,000 flight hours, of which approximately 8,585 hours were performed on fixed wing aircraft and 415 on helicopters of various models (R-22, R-44, R-66, H-350, B -206, EC-120 and EC-130).

The pilot informed that he made a transfer flight, from a point in the city of Goianira (not certified and not registered) to a soccer field in the same city, keeping approximate heading of 190°.

Still, according to the pilot, after flying over the landing site, during the reduction of speed, between 50kt and 40kt, at around 400ft, as he started a soft left turn, he noticed a sudden yawing tendency to the left of the aircraft.

After realizing the inadvertent movement of the aircraft (left turn), the pilot commanded the right pedal, reaching its full extent. However, the aircraft even rotated about 90° around the vertical axis. Then the pilot decided to proceed immediately to landing at the destination football field.

The approximation was made to the initial limit of the field, in the heading 280°. When positioning the aircraft on the ground, the blade of the main rotor reached the goal. According to the video that registered the accident, at the time of landing, there were no people or obstacles inside the football field, on the side where the landing took place. This

video also indicated a high rate of sinking of the aircraft, in the final approach and landing phase.

The pilot reported that the aircraft had no abnormalities and that the only problem was the inadvertent yaw movement to the left, which led to the decision of immediate landing, but pointed out that during the approach the aircraft had normal controls and was stabilized.

The landing weight of the aircraft was approximately of 2,020kgf. The maximum takeoff weight was of 2,427 kgf. The altitude of the place of landing was of 783m. Under these conditions, according to the Eurocopter EC-130B4 Technical Data, using the maximum takeoff power, the aircraft had normal performance conditions, according to the EC-130B4 hovered flight charts, considering the aircraft in the ground effect (IGE - In Ground Effect) and out of Ground Effect (OGE - Out of Ground Effect).

Eurocopter France issued, to the pilots' knowledge, Service-Letter 1673-67-04. This document, in part presented in item 1.19 of this Report, deals with specific characteristics of helicopters with Fenestron, among which, the execution of left curves with low speed.

The pilot did not know Service-Letter 1673-67-04.

Figures 7 and 8 show the dimensions of the EC-130B4 aircraft.

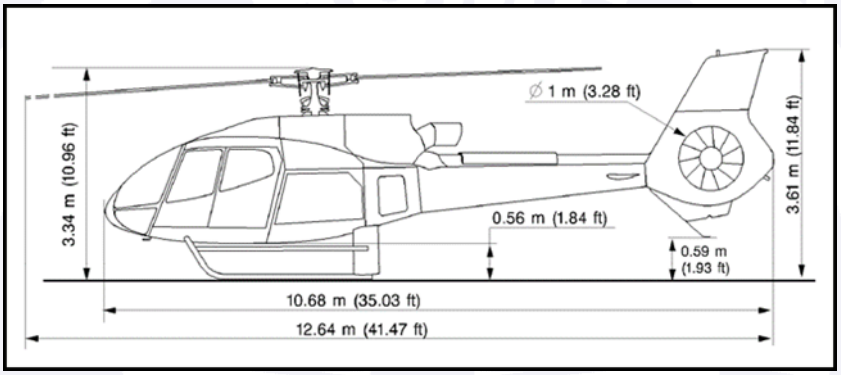

Figure 7 - Dimensions of the aircraft (EC-130B4 Technical Data).

The diameter of the circle formed by the rotation of the blades of the main rotor is of 10.69m. The distance from the main rotor mast to the tip of the main rotor blades is of 5.35m.

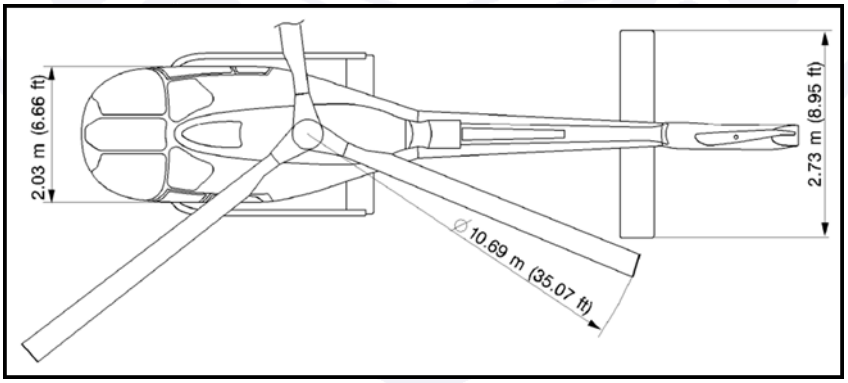

Figure 8 - Dimensions of the EC-130B4 aircraft.

