COMANDO DA AERONÁUTICA

CENTRO DE INVESTIGAÇÃO E PREVENÇÃO DE ACIDENTES AERONÁUTICOS

FINAL REPORT
A-043/CENIPA/2023

OCCURRENCE:	**ACCIDENT**
AIRCRAFT:	**PT-FLK**
MODEL:	**R182**
DATE:	**11MAR2023**

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 considering 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 distinct 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 Final Report has been made available to the ANAC and the DECEA so that the technical-scientific analyses of this investigation can be used as a source of data and information, aiming at identifying hazards and assessing risks, as set forth in the Brazilian Program for Civil Aviation Operational Safety (PSO-BR).

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. Considering 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 Final Report pertains to the March 11, 2023, accident involving the Cessna R182 airplane of registration marks PT-FLK. The occurrence was typified as "[MED] Medical Conditions" and "[RE] Runway Excursion."

During landing, the aircraft landed in the last third of the runway with the landing gear retracted and overran the runway's end.

The aircraft sustained substantial damage.

The pilot did not survive, and the only passenger suffered serious injuries.

Being the USA the State of aircraft design and manufacture, the NTSB designated an Accredited Representative for participation in the investigation of the accident.

TABLE OF CONTENTS

GLOSSARY OF TECHNICAL TERMS AND ABBREVIATIONS

ADC	Aerodrome Chart
AFIS	Aerodrome Flight Information Service
ASDA	Accelerate-Stop Distance Available
ANAC	Brazil's National Civil Aviation Agency
CMA	Aeronautical Medical Certificate
CIV	Digital Pilot-Logbook
CVA	Certificate of Airworthiness
IFRA	Instrument Flight Rating - Airplane
LDA	Landing Distance Available
METAR	Routine Meteorological Aerodrome Report
MNTE	Single-Engine Landplane Class Rating
OM	Maintenance Organization
PIC	Pilot In Command
POB	Persons on board
POH	Pilot's Operating Handbook
PPR	Private Pilot License - Airplane
RBAC	Brazilian Civil Aviation Regulation
ROTAER	Air Route Auxiliary Manual
SACI	Civil Aviation Integrated Information System
SIC	Pilot Second in Command
SWWT	ICAO location designator - *Sílvio Gonçalves de Mello* Aerodrome, *Morada Nova de Minas*, State of *Minas Gerais*.
TORA	Take Off Run Available
TODA	Take Off Distance Available
TPP	Private Air Services Registration Category
UTC	Coordinated Universal Time
VAC	Visual Approach Chart

1. FACTUAL INFORMATION.

Aircraft	**Model:** R182 **Registration:** PT-FLK **Manufacturer:** Cessna Aircraft	**Operator:** Private.
Occurrence	**Date/time**: 11MAR2023 - 17:45 (UTC) **Location:** SBPR - *Carlos Prates* Aerodrome **Lat.** 19°54'33"S **Long.** 043°59'21"W **Municipality – State:** *Belo Horizonte – Minas Gerais*.	**Type(s):** [MED] Medical [RE] Runway excursion

1.1. History of the flight.

At approximately 17:00 UTC, the aircraft departed from SWWT (*Sílvio Gonçalves de Mello* Aerodrome, *Morada Nova de Minas*, State of *Minas Gerais*), bound for SBPR (*Carlos Prates* Aerodrome, Belo Horizonte, MG) on a private flight with 02 POB (a pilot and a passenger).

During landing, the aircraft overran the departure end of the runway and impacted two residential structures located beyond the runway overrun area.

Figure 1 – Final position of the aircraft after the runway excursion.

The aircraft sustained substantial damage.

The pilot suffered fatal injuries, whereas the passenger was seriously injured.

1.2. Injuries to persons.

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

1.3. Damage to the aircraft.

The aircraft sustained substantial damage throughout its entire structure.

1.4. Other damage.

There was structural damage to the masonry and electrical network of two residences located in the extended axis of the runway at some distance beyond the aerodrome limits.

