AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/9755		
Aircraft Registration	**ZU-JPA**	**Date of Accident**	25 November 2018		**Time of Accident**	0530Z	
Type of Aircraft	Kitfox Super Sport 7		**Type of Operation**		Private (Part 94)		
Pilot-in-command Licence Type	PPL (A)		**Age**	55	**Licence Valid**	Yes	
Pilot-in-command Flying Experience	Total Flying Hours		1876.4		Hours on Type	24.5	
Last Point of Departure	Falstaff Private Strip in Hilton, Eastern Cape						
Next Point of Intended Landing	Falstaff Private Strip in Hilton, Eastern Cape						
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)							
Falstaff Farm in Hilton, 15nm south of Queenstown Airfield (FAQT) GPS position: S32°11'16.5" E026°56'46.1" at an elevation of 4090ft							
Meteorological Information	Wind: 305° 9kts gusting 10kts; temperature: 14ºC; CAVOK						
Number of People On Board	1 + 1	**No. of People Injured**	1	**No. of People Killed**	1		
Synopsis							

A pilot and a passenger took off from a private airstrip on Falstaff farm in Hilton, near Queenstown, for a scenic flight. The aircraft took off in downslope in a south-easterly direction with a tailwind and was unable to maintain a positive rate of climb. The aircraft's right main landing gear made contact with the ground and the wheel assembly separated before impacting a perimeter fence, nosing over and coming to rest on the right side of the extended centre line. The aircraft came to rest 95 metres (m) from the threshold of Runway 32 facing the opposite direction to the take-off position.

The aircraft was destroyed; the pilot was fatally injured; and the passenger sustained serious injuries.

The investigation revealed that the aircraft was probably rotated prematurely due to a hazard (parameter fence) in its take-off path, resulting in the aircraft not attaining a positive rate of climb before crashing.

SRP Date	13 August 2019	Publication Date	28 August 2019

ABBREVIATION	DESCRIPTION
AP	Approved Person
AIID	Accident and Incident Investigation Division
AMSL	Above Mean Sea Level
CAR	Civil Aviation Regulations
CAVOK	Ceiling and Visibility OK
CVR	Cockpit Voice Recorder
°C	Degree Celsius
E	East
FAEL	East London Aerodrome
FDR	Flight Data Recorder
ft	Feet
GPS	Global Positioning System
KTS	Knots
M	Metre
METAR	Meteorological Aeronautical Reports
N/A	Not applicable
PPL	Private Pilot Licence
QNH	Query Nautical Height
S	South
SACAA	South African Civil Aviation Authority
SAPS	South African Police Service
SAWS	South African Weather Service
TBO	Time Between Overhaul
VFR	Visual Flight Rules
UTC	Coordinated Universal Time

Reference Number	**:** CA18/2/3/9755
Name of Owner/Operator	**:** Scheepers PJ
Manufacturer	**:** Skystar Aircraft Company
Model	**:** Kitfox VII SS
Nationality	**:** South African
Registration Marks	**:** ZU-JPA
Place	**:** Falstaff Private Airstrip in Hilton, Eastern Cape Province
Date	**:** 25 November 2018
Time	**:** 0530Z

All times given in this report are Coordinated Universal Time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus 2 hours.

Purpose of the Investigation:

In terms of Regulation 12.03.1 of the Civil Aviation Regulations (CAR) 2011, this report was compiled in the interest of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and ***not to apportion blame or liability****.*

Investigations Process:

The accident was notified to the Accident and Incident Investigation Division (AIID) on 25 November 2018 at about 0530Z. The Investigator/s went to Hilton on 26 November 2018 where they coordinated with all authorities on-site by initiating the accident investigation process according to Civil Aviation Regulations (CAR) Part 12 and investigation procedures. The AIID is leading the investigation as the Republic of South Africa is the State of Occurrence.