1.19 Additional information.

Service-Letter 1673-67-04:

Based on the analysis of accidents and serious incidents, Eurocopter issued a Service-Letter 1673-67-04 for helicopters with main rotor clockwise rotation, when viewed from above, to alert pilots on the control of some specific flight conditions.

History

Various events, which occurred during flight near the ground and at very low speed in light wind conditions on aircraft, fitted either with conventional tail rotors or with Fenestrons, took place as follows:

From hover flight at take-off at very low speed, the Pilot initiates a left turn a few meters above the ground by applying yaw pedals towards the neutral position: the aircraft starts its rotation, which increases until the Pilot attempts to stop it by applying the RH yaw pedal.

In the various cases, which resulted in the loss of yaw axis control, the action applied to the RH yaw pedal was not enough (amplitude/duration) to stop rotation as quickly as the Pilot wished.

As the aircraft continues its rotation, the Pilot generally suspects a (total or partial) tail rotor failure and decides either to climb to gain speed or to get closer to the ground.

In the first case, increasing the collective pitch results in increasing the main rotor torque and consequently further speeds up leftward rotation. This results in the loss of aircraft control.

In the second case, sharp decrease in collective pitch can make the aircraft tilt to the side whilst rotating and cause it to touch the ground.

The investigations carried out following such events have never revealed any defect as regards flight controls and tail rotor assembly.

Furthermore, given their altitude and weight conditions the tail rotors were far from their maximum performance limits.

Important Information

In hover flight or in a very low speed flight, the pilot counteracts the leftward aircraft rotation by applying the right yaw pedal (Figure 9).

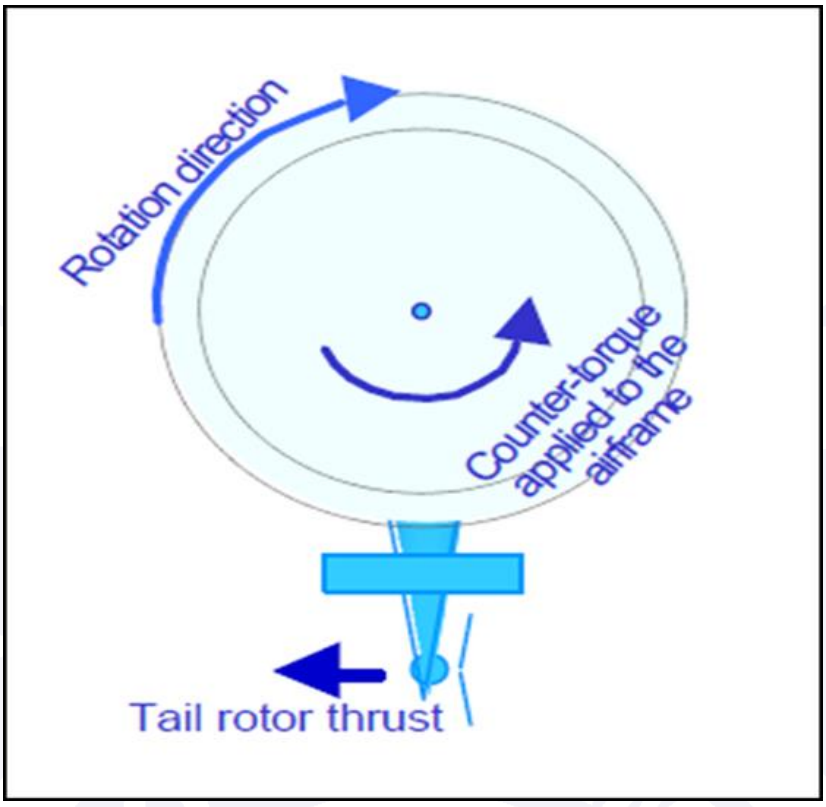

Figure 9 - Representation of the aircraft from above, without wind component.
Source: Service-Letter 1673-67-04.

When adding a light unfavorable wind (Figure 10), a leftward rotation departure can result in the aircraft's initiating a high rotation rate, if no adequate and additional action is immediately applied to the yaw pedals.