1.5. Personnel information.

1.5.1. Crew's flight experience.

Hours Flown	
	PIC
Total	254:16
Total in the last 30 days	02:26
Total in the last 24 hours	01:26
In this type of aircraft	04:26
In this type in the last 30 days	02:26
In this type in the last 24 hours	01:26

Note: Flight-hour data obtained from records of the pilot's CIV (Digital Pilot-Logbook) of the Civil Aviation Integrated Information System (SACI).

1.5.2. Personnel training.

The Pilot in Command (PIC) completed his PPR course (Private Pilot – Airplane) in 2000, at *Aeroclube de Brasília*, in the Federal District.

1.5.3. Category of licenses and validity of certificates.

The PIC held a PPR license (Private Pilot – Airplane) and valid ratings for MNTE (Single-Engine Land Airplane) and IFRA (Instrument Flight – Airplane).

1.5.4. Qualification and flight experience.

The PIC's operational background consisted just of the experience gained during his training and his time flying as a private pilot. He did not personally keep track of his flight hours in his CIV. The digital CIV contained a total of 254 hours and 16 minutes of flight time, with approximately 4 hours on the accident aircraft model—with records available only after he obtained his IFRA rating in 2005.

The Investigation Committee determined that the pilot did not log most of his private flights in the SACI system. There were reports from other pilots who had conducted dual-command flights with the PIC on the PT-FLK aircraft, but such flights were not logged.

Some observers stated that the PIC frequently flew to the aerodromes of *Pampulha* and *Carlos Prates* on a weekly basis, suggesting that he had more experience in the R182 model than shown by the hours recorded in the SACI system.

Nonetheless, due to the lack of official records for flights conducted in the past 90 days, as required by Section 61.21 – "Recent Experience" of the Brazilian Civil Aviation Regulation nº 61 (RBAC-61), it was not possible to confirm whether the PIC was qualified for the flight in question.

1.5.5. Validity of medical certificate.

The pilot held a valid CMA (Aeronautical Medical Certificate).

1.6. Aircraft information.

The serial number R18201417 airplane was manufactured by Cessna Aircraft in 1979 and registered under the Private Air Services Category (TPP).

The CVA (Certificate of Airworthiness) of the airplane was valid.

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

The latest aircraft overhaul, required for the CVA renewal, took place on June 15, 2022, on the premises of *CHB Aviação Ltda.* Maintenance Organization (OM) (8904-05/ANAC) in *Pará de Minas*, State of *Minas Gerais*.

No evidence was found that mechanical failures contributed to the occurrence.

1.7. Meteorological information.

The routine Meteorological Aerodrome Reports (METAR) for SBPR contained the following information:

METAR SBPR 111700Z 09006KT 9999 SCT025 BKN100 30/18 Q1017

METAR SBPR 111800Z 08008KT 9999 SCT030 29/18 Q1016

One observed that, at 17:00 UTC, the conditions were above the minima required for VFR flights, with visibility exceeding 10 km, scattered clouds at 2,500 ft. and ceiling at 10,000 ft. The wind was 090º at 6 kt. At 18:00 UTC, the aerodrome remained suitable for VFR flights, with visibility greater than 10 km, scattered clouds at 3,000 ft. and wind 080º at 8 kt.

1.8. Aids to navigation.

NIL.

1.9. Communications.

According to the transcripts of the audio communications between the aircraft and the AFIS (Aerodrome Flight Information Service) at SBPR, the PIC did not report any mechanical failures or emergencies.

1.10. Aerodrome information.

The public aerodrome was under the administration of INFRAERO, and operated VFR during daylight hours.

The runway was asphalt-sealed, with thresholds 09/27, measuring 868 x 18 meters, at an elevation of 3,044 feet.

The declared distances for *Takeoff Run Available* (TORA), *Takeoff Distance Available* (TODA), *Accelerate-Stop Distance Available* (ASDA), and *Landing Distance Available* (LDA) were consistent with the distances described in the Aerodrome Chart (ADC), as shown in Figure 2.

RWY	TORA(m)	ASDA(m)	TODA(m)	LDA(m)
09	868	868	868	868
27	868	868	868	868

Figure 2 – Declared distances for SBPR. Source: ADC SBPR.