Notes:
1. Whenever the following words are mentioned, they shall mean the following:

- *Accident — this investigated accident*
- *Aircraft — the Kitfox Super Sport 7 involved in this accident*
- *Investigation — the investigation into the circumstances of this accident*
- *Pilot — the pilot involved in this accident*
- *Report — this accident Report*

2. Photos and figures used in this report are taken from different sources and may be adjusted from the original for the sole purpose of improving the clarity of the report. Modifications to images used in this report are limited to cropping, magnification, file compression; or enhancement of colour, brightness, contrast; or addition of text boxes, arrows or lines.

Disclaimer:

This report is produced without prejudice to the rights of the South African Civil Aviation Authority (SACAA), which are reserved.

1. FACTUAL INFORMATION

1.1. History of Flight

1.1.1 On 25 November 2018 at 0530Z, a pilot and a passenger took off from a private airstrip on Falstaff private farm near Queenstown, Eastern Cape Province, for a scenic flight.

1.1.2 It was reported that the aircraft took off from Runway 14 on a downslope with a tailwind of 9 knots (kts) and was unable to achieve a positive rate of climb. The aircraft's right main landing gear made contact with the ground and the wheel assembly separated from the right main landing gear and was found 90 metres (m) south-east of the wreckage. The aircraft then veered to the right before it impacted a parameter fence that was 40m from Runway 32 threshold. The aircraft continued to skid on the ground for a further 55m from the fence, nosed over and came to rest in an inverted position facing the opposite direction from take-off.