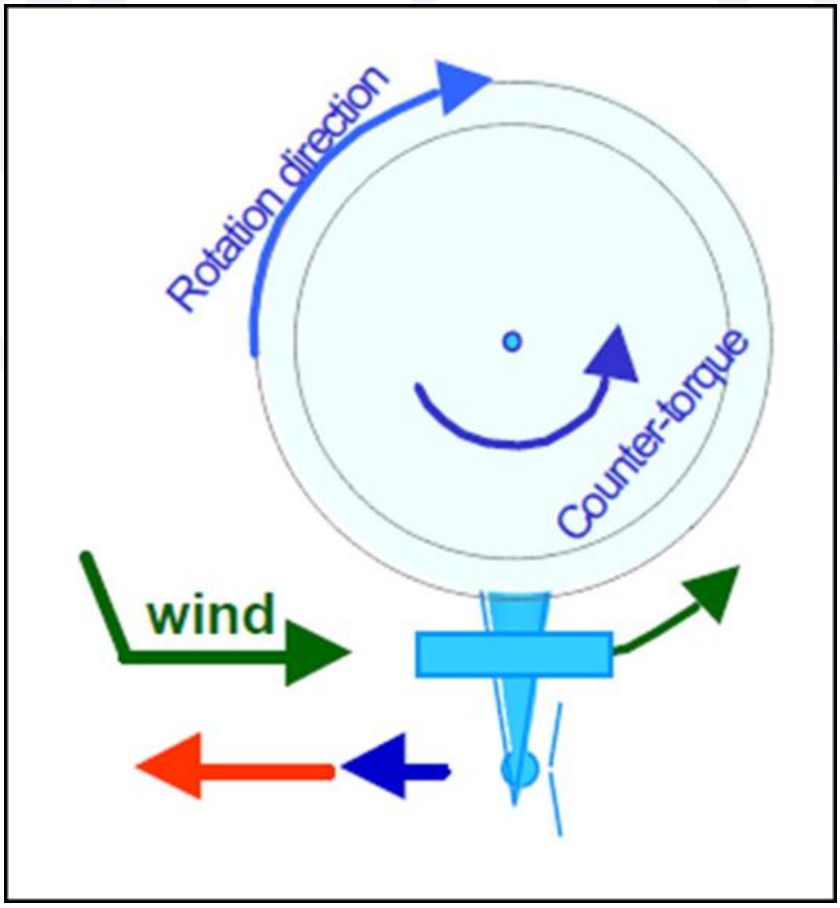

Figure 10 - Representation of the aircraft from above, added a component of left crosswind. Source: Service-Letter 1673-67-04.

A tail wind component, upon departure would worsen the problem (Figure 11).

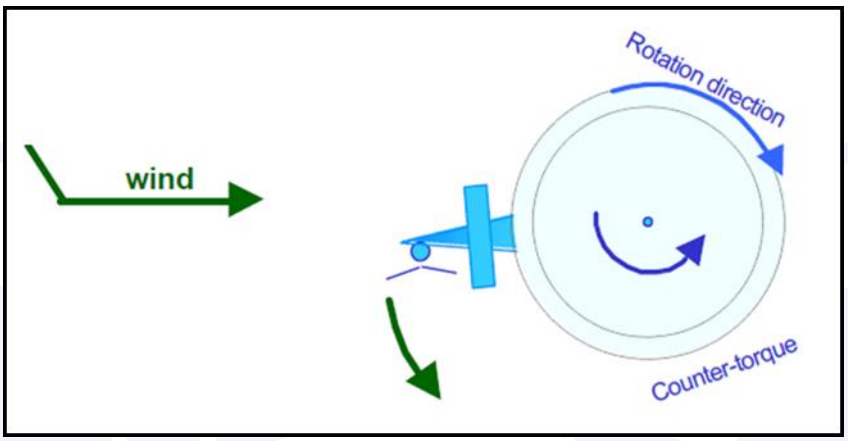

Figure 11 - Representation of the aircraft viewed from above, added a component of tail wind. Source: Service-Letter 1673-67-04.

In a quick leftward rotation, if the Pilot attempts to counteract this rotation by applying the RH yaw pedal up to a position corresponding to that of hover flight, the aircraft will not decelerate significantly!

In this situation, immediate action of significant amplitude applied to the RH yaw pedal must be initiated and maintained to stop leftward rotation. Never hesitate to go up to the RH stop.