The runway at SBPR did not have stopways.

1.11. Flight recorders.

Not required and not installed.

1.12. Wreckage and impact information.

The aircraft touched down with the landing gear retracted on the Runway 09 of SBPR.

Evidence indicated that the aircraft made ground contact at a distance of 180 meters short of the departure end of the runway and came to a final stop approximately 74 meters after overrunning it, in a residential area outside the limits of the aerodrome. There were no marks on the ground between the departure end and the wreckage site, suggesting that the aircraft covered this distance in flight (Figure 3).

Figure 3 – Sketch of the flight path after the runway excursion.

Analysis of the wreckage revealed that the landing gear was retracted, as shown in Figure 4.

Figure 4 – The airplane with retracted landing gear at the crash site.

Additionally, the landing gear control lever was found in the “UP” position, as shown in Figure 5.

Figure 5 – Landing gear control lever in the UP position.

Surveillance cameras footage showed the aircraft with the landing gear extended during the first approach and retracted during the second landing attempt.

1.13. Medical and pathological information.

1.13.1. Medical aspects.

The forensic toxicology examination detected the presence of barbiturates in the urine.

According to accounts, the PIC had a history of epilepsy. He was undergoing medical treatment, which included the use of Primidone, a deoxybarbiturate. The hepatic biotransformation of Primidone produces two active metabolites—phenobarbital and phenylethylmalonamide—which are excreted in the urine, explaining the toxicology results indicative of the presence of barbiturates.

Following a request, the ANAC provided the pilot's medical records (Term of Responsibility, Medical History Form, Aeronautical Medical Certificate, and Aviation Medical Exam). The documents had discrepancies between the comorbidities and the medications being used.

The exercise-stress test performed by the PIC on March 8, 2022, indicated the use of Exforge HCT, Neblock, Zetia, Digesan, and Pantoprazole. However, the Term of Responsibility, filled in on March 25, 2022, did not list the corresponding comorbidities/diagnostic related to these medications. Typically, these drugs are prescribed for hypertension, dyslipidemia, and gastrointestinal disorders.

The Aviation Medical Exam Report from March 25, 2022, only noted the use of antihypertensive medication and corrective lenses.

Regarding his medical history, records indicated that the PIC had suffered from seizure episodes since childhood and had recently sought medical assistance for epilepsy.

After undergoing an electroencephalogram (EEG), he was diagnosed with left temporal lobe epilepsy.

The Investigation Committee, however, found no records indicating that this condition was reported during his CMA-renewal examinations.

The RBAC-67, Amendment 05, dated August 28, 2021, read the following:

> 67.15 Validity of the CMA
>
> [...]

> (c) The holder of a valid CMA must report to the ANAC or the certifying examiner any decline in their psychophysical capabilities that could impair their ability to exercise the privileges of their licenses and ratings without affecting flight safety. They must also refrain from exercising these privileges until obtaining a new “fit” or “fit with restriction” assessment from an examiner or from the ANAC.
>
> [...]
>
> 67.117 Neurological Requirements
>
> (a) The applicant must not have a history or clinical diagnosis of:
>
> [...]
>
> (4) Epilepsy
>
> (5) Electroencephalogram (EEG):
>
> (i) abnormal, characterized by epileptiform graph elements
>
> [...]
>
> (6) Recurring total or partial loss of consciousness or an unexplained neurological impairment that could indicate an irreversible neurological condition.
>
> [...]

Additionally, the ANAC’s Supplemental Instruction (IS) nº 67-004, Revision B, dated June 2, 2020, established the following restrictions relative to medication:

> 5. PSYCHOPHYSICAL REQUIREMENTS
>
> 5.1 General Provisions
>
> [...]
>
> 5.1.2.1 The pharmacological action of certain medications is unacceptable for aviation activities if they affect the nervous system, psychophysiological capacity, or the circadian sleep-wake cycle (such as, anxiolytics, hypnotics, anticonvulsants, mood modulators, first-generation antihistamines or antiallergics, sedatives, narcotics, anesthetics, opioids, alcohol, muscle relaxants, antidepressants, antipsychotics, neurotransmitter inhibitors or stimulants, amphetamines, fatigue inhibitors, appetite suppressants, alkaloids, sympathetic or parasympathetic nervous system inhibitors or stimulants).