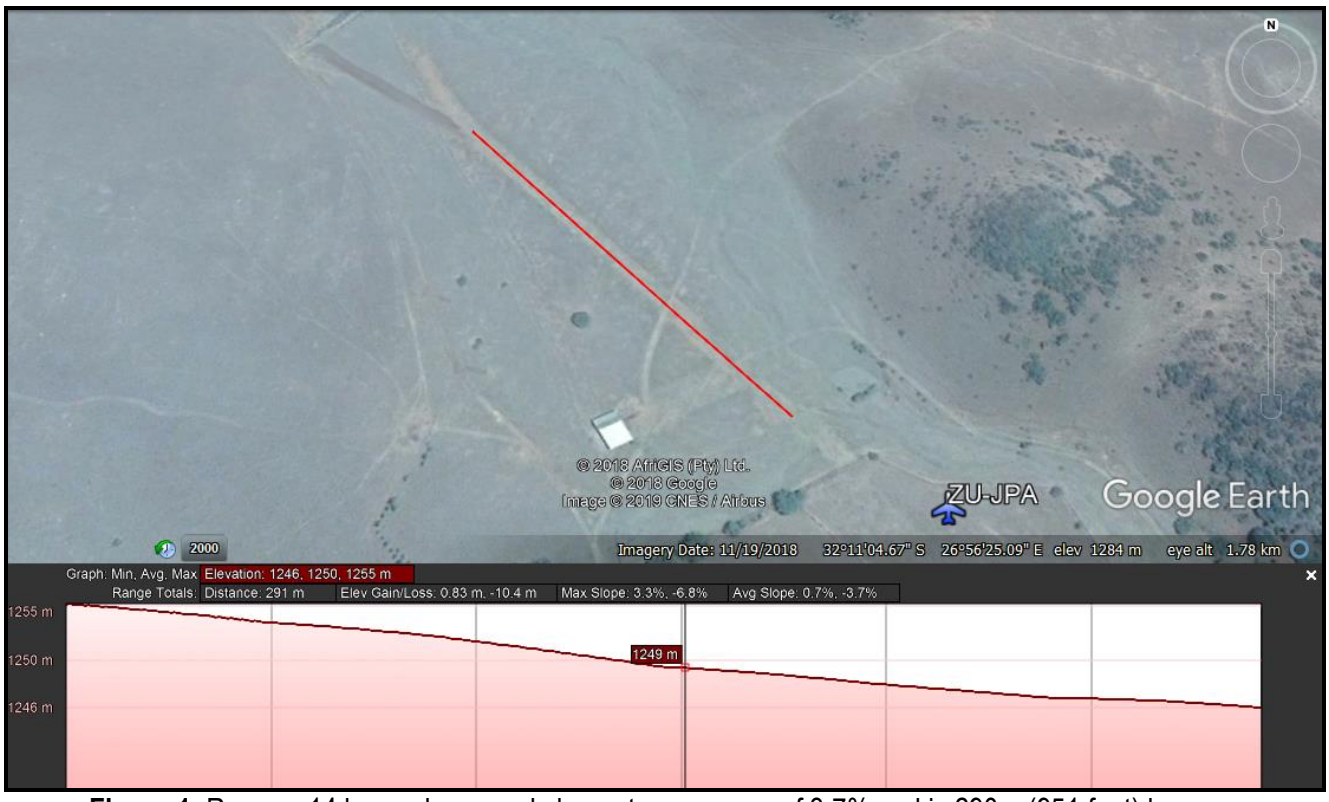

Figure 1: Runway 14 has a downward slope at an average of 3.7% and is 290m (951 feet) long.

1.1.3 The aircraft was destroyed; the pilot was fatally injured; and the passenger sustained seriously injuries.

1.1.4 The accident occurred during daylight conditions on a private farm in Hilton, Eastern Cape Province, at Global Positioning System (GPS) coordinates determined to be: S32°11'16.5" E 026°56'46.1" at an elevation of 4 090 feet (ft).

Figure 2: The aircraft as it came to rest post-accident.

1.2. Injuries to Persons

Injuries	Pilot	Crew	Pass.	Other
Fatal	1	-	-	-
Serious	-	-	1	-
Minor	-	-	-	-
None	-	-	-	-

1.3. Damage to Aircraft

1.3.1 The aircraft was destroyed.

1.4. Other Damage

1.4.1 Perimeter gate and fence situated 40m from Runway 32 threshold (See Figure 6).

1.5. Personnel Information

Nationality	South African	Gender	Male	Age	55
Licence Number	**********	Licence Type	Private Pilot Licence (Aeroplane)		
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Night				
Medical Expiry Date	30 November 2018				
Restrictions	Corrective Lenses				
Previous Accidents	None				

Flying Experience:

Total Hours	1876.4
Total Past 90 Days	5.0
Total on Type Past 90 Days	5.0
Total on Type	24.5

1.6. Aircraft Information

Airframe:

Type	Kitfox Super Sport 7	
Serial Number	KA08265140	
Manufacturer	Skystar Aircraft Company	
Date of Manufacture	2009	
Total Airframe Hours (At time of Accident)	338.2	
Last MPI (Date & Hours)	17 April 2018	311.62
Hours Since Last MPI	26.58	
C of A (Issue Date)	1 April 2010	
C of R (Issue Date) (Present Owner)	19 April 2018	
Operating Categories	Private (Part 94)	

Engine:

Type	Rotax 914 Turbo
Serial Number	4418173
Hours Since New	338.2
Hours Since Overhaul	TBO not reached

Propeller:

Type	Woodcomp SR3000
Serial Number	1559
Hours Since New	329.84
Hours Since Overhaul	TBO not reached

1.6.1 According to the Kitfox brochure, the Kitfox Super Sport 7 requires a take-off roll distance of 290ft (88m).

1.7. Meteorological Information

1.7.1 An official weather report was obtained from the South African Weather Service (SAWS) for 25 November 2018 from 0430Z to 0635Z. The following meteorological aeronautical reports (METARs) was made available for Buffelsfontein area.

Wind direction	305°	Wind speed	9kts	Visibility	CAVOK
Temperature	14°C	Cloud cover	Nil	Cloud base	Nil
Due point	unknown	QNH	unknown		

1.7.2 The wind conditions at the farm were confirmed by members of the South African Police Service (SAPS) who were the first responders after the accident was reported. The passenger on-board stated that she was unconscious and could not remember what occurred on the day of the accident.

1.8. Aids to Navigation

1.8.1. The aircraft was equipped with standard navigational equipment as approved by the Regulator (South African Civil Aviation Authority) for the aircraft type. There were no defects reported with the navigational equipment prior to the flight.