Any delay when applying this correction will result in an increase in rotation speed.

Intentional or accidental initiation of this rotation phenomenon can therefore be physically explained and is in no way connected to the tail rotor performance; in all cases, when adequate correction is applied, rotation will stop!

Finally, it should also be remembered that any intentional maneuver to initiate leftward rotation in hover flight conditions or at very low speed, must be performed through a moderate action on the LH yaw pedal!

Additional technical information relative to various tail rotor types:

(a) Yaw pedal positions around the hover flight:

- The yaw pedal position / tail rotor thrust law curve shape is not the same for a « conventional rotor and a Fenestron. (Figure 12).

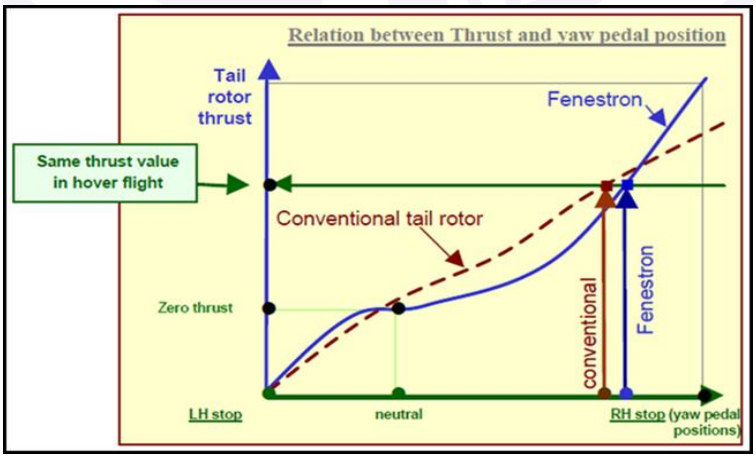

Figure 12 - Relation between thrust and the yaw pedal position, in hover flight.

Source: Service-Letter 1673-67-04.

Consequently:

- For the same thrust value needed for hover flight, the Fenestron requires a little more action to be applied to the RH yaw pedal. However, in hover flight, the same variation of yaw pedal position will result in more significant effect with the Fenestron than with the conventional rotor.

(b) Yaw pedal positions in cruise flight:

In cruise flight, the conventional rotor delivers a thrust, which comes in addition to its vertical stabilizer profile effect, to maintain zero sideslip.

As regards the Fenestron, since the fairing effect is higher due to its large surface, the thrust to be applied by the tail rotor is lower. (Figure 13).

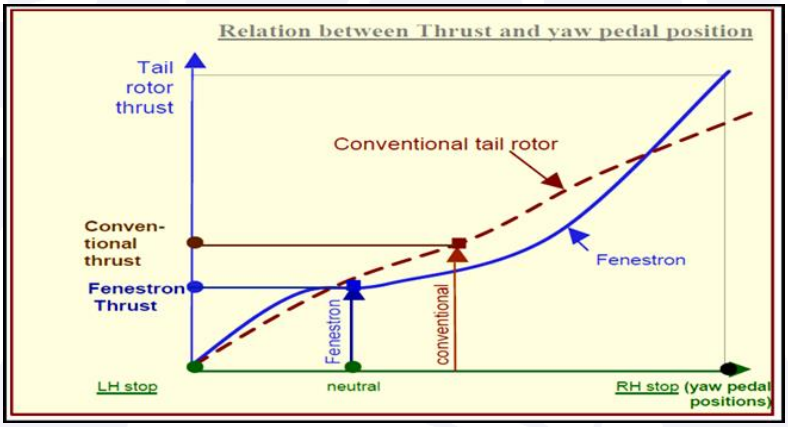

Figure 13 - Relation between thrust and position of the yaw pedal position on the cruise flight.
Source: Service-Letter 1673-67-04.

c) Transition from cruise flight to the hover flight:

With a Fenestron, when changing from cruise flight to hover flight, be prepared for a significant movement of the foot to the right.

Insufficient application of pedal would result in a leftward rotation of the aircraft during the transition to hover.