The PIC’s CMA contained the following remark: *“Must wear corrective lenses and carry a spare pair of glasses.”*

Nonetheless, the forensic report did not indicate the presence of lenses or glasses on the PIC.

> 67.99 – Ophthalmological requirements
>
> [...]
>
> (c) The applicant must meet the following visual requirements:
>
> [...]
>
> (4) If corrective lenses are required to meet visual standards, the CMA must specify that the crewmember must wear corrective lenses and carry a spare pair (even when using contact lenses) while performing duties under their license and ratings.

The failure to wear corrective lenses or glasses by a pilot with such a requirement may contribute to difficulties in reading flight instruments and navigation charts, potentially leading to illusions during flight—especially during landing. These illusions may also result in judgment errors by the pilot.

Finally, the analysis of audio recordings between the AFIS operator at SBPR and the PIC suggested that the pilot was excessively calm, exhibiting signs of lethargy and slurred speech, indicating possible cognitive impairment.

1.13.2. Ergonomic information.

NIL.

1.13.3. Psychological aspects.

The pilot was 65 years old at the time of the accident and had 23 years of experience in aviation. According to accounts, despite his experience, the PIC never pursued a commercial pilot license or a flight instructor rating.

According to information gathered, although aviation was a personal passion, the PIC did not use it as a source of professional income, conducting all his flights strictly for private purposes. His primary occupation was as a physician, and he had extensive knowledge in that field.

The PIC had certain comorbidities that led him to always fly accompanied by another pilot.

By and large, until 2018, he typically invited newly certified pilots or those with limited experience to accompany him in flight. However, in 2018, an incident occurred during one of his flights, prompting family members to require that a professional pilot be hired to assume the role of aircraft captain from that point onward.

Several pilots who flew with the PIC would describe him as an experienced pilot. On rare occasions would intervention be required, none of which compromising flight safety.

Notwithstanding, there was a reported event in which the PIC became unwell during a flight, and the other pilot had to take over controls.

Some observers mentioned that the PIC frequently expressed a deep concern about family-related issues.

Additionally, according to these accounts, the PIC exhibited a significant change of behavior in the months leading up to the accident, showing signs of stress and impatience, possibly linked to his emotional state.

Finally, another notable observation from witnesses was that the PIC frequently shared his knowledge of aviation with his daughter, encouraging her to operate the controls of the airplane.

In this regard, the PIC did not consider hiring professional pilots when his daughter was present, as he believed that she could assume the role of Second-in-Command (SIC) if necessary.

1.14. Fire.

There was no evidence of either in-flight or post-impact fire.

1.15. Survival aspects.

Neither the PIC nor the passenger was able to evacuate the aircraft on their own following the impact. They were rescued by the local Fire Brigade.

1.16. Tests and research.

NIL.

1.17. Organizational and management information.

NIL.

1.18. Operational information.

The PIC departed from SWWT en route to SBPR, covering approximately 127 NM in a 45-minute flight. Onboard the airplane, were the PIC (owner of the aircraft) and a passenger.

Based on the analysis of the wreckage and information provided by the Fire Brigade, the left-hand seat was occupied by the PIC, and the right-hand seat, by the passenger.

During the flight, no mechanical issues or emergencies were reported to the air-traffic control agencies.

Witnesses reported that the PIC did not perform a traffic circuit and chose to execute a direct approach to Runway 27 instead, followed by a late touchdown on the runway. In the sequence, he initiated a ground-level go-around and attempted a second landing, this time on Runway 09.