1.9. Communication

1.9.1. The aircraft was equipped with standard communication equipment as required by the Regulator. There were no defects reported with the communication equipment prior to the flight.

1.10. Aerodrome Information

Aerodrome Location	Hilton Area, Eastern Cape Province
Aerodrome Coordinates	S32°11'9.25" E026°56'39.67"
Aerodrome Elevation	4 112 feet
Runway Designations	14/32
Runway Dimensions	290m x 10m
Runway Used	14
Runway Surface	Gravel
Approach Facilities	None

1.11. Flight Recorders

1.11.1. The aircraft was neither equipped with a flight data recorder (FDR) nor a cockpit voice recorder (CVR), nor was it required by regulation to be fitted to this aircraft type.

1.12 Wreckage and Impact Information

1.12.1 The aircraft could not achieve a positive rate of climb and lost height before the right main landing gear impacted a rocky embankment. The right main wheel and brake assembly separated and were found 90m south-east of the wreckage (see Figure 4 and 5). The aircraft rotated through its vertical axis to the right before it impacted with a parameter fence along the extended centre line of Runway 14 at a distance of 40m. All three propeller blades broke off from the propeller hub during the accident sequence (see Figure 6). The aircraft came to rest in an inverted attitude 95m from the threshold of Runway 32 after flipping over (see Figure 2).

1.12.2 The flight control cables and push-pull rods were connected to their respective control surfaces and it was determined that control continuity was not compromised. No other defects were reported or recorded prior to this flight.

The propeller blades showed evidence of the engine being under power prior to the accident. During the impact, all three propeller blades separated from the hub. The damage to the propeller indicated that the engine had power at impact.

