SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Section/division **Occurrence Investigation**

Form Number: CA 12-12a

AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/8097		
Aircraft Registration	**ZU-ACF**	**Date of Accident**	2 April 2006		**Time of Accident**	0840Z	
Type of Aircraft	Kitfox iv		**Type of Operation**		Private		
Pilot-in-command Licence Type	Private		**Age**	37	**Licence Valid**	No	
Pilot-in-command Flying Experience	Total Flying Hours		176.2		Hours on Type	31.2	
Last point of departure	Bela-bela (Warmbaths), Limpopo Province: FAWA						
Next point of intended landing	Kitty Hawk Aero Estate Aerodrome, Gauteng Province: FAKT						
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)							
GPS position S 24˚ 56.359' E028˚ 17.948', near the town of Bela-bela (Warmbaths)							
Meteorological Information	Clear skies were reported with light and variable wind conditions and the temperature at approximately 25°C at the time and place of the accident.						
Number of people on board	1+1	**No. of people injured**	1	**No. of people killed**	**1**		

Synopsis

On 2 April 2006 the South African Police Services from Bela-bela (SAPS) informed the South African Civil Aviation Authority (SACAA) that a pilot, accompanied by a passenger, had departed in daylight conditions from Bela-bela in the Limpopo province on a private flight to Kitty Hawk Aero Estate Aerodrome in Gauteng and that the aircraft had crashed shortly after take-off, while in the climb. It was also reported that the engine failed and that the pilot attempted to turn back to the airport, but in the process allowed the aircraft to stall.

On the same day, a two-man investigation team was dispatched by the SACAA to investigate the accident.

Evidence on the site indicated that the aircraft had impacted with the terrain in a steep nose-down configuration with the right wing low. This is indicative of entering a spin manoeuvre from which the pilot was unable to recover. A post-impact fire had erupted, destroying the aircraft and causing minor damage to the immediate vegetation around the initial impact point.

Probable Cause

Evidence on the site indicated that the aircraft had impacted with the terrain in a steep nose-down configuration with the right wing low. This is indicative of entering a spin manoeuvre from which the pilot was unable to recover.

Contributing Factor:
The pilot displayed poor technique by turning 180° at low level (200 ft AGL) in an attempt to return to the aerodrome

IARC Date		Release Date	

AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : Pretorius P.S.
Manufacturer : Skystar Aircraft Company
Model : Kitfox iv
Nationality : South African
Registration Marks : ZU-ACF
Place : Bela-bela
Date : 2 April 2006
Time : 0840Z

All times given in this report are Co-ordinated 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 (1997) this report was compiled in the interests of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and **not to establish legal liability**.*

Disclaimer:

This report is given without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION

1.1 History of Flight:

1.1.1 On 2 April 2006 the pilot, accompanied by a passenger, departed in daylight conditions from Bela-bela in the Limpopo province on a private flight to Kitty Hawk Aero Estate Aerodrome in Gauteng.

1.1.2 Shortly after take-off, while in the climb, the engine started losing power and the pilot attempted to turn back to the airport. In the process, the pilot allowed the aircraft to stall and enter a spin manoeuvre from which he was unable to recover, and the aircraft subsequently crashed into a maize field south-west of the aerodrome.

1.1.3 During the sequence of events, the pilot sustained fatal injuries and the passenger serious injuries.

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 by the impact forces and the post-impact fire.

Fig 1: Above are the remains of the aircraft after the impact and the ensuing fire.

1.4 Other Damage

1.4.1 Apart from fire damage to the surrounding vegetation, there was no other damage.

1.5 Personnel Information

Pilot-in-Command

Nationality		South African			
Licence No		Gender	Male	Age	37
Licence valid		No Expired on 13 February 2006	Type Endorsed	Yes	
Ratings		None			
Medical Expiry Date		31 January 2007			
Restrictions		Nil			
Previous Accidents		Nil			

Flying Experience:

Total Hours	176.2
Total Past 90 Days	Unknown
Total on Type Past 90 Days	Unknown
Total on Type	31.2

NOTE: The pilot's logbook was destroyed in the accident. The total hours flown and the total hours flown on type, were obtained from records during his last licence renewal on 11 February 2005.

1.6 Aircraft Information

Airframe:

Type	Kitfox iv
Serial #	1709
Manufacturer	Skystar Aircraft Company
Year of Manufacture	1992
Total Airframe Hours @ Last Annual Inspection	1422
Hours since Last Annual Inspection	5.6
Authority to Fly (Issue date)	23 May 2003
C of R (Issue Date)	21 December 2004

Engine:

Type	Rotax 912S
Ser #	4427061
Hours since New	1422
Hours since Overhaul	TBO not reached yet

Propeller:

Type	IVO
Ser #	Nil
Hours since New	1422
Hours since Overhaul	N/A

1.7 Meteorological Information

No official observations are available regarding the time and place of the accident.