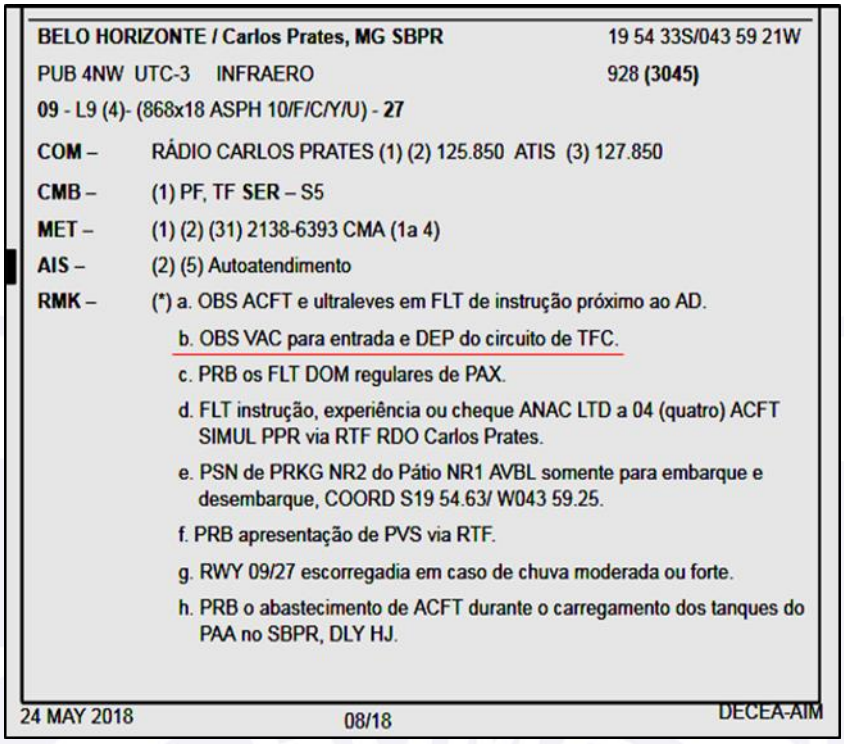
The footage from a surveillance camera showed a portion of the runway near the threshold of runway 27. The footage presented the aircraft's first landing attempt at 14:42:17 (local time), where the aircraft touched down and immediately started a go-around maneuver. A witness reported that after the ground-level go-around, the aircraft made a turn to align with the final approach, but it was not possible to confirm the direction of the turn.

Subsequently, during the second landing attempt, with the airplane approaching from the opposite direction (Runway 09), the aircraft reappeared on the camera at 14:44:27 (local time), this time with the landing gear retracted, executing a second landing 2 minutes and 10 seconds after the first attempt.

The footage indicated that the aircraft touched down with the landing gear retracted at a distance of 180 meters short of the runway’s end, a fact confirmed by tire marks left on the tarmac (Figure 6).

Figure 6 – Touchdown point of the aircraft,
180 meters short of the runway’s end.

Regarding the traffic circuit entry procedure at SBPR, the ROTAER (Air Route Auxiliary Manual), dated May 24, 2018, contained information on a Visual Approach Chart (VAC), as shown in Figure 7.



BELO HORIZONTE / Carlos Prates, MG SBPR 19 54 33S/043 59 21W

PUB 4NW UTC-3 INFRAERO 928 **(3045)**

09 - L9 (4)- (868x18 ASPH 10/F/C/Y/U) - **27**

COM – RÁDIO CARLOS PRATES (1) (2) 125.850 ATIS (3) 127.850

CMB – (1) PF, TF **SER** – S5

MET – (1) (2) (31) 2138-6393 CMA (1a 4)

AIS – (2) (5) Autoatendimento

RMK – (*) a. OBS ACFT e ultraleves em FLT de instrução próximo ao AD.

b. OBS VAC para entrada e DEP do circuito de TFC.

c. PRB os FLT DOM regulares de PAX.

d. FLT instrução, experiência ou cheque ANAC LTD a 04 (quatro) ACFT SIMUL PPR via RTF RDO Carlos Prates.

e. PSN de PRKG NR2 do Pátio NR1 AVBL somente para embarque e desembarque, COORD S19 54.63/ W043 59.25.

f. PRB apresentação de PVS via RTF.

g. RWY 09/27 escorregadia em caso de chuva moderada ou forte.

h. PRB o abastecimento de ACFT durante o carregamento dos tanques do PAA no SBPR, DLY HJ.