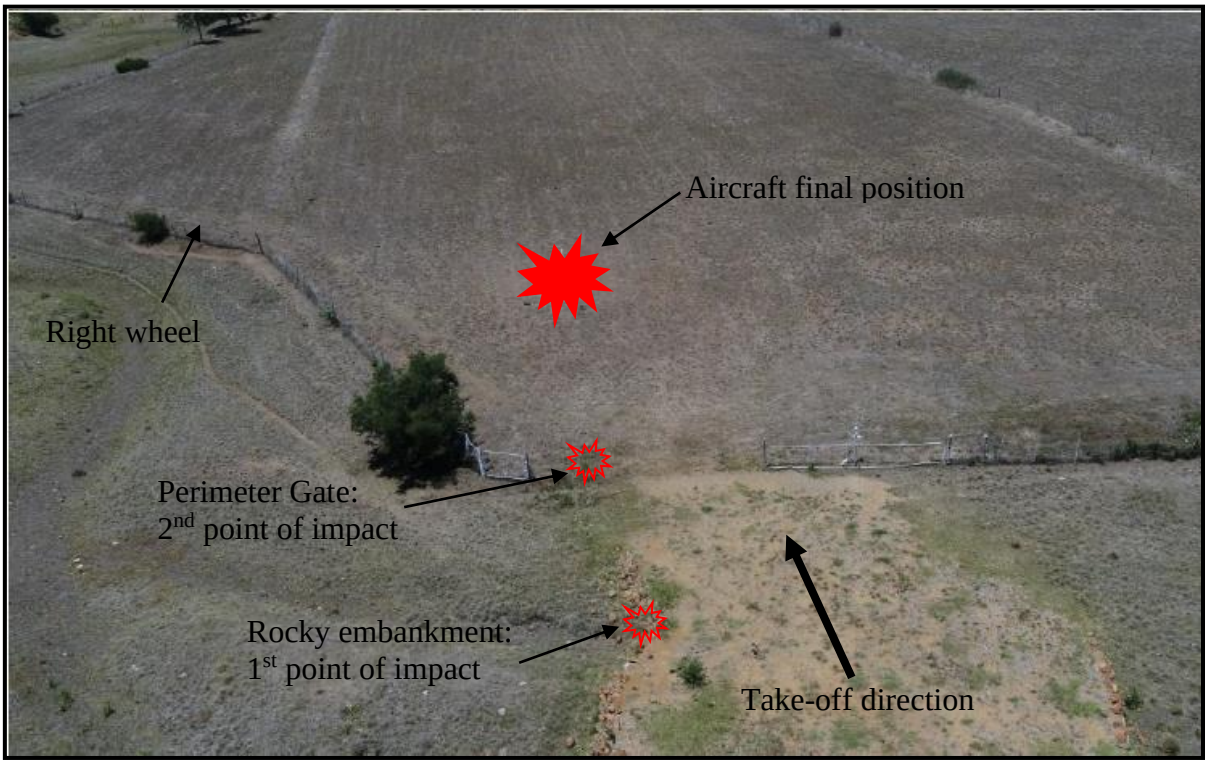

Figure 3: Aerial view of impact sequence.

Figure 4: Rocky embankment and first point of impact.

Figure 5: Right wheel and brake assembly.

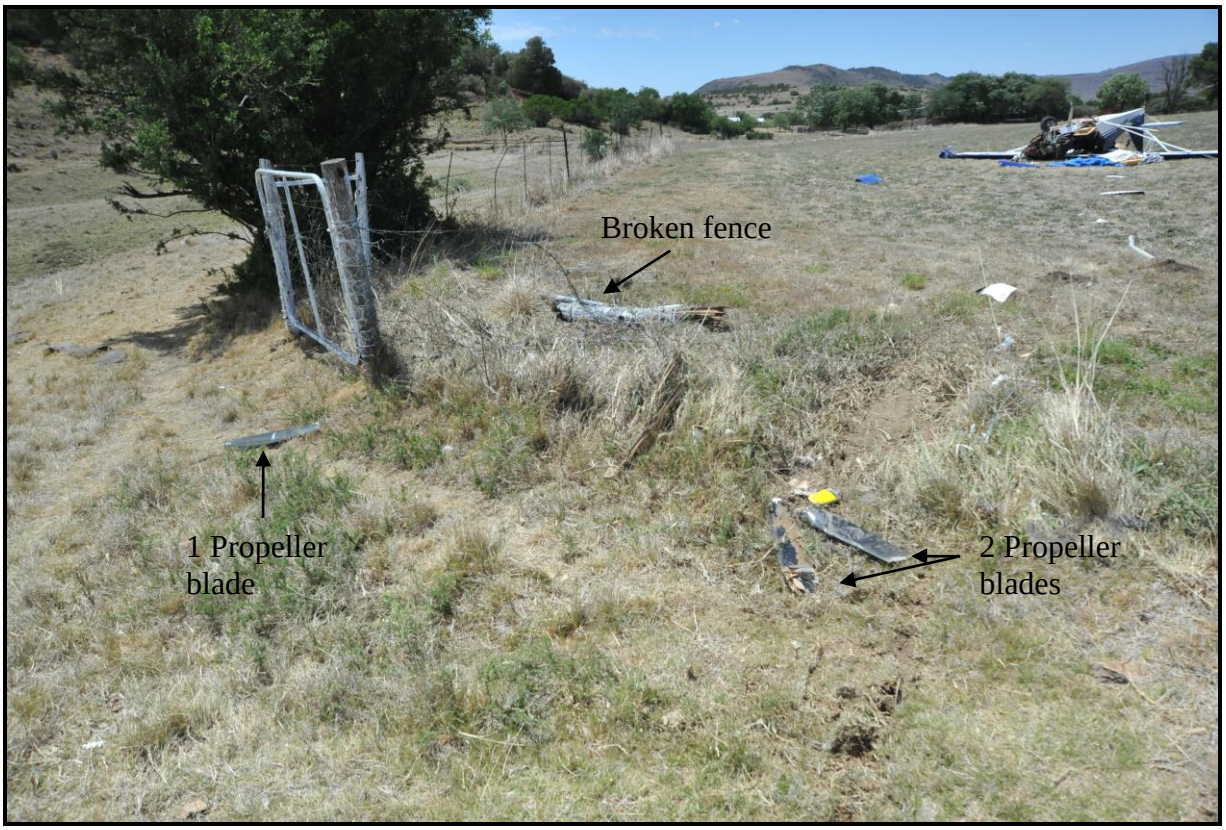

Figure 6: Damaged parameter fence, propeller blades and the wreckage.