According to the South African Weather Services, the most likely weather conditions at the place of the accident were as shown in the table below:

Wind direction	180˚ TN	Wind speed	05 Kts	Visibility
Temperature	26.0˚C	Cloud cover	SCT @ 3000' AGL	Good
Dew point	12.0˚C			

Surface analysis (0900Z on 2 April 2006)

A shallow low-pressure cell was present in the Bela-bela area with a high pressure system over the far northern areas and over the western part of the country.

Upper Air Analysis

A high pressure system was present over the central interior with south-easterly winds at 700 hPa in the Bela-bela area.

1.8 Aids to Navigation

1.8.1 The aircraft was equipped with standard navigational equipment for the aircraft type as approved by the regulator. No defects were reported or recorded prior, during or after the flight.

1.9 Communications

1.9.1 The aircraft was only equipped with standard communication equipment for the aircraft type as approved by the regulator. No defects were reported or recorded prior, during or after the flight.

1.9.2 There was no recorded communication with any Air Traffic Control Centre or aircraft on the ground.

1.10 Aerodrome Information

Aerodrome Location	FAWA, Bela-bela (Warmbaths), Limpopo Province
Aerodrome Co-ordinates	S24° 54.3' E028° 18.1'
Aerodrome Elevation	3640'
Runway Designations	03/21
Runway Dimensions	1200m (3937 ft) x 23m
Runway Used	21
Runway Surface	Gravel

Fig 2:
The aircraft took off from Bela-bela aerodrome and crashed 2.57nm south-west of the aerodrome.

1.11 Flight Recorders

1.11.1 The aircraft was not fitted with either a FDR (Flight Data Recorder) or a CVR (Cockpit Voice Recorder) and none of these were required by the regulations.

1.12 Wreckage and Impact Information

1.12.1 Evidence on the site indicated that the aircraft impacted with the terrain on a heading of 102°M in a steep nose-down configuration with the right wing low. This is indicative of entering a spin manoeuvre from which the pilot was unable to recover.

1.12.2 A post-impact fire erupted, destroying the aircraft and causing minor damage to the immediate vegetation around the initial impact point.

1.12.3 Due to the severity of his injuries, it was not possible to interview the passenger.

1.12.4 However, according to a witness who saw the aircraft shortly before it crashed, the aircraft was flying in a westerly direction at approximately 200 ft AGL. He stated that he heard the engine dying and restarting several times before it turned into an easterly direction, towards the aerodrome. Shortly after the aircraft turned towards the aerodrome it disappeared out of his sight, followed by a loud thud and a fire.

1.12.5 The witness then ran towards the fire where he assisted a person to move away from the aircraft. Another person (pilot) was trapped in the aircraft but he was unable to assist this person in getting out as a result of the heat due to the ensuing fire.

1.13 Medical and Pathological Information

1.13.1 According to the medico-legal post-mortem examination, no specific anatomical cause of death could be given. However, the cause of death due to severe burns was not ruled out.

1.13.2 No forensic chemistry laboratory test of a blood sample was received at the time of compiling this report. Should any be received that may have an influence on the outcome of this accident, the report may be revised.

1.14 Fire

1.14.1 The aircraft was destroyed during the accident sequence and the post-impact fire.

Fig 3:
Minor damage was caused to the immediate vegetation around the initial impact point.

1.15 Survival Aspects

1.15.1 The severity of the impact as well as the damage due to post-impact fire rendered this accident to be not-survivable.

1.16 Tests and Research.

1.16.1 Fuel:

1.16.1.1 The fuel tank of the aircraft was destroyed during the ensuing fire.

1.16.1.2 No evidence could be found that the aircraft was refuelled prior to the accident.

1.16.1.3 The ignition switch was found in the "ON" position.

1.16.2 Mechanical:

1.16.2.1 Although the aircraft sustained extensive damage during the accident sequence and the ensuing fire, the on-site investigation revealed neither evidence of mechanical failure on any of the primary flight control systems, nor any evidence of structural failure anywhere in the aircraft structure prior to the accident.

1.16.3 Engine and Carburettors:

1.16.3.1 Unfortunately the engine and both carburettors sustained extensive fire damage and it was not possible to assess whether these were serviceable prior to the accident.

1.16.3.2 The sparkplugs of the engine were removed for examination and appeared to be in a good condition. It was also established that the engine turned freely.