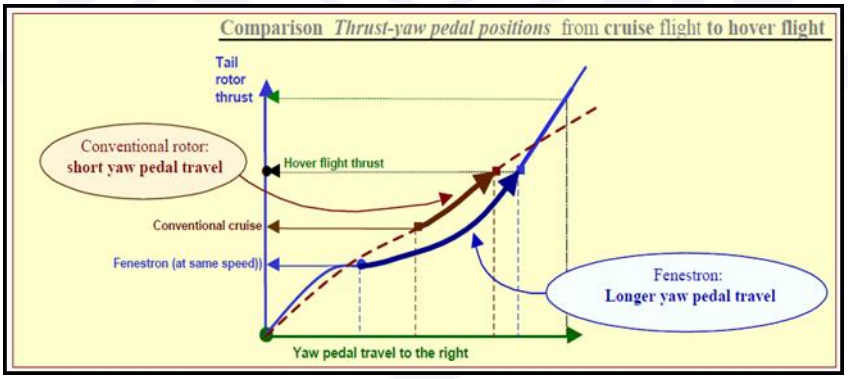

Figure 14 - Comparison between thrust and the yaw pedal position, in the transition from cruise flight to hover flight.
Source: Service-Letter 1673-67-04.

d) Using Maximum Thrust:

To stop rotation to the left, whether it is intentional or not, never hesitate to go up to yaw pedal right stop.

It can be noticed that near the right stop, the Fenestron efficiency is very high (slope of the curve - Figure 15).

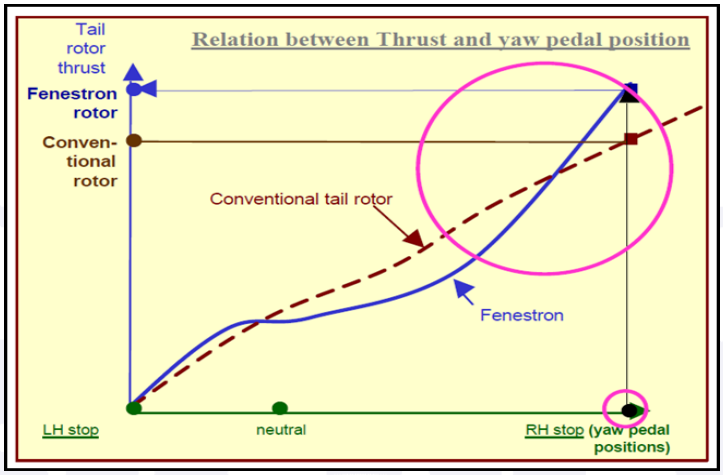

Figure 15 - Comparison between thrust and the yaw pedal position, with maximum power.
Source: Service-Letter 1673-67-04.

Service-Letter 1673-67-04 presents the following conclusion:

In hover flight or at very low forward flight speed, stopping a quick rotation to the left must be performed by immediately applying the RH yaw pedal with a significant and maintained amplitude, regardless of the tail rotor type.

In hover flight or at very low speed, intentional initiation of a turn to the left shall always be made by moderate action on the yaw pedals.

Wind coming from the left or tail wind increases the aircraft rotation speed.

Brazilian Regulation of Aeronautical Certification - RBHA 91:

> "91.327 OPERATION OF HELICOPTERS IN NOT CERTIFIED OR NOT REGISTERED LOCATIONS.
>
> (a) Notwithstanding paragraph 91.102 (d) of this regulation, helicopter landings and take-offs at not certified or not registered locations may be carried out as an occasional operation under the full responsibility of the operator (operations under RBHA 135) and / or pilot-in-command, as applicable, provided that:
>
> (1) there is no prohibition of operation at the place chosen;
>
> (2) the owner or person responsible for the site has authorized the operation;
>
> (3) the helicopter operator has taken appropriate measures to ensure the safety of the operation, the aircraft and its occupants and third parties;
>
> (4) the operation does not become routine and / or frequent;
>
> (5) if in controlled area, the operation is conducted in bilateral radio contact with the Air Traffic Control;
>
> (6) any abnormality occurring during the operation is communicated to the SERAC of the area as soon as practicable;
>
> (7) the selected location necessarily meets the following physical characteristics:
>
> (i) landing area: the landing area must be sufficient to contain at least a circle with a diameter equal to the largest size of the helicopter to be used;
>
> (ii) safety area: the landing area must be surrounded by an obstacle-free safety area with a surface area not higher than the landing area, extending beyond the boundaries of that area by half of the total helicopter length to be used;
>
> (iii) approach and take-off surfaces: the approach and take-off surfaces shall make an angle of at least 90° between them with ramps of at most 1:8 and;

(iv) Transition surfaces: in addition to the surfaces defined in paragraph (a) (7) (iii) of this section, and not coincident with them, there shall be transitional surfaces, beginning at the boundaries of the safety area, extending to up and out of these limits with a maximum ramp of 1:2."