24 MAY 2018 08/18 DECEA-AIM

Figure 7 – Highlight of the information regarding the existence of a VAC for SBPR.
Source: ROTAER.

The VAC for SBPR, dated February 24, 2022, established the standard traffic circuit, as depicted in Figure 8.

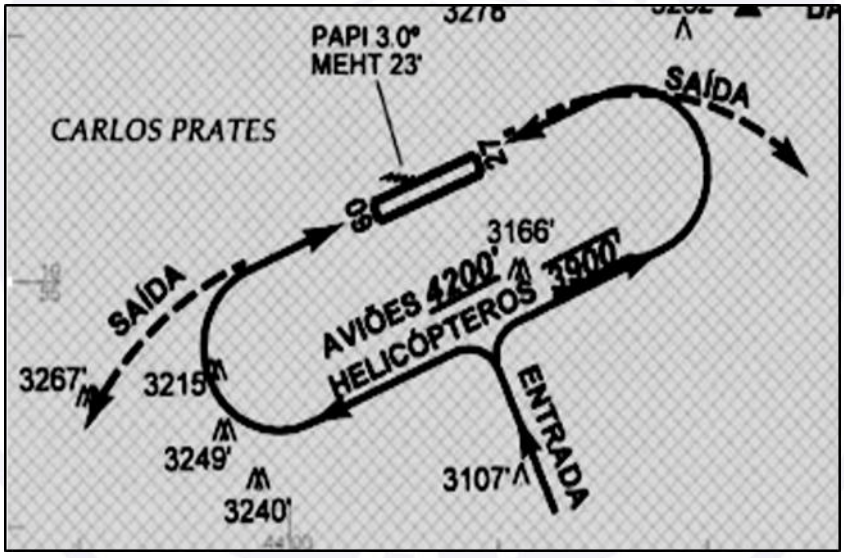
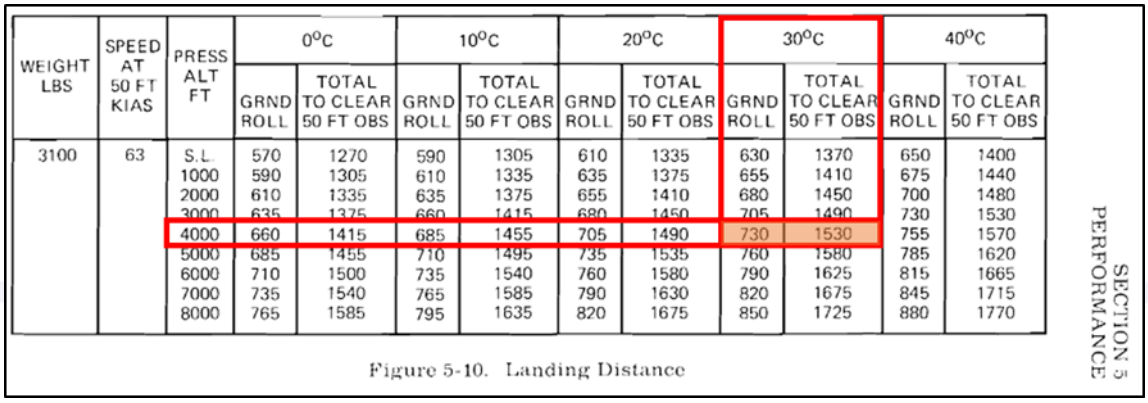


Figure 8 – Traffic Circuit for SBPR as defined in the VAC chart.

Relatively to the landing distance required at SBPR for the R182 airplane model, the Pilot's Operating Handbook (POH) had the data necessary for landing distance calculations (Figure 9).