1.13 Medical and Pathological Information

1.13.1 The post-mortem and blood toxicology reports were still outstanding at the time of compiling this report. Should any of the results have a bearing on the circumstances leading to this accident, they will be treated as new evidence that will necessitate reopening this investigation.

1.13.2 The passenger sustained serious injuries and had to be airlifted to a hospital in East London. The passenger stated that she only regained consciousness after the accident had occurred and could not remember anything.

1.14 Fire

1.14.1 There was no evidence of a pre- or post-impact fire.

1.15 Survival Aspects

1.15.1 The accident was considered unsurvivable due to the damage in the cockpit which caused a fatal injury to the pilot and serious injuries to the passenger.

1.16 Tests and Research

1.16.1 None.

1.17 Organisational and Management Information

1.17.1 The aircraft was maintained by an approved person (AP). No maintenance-related anomalies were identified regarding the performance of the aircraft.

1.17.2 The last inspection was certified on 17 April 2018 at 311.62 airframe hours after which the aircraft flew a further 26.58 hours including the accident flight.

1.17.3 The pilot owned the aircraft and it was for his for private use only.

1.18 Additional Information

1.18.1 Tailwind (www.experimentalaircraft.info)

Take-offs with tailwind will result in the use of much more runway to get enough lift for flight (it takes distance to nullify the tailwind before any headwind is obtained for lift). Climb angle is also reduced. Think about obstacles! A five-knot tailwind will increase take-off distance with 25% and a 10 knot tailwind with about 55%.

The same can be said about landing distances. The main reason executing tailwind operations could be airport noise abatement procedures or commercial operations and in case mountain airports where you land up slope and take off down slope again.

1.18.2 Take-off performance on sloped runways (*pilotworkshop.com*)

"The adjustment factors used by at least one manufacturer are as follows: Considering winds for take-off, subtract 10% ground roll for each 12 knots of headwind. Add 10% ground roll for each 2 knots of tailwind up to 10 knots. From this, you can see that tailwinds are evil. They hurt way more than headwinds help. Now, considering runway slope on take-off – an up slope of 1% causes a 22% increase in ground roll at sea level, while a 1% down slope only decreases the ground roll by 7%. Here again, the up slope hurts a lot more than the downslope helps. So, given these figures, let's look at a problem wherein we could either take-off into the wind with a 1% up slope or downwind and a 1% downslope. We learned that the up slope will cost us a 22% increase in ground roll and if we have a 6 knot head wind, we should get about 5% of that back for a total increase in our ground roll of 17%. If we choose to take-off downwind and downslope, we will get a decrease of 7% due to the slope, but an increase of 30% due to the tailwind. So, we have a total penalty of 23%.

In this example, the up slope take-off into the wind is the better choice from a ground roll standpoint. However, these calculations only consider the ground roll portion of the take-off. If there is an obstacle involved, then another calculation is needed and the effect of the wind reconsidered."

1.19 Useful or Effective Investigation Techniques

1.19.1 None.

2. ANALYSIS

2.1. General

From the available evidence, the following analysis was made with respect to this accident. These shall not be read as apportioning blame or liability to any particular organisation or individual.

2.1.1 Man

The pilot renewed his private pilot licence (PPL) on 4 May 2018 and his licence had an expiry date of 30 April 2019. He was also issued with a medical certificate on 24 April 2018 with an expiry date of 30 April 2019 and with a restrictions to wear corrective lenses. The Kitfox Super Sport 7 aircraft was endorsed on his licence.

2.1.2 Aircraft

The last maintenance inspection was carried out and certified by an approved person (AP) on 17 April 2018 at 311.26 airframe hours. The aircraft had 338.2 airframe hours at the time of the accident. No mechanical defects or malfunctions were reported prior to the flight that could have contributed to the accident. According to the Kitfox brochure, the Kitfox Super Sport 7 requires a take-off roll distance of 290ft (88m).