1.20 Useful or effective investigation techniques.

Nil.

2. ANALYSIS.

In the analysis of the factors involved in this accident, the functionality of the aircraft systems was initially verified. The pilot informed that he did not identify any abnormality in the operation of the helicopter, being the inadvertent yaw movement to the left, about 90°, the only observed different fact.

The engine parameters stored in the memory of the VEMD corroborated the information of absence of breakdowns related to the engine, informed by the pilot.

In helicopters flight, a sudden left turn may induce the pilot to interpret it as a tail rotor fault (total or partial). However, in this case, this hypothesis was discarded based on the information of the pilot and the VEMD. In addition, given the altitude and weight conditions, the tail rotor was far from its maximum performance limits.

The possibility of problems related to the flight commands was also ruled out, since the functionality checks of these and the tail rotor set made in the ground after the accident indicated normal performance.

The flight profile reported by the pilot was similar to the characteristics described in Service-Letter 1673-67-04. When approaching the vertical of the landing place, the aircraft moved in the approximate heading 190°. At the site, the wind was about 110°, with intensity of 12kt and bursts.

Then, it was estimated that at 400ft the aircraft received a left wind component with gusts. This wind condition may have favored the creation of a left yaw moment on the aircraft when in hovering or at very low speed.

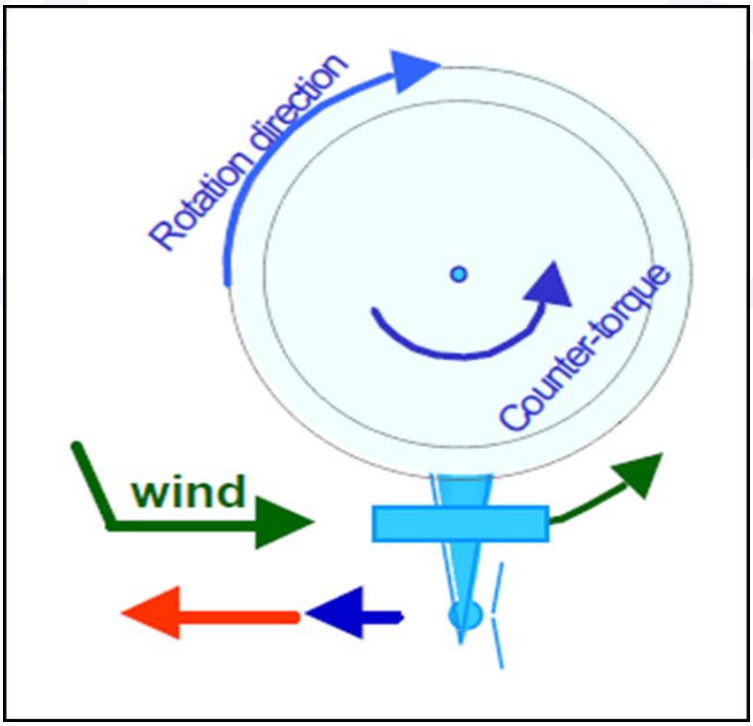

Figure 16 - Representation of the aircraft from above, added a component of left crosswind.

Source: Service-Letter 1673-67-04.

However, with speeds between 50kt and 40kt, the aircraft would not be so exposed to this yaw effect. Such a condition would be expected at lower speeds. As the aircraft did not have a flight data recorder, it was not possible to determine at what speed the inadvertent spin occurred.

By reducing the speed and starting the left turn, the pilot reported the inadvertent movement of about 90° about the vertical axis. In this condition, two important features are addressed in Service-Letter 1673-67-04.

The first refers to the transition from the cruise to the hover flight. This document mentions that with the Fenestron, when there is a change from the cruise to the hover flight, the pilot must be prepared for a significant movement of the foot to the right (Figure 17). Insufficient application of the right pedal may result in a rotation of the aircraft to the left during the transition to hovering.