1.17 Organisational and Management Information

1.17.1 None.

1.18 Additional Information

1.18.1 None.

1.19 Useful or Effective Investigation Techniques

1.19.1 None.

2. ANALYSIS

2.1 Shortly after take-off, while in the climb, the engine probably lost power. According to a witness who saw the aircraft shortly before it crashed, the aircraft was flying in a westerly direction at approximately 200 ft AGL. He stated that he heard the engine dying and restarting several times before it turned in an easterly direction (eg 180°) towards the aerodrome. Site evidence suggested that the pilot allowed the aircraft to stall and enter a spin manoeuvre from which he was unable to recover, and it subsequently crashed into a maize field south-west of the aerodrome. During the accident sequence the pilot sustained fatal injuries and the passenger serious injuries.

2.2 The aircraft was destroyed by the impact forces and the post-impact fire and minor fire damage was sustained to the surrounding vegetation.

2.3 The pilot held a valid licence and a valid medical certificate as a private pilot and according to the CAA records he was also rated on the aircraft type.

2.4 According to available information, the aircraft was correctly maintained.

2.5 The weather did not contribute to this accident.

2.6 The aircraft was equipped with standard navigational and communication equipment for the aircraft type and no defects were reported or recorded prior, during or after the flight.

2.7 The aircraft was not fitted with any Data Recorders and none were required by the regulations.

2.8 Evidence on the site indicated that the aircraft had impacted with the terrain on a heading of 102°M in a steep nose-down configuration with the right wing low. A post-impact fire erupted, destroying the aircraft and causing minor damage to the immediate vegetation around the initial impact point. Due to the severity of his injuries, it was not possible to interview the passenger.

2.9 A witness stated that shortly before the aircraft crashed, it was flying in a westerly direction at approximately 200 ft AGL. He stated that he heard the engine dying and restarting several times before it turned in an easterly direction, towards the aerodrome. Shortly after the aircraft had turned towards the aerodrome it disappeared out of his sight, followed by a loud thud and a fire. He stated that he then ran towards the fire where he assisted a person to move away from the aircraft. He also stated that another person (pilot) was trapped in the aircraft but he was unable to assist this person in getting out as a result of the heat due to the ensuing fire.

2.10 According to the medico-legal post-mortem examination, no specific anatomical cause of death could be given. However, the cause of death due to severe burns was not ruled out. No forensic chemistry laboratory test of a blood sample was received at the time of compiling this report. Should any be received that may have an influence on the outcome of this accident, the report may be revised.

2.11 The fuel tank of the aircraft was destroyed during the ensuing fire. No evidence could be found that the aircraft was refuelled prior to the accident. The ignition switch was found in the "ON" position. Due to the severity of the ensuing fire it is clear that there was fuel in the aircraft at the time of the accident. From the above it may be concluded that the possibility exists that the fuel may have been contaminated, leading to a possible loss of power or even an engine failure, necessitating the pilot to carry out a forced landing.

2.12 Although the aircraft sustained extensive damage during the accident sequence and the ensuing fire, the on-site investigation revealed neither evidence of mechanical failure on any of the primary flight control systems, nor any evidence of structural failure anywhere in the aircraft structure prior to the accident.

2.13 The engine sparkplugs were removed for examination and appeared to be in a good condition. It was also established that the engine turned freely. Unfortunately the engine and both carburettors sustained extensive fire damage and it was not possible to assess whether it was serviceable prior to the accident.

3. CONCLUSION

3.1 Findings

3.1.1 On 2 April 2006, the pilot, accompanied by a passenger, departed from Bela-bela on a local private scenic flight in daylight conditions.

3.1.2 Shortly after take-off, while in the climb, the engine started losing power and the pilot attempted to turn back to the airport.

3.1.3 The pilot allowed the aircraft to stall and enter a spin manoeuvre from which he was unable to recover and it subsequently crashed into a maize field south-west of the aerodrome.

3.1.4 The passenger sustained serious injuries and the pilot fatal injuries during the sequence of events.

3.1.5 The pilot was the holder of an invalid Private Pilot's Licence, a valid unrestricted medical certificate and was rated on the aircraft type.

3.1.6 The aircraft was maintained as per the prescribed regulations.

3.1.7 Fine weather conditions prevailed at the time of the accident.

3.1.8 The on-site investigation did not reveal any mechanical failures.

3.2 Probable Cause/s

3.2.1 Evidence on the site indicated that the aircraft had impacted with the terrain in a steep nose-down configuration with the right wing low. This is indicative of entering a spin manoeuvre from which the pilot was unable to recover.

3.2.2 Contributing Factors:

3.2.2.1 The pilot displayed poor technique by turning 180° at low level (200 ft AGL) in an attempt to return to the aerodrome.

4. SAFETY RECOMMENDATIONS

4.1 None

5. APPENDICES

5.1 None

Report reviewed and amended by Advisory Safety Panel: 28 July 2009.

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