WEIGHT LBS	SPEED AT 50 FT KIAS	PRESS ALT FT	0°C		10°C		20°C		30°C		40°C	
			GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS
3100	63	S.L.	570	1270	590	1305	610	1335	630	1370	650	1400
		1000	590	1305	610	1335	635	1375	655	1410	675	1440
		2000	610	1335	635	1375	655	1410	680	1450	700	1480
		3000	635	1375	660	1415	680	1450	705	1490	730	1530
		4000	660	1415	685	1455	705	1490	730	1530	755	1570
		5000	685	1455	710	1495	735	1535	760	1580	785	1620
		6000	710	1500	735	1540	760	1580	790	1625	815	1665
		7000	735	1540	765	1585	790	1630	820	1675	845	1715
		8000	765	1585	795	1635	820	1675	850	1725	880	1770

Figure 5-10. Landing Distance

SECTION 5 PERFORMANCE

Figure 9 – Landing Distance for the R182 Airplane Model.
Source: Pilot's Operating Handbook, page 5-27, Figure 5-10 – Landing Distance.

One considered the following data in this accident:

- Altitude: a 4,000 ft. altitude was considered for calculations, as it was the next available value above SBPR's aerodrome elevation (ROTAER, revision 08/18, dated May 24, 2018).
- Temperature: 30°C, based on the SBPR METAR at 17:00 UTC.
- Wind: 090° at 6 knots, according to the SBPR METAR at 17:00 UTC.

Still relatively to the wind, there was the following remark:

> *NOTES:*
>
> [...]
>
> **2. Decrease distances by 10% for each 9 knots of headwind. For operations with tailwinds up to 10 knots, increase distances by 10% for each 2 knots.*

Therefore, in this occurrence, given the prevailing wind conditions, no adjustments would be necessary in relation to the values presented in the table for the landing distance calculations.

As for the weight of the airplane, the manufacturer specified that the maximum landing weight equaled the maximum takeoff weight. Thus, the table only provided a value of 3,100 lb. for reference.

It was found that the landing distance required for a full stop was 730 ft. (223 m) or 1,530 ft. (467 m) if it was necessary to clear a 50-foot obstacle at the threshold. These values were lower than the total length of the SBPR runway (868 m), meaning that the available runway length should have been adequate for a normal landing.

1.19. Additional information.

NIL.

1.20. Useful or effective investigation techniques.

NIL.

2. ANALYSIS.

It was daytime VFR flight between SWWT and SBPR with duration of 45 minutes, with 02 POB (the pilot and a passenger).

The weather conditions were consistent with visual flights, and the PIC frequently flew along that route, indicating familiarity with the region.

The Investigation Committee found no evidence of mechanical failures that might have contributed to the accident.

With respect to the PIC's experience, although his digital CIV showed only 254 flight hours, data gathered by the investigators suggested in fact a higher level of experience, as the PIC had 23 years of aviation background and was the owner of the accident aircraft.

As for the SBPR aerodrome, even though neither threshold had a stopway, the runway had a length of 868 meters, being significantly longer than the required landing distance on the day of the accident.

According to the data presented in the item 1.18 of this report, the aircraft required a maximum of 467 meters to complete the landing roll.

The analysis of medical records from before the renewal of the PIC's medical certificate with ANAC, which were not presented during the examination, indicated that the PIC was using medications suggesting the treatment of comorbidities that were restrictive to aviation activities. This conclusion was based on the Pericial Health Examination Form dated 25MAR2022, which only mentioned the use of antihypertensive medication

Tests conducted close to the date of the accident confirmed the presence of deoxybarbiturate medication used for epilepsy treatment.

As a medical professional aware of his restrictions, the pilot should have ceased acting as a PIC, as required by the RBAC-67.

Additionally, the forensic report and wreckage analysis did not identify the presence of corrective lenses or glasses, which were required under the PIC's CMA. The absence of these visual aids may have impaired reading of instruments and compromised the assessment of the visual references utilized, especially during landing.

As for the psychological aspects, the PIC was dealing with personal issues that negatively influenced his emotional state. This emotional stress may have compromised flight safety by affecting concentration and judgment, increasing the likelihood of decision-making errors.

A pilot under such influences may exhibit signs of distraction, anxiety, or lethargy, which can interfere with critical functions. The emotional burden may lead to memory lapses and an inability to follow established procedures, resulting in the omission or shortening of essential steps in aircraft checklists and operational processes.

This may have degraded the PIC's piloting performance, further impacted by the use of medication, resulting in degradation of cognitive mechanisms.