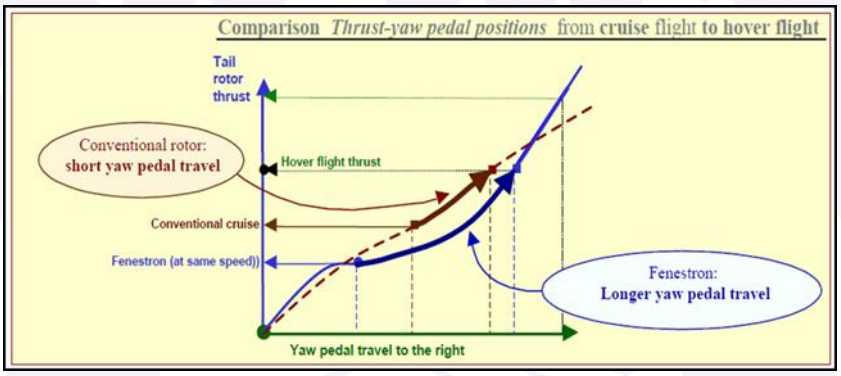

Figure 17 - Comparison between thrust and position of the yaw pedal, in the transition from the cruise flight to the hover flight.
Source: Service-Letter 1673-67-04.

The second refers to the fact that in hovering or at a very low speed, the command of a left turn must always be made with moderate application of the yaw pedals, in order to avoid the yaw movement of the aircraft to the left.

Thus, due to the absence of mechanical failures, the aircraft's yaw movement to the left, about 90° around the vertical axis can be explained by the association of factors such as left wind component with gusts, transition from cruising to lower speeds and starting a left turn, as per the Service-Letter 1673-67-04, which was issued to alert pilots.

It should be noted that the pilot in question was not aware of Service-Letter 1673-67-04.

Once the conditions that may have caused the inadvertent movement of the aircraft were determined, the factors that led to the collision of the main rotor blade against the obstacle were analyzed.

The pilot said that after the inadvertent movement of the aircraft, he recognized the reestablishment of controlled flight status, but opted to define an approach and landing immediately on the football field. During the landing, from the video that registered the accident, it was verified that before the touch, the rate of descent appeared to be elevated. In this case, although the aircraft is far from the power limits of the chart, it was not possible to rule out the possibility that this instability is related to a wind component with gusts (12kt or higher).

Through the video, it was also possible to verify that the football field was free, without people or obstacles, in the half corresponding to the place of landing.

The approximation was made to the initial boundary of the field. At landing, the helicopter was positioned at a distance lower than that recommended in RBHA 91.327 (7) (ii), presented in item 1.19 of this Report.

An obstacle-free safety area with an area no higher than the landing one has not been established, extending beyond the limits of that area by half of the total length of the helicopter to be used.

The distance from the main rotor mast to the goal was of 5.23m, the distance from the main rotor to the tip of the main rotor blade being of 5.35m. Therefore, there was not enough separation of obstacles to the landing at that location.

In addition, when measuring the height of the blade tip of the main rotor to the ground was obtained 2.47m (measurement with the static blade), being the height of the goal of 2,55m.

In this way, it can be said that the collision resulted from an inadequate judgment of the separation distances of obstacles in the landing, both lateral and vertical distance.

3. CONCLUSIONS.

3.1 Facts.

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

b) the pilot had valid EC30 type (which included model EC-130B4) Rating;

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 airframe and engine logbooks records were updated;

g) the weather conditions were favorable for the visual flight;

h) the aircraft performed a transfer flight from a not certified and unregistered location to a football field, both in the city of Goianira;

i) during the landing, the main rotor blade collided with the goal;

j) the aircraft had substantial damage; and

k) the pilot and passenger left unharmed.

3.2 Contributing factors.

- **Control skills – undetermined.**

Due to the inexistence of a flight data recorder, it was not possible to rule out the possibility that an approach to landing with an excessive rate of descent was made, even with the aircraft showing power slack in relation to the limits of the chart.

- **Piloting judgment – a contributor.**

The approach and landing were performed in a not certified and unregistered location without adequate separation of the aircraft with obstacles.

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

During the landing, there was an erroneous assessment of the aircraft's distance from the goal, which resulted in an improper approach and allowed the aircraft to collide with the goal.

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):

IG-143/CENIPA/2014 - 01 Issued on 04/08/2019

Disseminate the lessons learned in this investigation to alert pilots and helicopter operators about the importance of using the information presented in the Service-Letter 1673-67-04 as a tool for preventing aircraft accidents.

5. CORRECTIVE OR PREVENTATIVE ACTION ALREADY TAKEN.

None.

On April 08th, 2019.