2.1.3 Mission

The pilot and a passenger took-off from the owner's private airstrip for a scenic flight around the Hilton and Queenstown areas. The aircraft took off in downslope in a south-easterly direction with a tailwind. The aircraft's right main landing gear made contact with the ground and the aircraft slipped to the right before impacting a gate along the perimeter fence. The aircraft crashed 61m from the runway threshold and came to rest in an inverted position facing the opposite direction from which it took off.

2.1.4 Environment

The accident occurred during daylight conditions at GPS coordinates determined to be S32°11'16.5" E026°56'46.1" at an elevation of 4 090ft above mean sea level (AMSL). According to the South African Weather Service (SAWS), fine weather conditions prevailed with a northerly wind at 9 knots (kts) on the day of the accident.

The Kitfox Super Sport 7 requires a take-off distance roll of 88m (290ft) on a non-sloping runway. The accident aircraft took off on a 3.7% down sloping runway with a 9kts tailwind. This configuration will increase the aircraft's take-off distance roll by 24%, therefore, the required distance for the time of the accident would have been 109m (358ft).

2.1.5 The investigation revealed that the aircraft was probably rotated prematurely due to a hazard (parameter fence) in its take-off path, resulting in the aircraft not attaining a positive rate of climb before crashing.

3. CONCLUSION

3.1. General

From the evidence available, the following findings, causes and contributing factors were made with respect to this accident. These shall not be read as apportioning blame or liability to any particular organisation or individual.

To serve the objective of this Investigation, the following sections are included in the conclusion heading:

- **Findings —** are statements of all significant conditions, events or circumstances in this Accident. The findings are significant steps in this accident sequence, but they are not always causal or indicate deficiencies.
- **Causes —** are actions, omissions, events, conditions, or a combination thereof, which led to this accident.
- **Contributing factors —** are actions, omissions, events, conditions, or a combination thereof, which, if eliminated, avoided or absent, would have reduced the probability of the accident or incident occurring, or mitigated the severity of the consequences of the accident or incident. The identification of contributing factors does not imply the assignment of fault or the determination of administrative, civil or criminal liability.

3.2. Findings

3.2.1 The pilot renewed his PPL on 4 May 2018 and his licence had an expiry date of 30 April 2019. The pilot conducted his last competency check on 24 April 2018 at East London Airport (FAEL). The Kitfox Super Sport 7 aircraft was endorsed on the pilot's licence.

3.2.2 The pilot's aviation medical certificate was issued on 24 April 2018 with an expiry date of 30 April 2019 and a restriction to wear corrective lenses.

3.2.3 The last maintenance inspection was carried out on 17 April 2018 at 311.26 airframe hours.

3.2.4 The aircraft had a total of 338.2 airframe hours at the time of the accident and had flown 26.94 hours since the last inspection.

3.2.5 The aircraft had an authority to fly which was issued on 17 April 2017 and had the expiry date of 16 April 2019.

3.2.6 The flight was conducted under visual flight rules (VFR) by day.

3.2.7 The weather at the time of the accident was as follows: wind 305°09kt, CAVOK, temperature 14°C. The aircraft was taking-off in a southerly direction, thus, had a tailwind component.

3.2.8 The investigation revealed that the aircraft was probably rotated prematurely due to a hazard (parameter fence) in its take-off path, resulting in the aircraft not attaining a positive rate of climb before crashing.

3.3 Probable Cause/s

3.3.1 The aircraft was probably rotated prematurely due to a hazard (parameter fence) in its take-off path, resulting in the aircraft not attaining a positive rate of climb before crashing.

4. SAFETY RECOMMENDATIONS

4.1. General

The safety recommendations listed in this report are proposed according to paragraph 6.8 of Annex 13 to the Convention on International Civil Aviation and are based on the conclusions listed in heading 3 of this report; the AIID expects that all safety issues identified by the investigation are addressed by the receiving States and organisations.

4.2. Safety Recommendation/s

4.2.1 None.

5. APPENDICES

5.1 None.