The slurred speech and excessive calm during critical moments, such as the touchdown 180 meters short of the opposite threshold, suggest a neurological impairment, which resulted in the forgetfulness of landing gear extension during the second attempt to land.

The failure to initiate a go-around after an excessively long landing—mere meters from the opposite threshold—not only reflects flawed decision-making but also suggests reduced attentiveness, impairing the ability to respond appropriately and indicating dysfunctional situational awareness mechanisms.

The analysis of the operational factors revealed that the PIC did not follow the prescribed traffic pattern entry as outlined in the SBPR's Visual Approach Chart (VAC). Instead, he opted for a direct approach at a moment that mechanical failures or any other type of emergency either did not exist or went unreported.

Additionally, surveillance footage showed the PIC performing a go-around after an extended first landing. Two minutes and 10 seconds later, he attempted a second landing, again without following the standard traffic circuit.

3. CONCLUSIONS.

3.1. Findings.

a) the PIC held a valid CMA (Aeronautical Medical Certificate);

b) the PIC held valid ratings for MNTE t (Single-Engine Landplane) and IFRA (Instrument Flight – Airplane);

c) it was not possible to confirm whether the PIC was qualified for the flight;

d) the aircraft had a valid CVA (Certificate of Airworthiness);

e) the aircraft was within weight and balance limits;

f) the records of the airframe, engine, and propeller logbooks were up to date;

g) the weather conditions were above the minima required for the flight;

h) the landing was performed with the landing gear retracted;

i) during landing, the aircraft overran the departure end of the runway and collided with two residences located in the overshoot area;

j) the PIC had comorbidities incompatible with aviation activities;

k) barbiturates were detected in the forensic examination;

l) the forensic report did not indicate the presence of contact lenses on the PIC;

m) no eyeglasses were found on the pilot or amid the wreckage at the crash site;

n) the aircraft sustained substantial damage; and

o) the PIC sustained fatal wounds, and the passenger was seriously injured.

3.2. Contributing factors.

- **Attention – undetermined.**

The reduction in attention following the first landing attempt may have led to lapses in performing the landing gear extension and the go-around procedure during the second attempt.

- **Attitude – a contributor.**

The PIC was under the influence of medication that restricted flight activities. Conducting a flight while under the effects of such medication increased the operational risks due to potential side effects.

Additionally, the PIC was required to wear corrective lenses, but they were not found at the crash site, suggesting he was not wearing them during the flight.

- **Illness – undetermined.**

Reports indicated that the PIC had a history of epilepsy since childhood, a condition incompatible with aviation activities under the regulations in force.

- **Emotional state – undetermined.**

The PIC's emotional state may have compromised flight safety, affecting his concentration and judgment, increasing the likelihood of decision-making errors. A pilot under emotional strain may exhibit distraction, anxiety, or lethargy, which could interfere with critical functions. Emotional stress can also lead to memory lapses and failure to follow established procedures, potentially causing essential steps in aircraft operation to be shortened or skipped.

- **Handling of aircraft flight controls – a contributor.**

There were inappropriate control inputs during landing, resulting in a retarded touchdown of the airplane at a distance of 180 meters short of the longitudinal limit of the runway with the landing gear retracted.

- **Piloting judgment – a contributor.**

The PIC misjudged the second landing attempt, touching down with the landing gear retracted just meters short of the runway's end.

Additionally, he failed to initiate a go-around procedure before touchdown when it was still possible.

- **Memory – undetermined.**

A cognitive decline in the PIC's performance may have contributed to forgetting to extend the landing gear during the second landing attempt.

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

The landing was excessively long, something which would require a go-around maneuver.

The PIC's delayed decision-making process led to inadequate responses, contributing to the occurrence of runway excursion and collision with residential structures.

- **Medicine intake – undetermined.**

The forensic examination detected medications incompatible with aviation activities under the regulations in force.

These medications may have impaired the PIC's cognitive performance, leading to forgetting to extend the landing gear and ultimately resulting in the runway excursion.

4. SAFETY RECOMMENDATIONS

None.

5. CORRECTIVE OR PREVENTATIVE ACTION ALREADY TAKEN.

None.

On May 20th, 2025.