SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Section/division **Accidents and Incidents Investigations Division** Form Number: CA 12-12a

AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/3/2/0786		
Aircraft Registration	**ZU-MEG**	**Date of Accident**	16 May 2010		**Time of Accident**	0930Z	
Type of Aircraft	Jabiru J430		**Type of Operation**		Private		
Pilot-in-command Licence Type	Private		**Age**	43	**Licence Valid**	Yes	
Pilot-in-command Flying Experience	Total Flying Hours		213,9		Hours on Type	213,9	
Last point of departure	Pilanesberg Aerodrome (FAPN) – North West Province						
Next point of intended landing	KittyHawk Aerodrome (FAKT) – Gauteng Province						
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)							
Approximately 150 m into the overshoot area at Kitty Hawk Aerodrome (FAKT)							
Meteorological Information	Wind direction: north-easterly; Windspeed: 15 kt; Cloud cover: 4/8; Cloud base: 6 500 ft; Visibility: good.						
Number of people on board	1 + 1	**No. of people injured**	0	**No. of people killed**	0		

Synopsis

The pilot and passenger were engaged in a private flight under visual flight rules from Pilanesberg Aerodrome to Kitty Hawk Aerodrome. The pilot stated that at approximately 0930Z they flew overhead the runway at Kitty Hawk and she executed normal circuit procedures. On the descent and approach to runway 01 she had zero degrees flap-setting selected. Three other aeroplanes landed before the accident aircraft.

Over the threshold and prior to touchdown, the pilot experienced an updraft which forced the aircraft to land far down the runway. The runway itself had a slight downward slope, and according to the pilot, this contributed in the aircraft not coming to a stop in time. The aeroplane rolled past the end of the runway into the grassy overshoot area and came to a halt about 150 m further on.

The aircraft was substantially damaged, but the occupants did not sustain any injury.

Probable Cause

The pilot landed too far down runway 01, which sloped downwards towards its end. The slope increased the rolling speed of the aircraft, preventing the brakes from bringing the aircraft to a stop in time.

Contributory cause: the pilot did not select full flaps prior to landing.

IARC Date		Release Date	

AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : Du Preez G M J
Manufacturer : Shadow Lite CC
Model : Jabiru J430
Nationality : South African
Registration Marks : ZU-MEG
Place : KittyHawk Aerodrome (FA
Date : 16 May 2010
Time : 0930Z

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 interest 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 The pilot and passenger were engaged in a private flight under visual flight rules from Pilanesberg Aerodrome to Kitty Hawk Aerodrome. The pilot stated that at about 0930Z they flew overhead the runway at Kitty Hawk and she executed normal circuit procedures. On the descent and approach to runway 01 she had zero degrees flap-setting selected. Three other aeroplanes landed before the accident aircraft. Over the threshold of runway 01 and prior to touchdown, the pilot experienced an updraft, which forced the aircraft to land far down the runway. The runway itself also had a slight downward slope, and according to the pilot, this contributed in the aeroplane not coming to a stop before the end of the runway.

1.1.2 The indicated airspeed of the aircraft was 65 kts during landing. The pilot said that it was impossible to attempt a go-around due to the lack of remaining runway and the fact that their forward speed had reduced to about 50 kts, which was below the required rotation speed. There were also power lines in the way. She therefore selected full flaps to reduce speed and cut the engine to minimise damage to the engine and propeller.

1.1.3 The aeroplane rolled past the end of the runway into the grassy overshoot area and came to a stop approximately 150 m further on, suffering substantial damage in the process. Neither occupant sustained any injury.

1.2 Injuries to Persons

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

1.3 Damage to Aircraft

1.3.1 The aircraft sustained substantial damage.

Figure 1. The aircraft after coming to rest in the overshoot area.

1.4 Other Damage

1.4.1 None.

1.5 Personnel Information

Nationality	South African	Gender	Female	Age	43
Licence Number	xxxxxxxxxxxx	Licence Type	Private		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Flight Test – single engine piston				
Medical Expiry Date	30 April 2011				
Restrictions	None				
Previous Accidents	None				

Flying Experience:

Total Hours	213,9
Total Past 90 Days	49,7
Total on Type Past 90 Days	49,7
Total on Type	213,9

1.6 Aircraft Information

Airframe

Type	Jabiru J430	
Serial Number	646	
Manufacturer	Shadow Lite CC	
Date of Manufacture	2009	
Total Airframe Hours (at time of accident)	131,1	
Last Annual Inspection (Date & Hours)	29 April 2010	109,9
Hours since Last Annual Inspection	21,2	
Authority to Fly (Issue Date)	30 April 2010	
C of R (Issue Date) (Present Owner)	6 February 2009	
Operating Categories	Private Authority to Fly	

1.6.1 The aircraft departed FAPN to FAKT with 87 litres (134 lbs) of fuel on board. Approximately 60 litres (92 lbs) was found on board at the time of the accident. The fuel was considered sufficient for the flight.

1.6.2 The mass and balance of the aircraft are shown below. The data is based on information in the pilot's questionnaire.

	Mass	**Empty Mass**	**Max Permissible Mass**
Fuel quantity	60 litres	340 kg	700 kg
Pilot	80 kg	Pilot + Passenger + Fuel + Baggage = Payload 60 kg + 88 kg + 60 kg + 80 kg = 288 kg Empty Weight + Payload = y 340 kg + 288 kg = 628 kg MTOW – Empty Weight – Payload = x 700 kg – 340 kg – 288 kg = 72 kg	
Passenger	88 kg		
Baggage	70 kg		

The aircraft was approximately 72 kg below the maximum takeoff mass (MTOW).

Engine

Type	Jabiru 3300
Serial Number	33A1959
Hours since New	131,1
Hours since Overhaul	TBO not reached

Propeller

Type	Sensenich Wooden 60x55
Serial Number	AH 7128
Hours since New	131,1
Hours since Overhaul	TBO not applicable

1.7 Meteorological Information

1.7.1 Weather information as submitted by the pilot:

Wind direction	NNE	Wind speed	15 kt	Visibility	Good
Temperature	Unknown	Cloud cover	4/8	Cloud base	6 500 ft
Dew point	Unknown				

1.8 Aids to Navigation

1.8.1 The aircraft was fitted with standard navigation equipment as approved for the type. The pilot did not report any defect or malfunction with the equipment and it was thus considered to be in a serviceable condition.

1.9 Communications

1.9.1 The aircraft landed at an unmanned aerodrome with no communication facility. The pilot was required to broadcast her intentions on frequency 120.65 MHz.

1.9.2 The aircraft had a handheld radio installed. The pilot did not report any defect or malfunction with this radio and it was thus considered to be serviceable.

1.10 Aerodrome Information

Aerodrome Location	KittyHawk Aerodrome (FAKT)	
Aerodrome Co-ordinates	S25˚5142.0 E028˚26 49.0	
Aerodrome Elevation	4 586 ft	
Runway Designations	01/19	
Runway Dimensions	810 m x 18 m	
Runway Used	01	
Runway Surface	Tar	
Approach Facilities	None	

1.11 Flight Recorders

1.11.1 The aircraft was not fitted with a Cockpit Voice Recorder (CVR) or a Flight Data Recorder (FDR) and neither was required by regulations to be fitted to this type of aircraft.

1.12 Wreckage and Impact Information

1.12.1 The accident site was at Kitty Hawk Aero Estate, a private aerodrome in Gauteng. The aircraft approached the airfield from a north-easterly direction in a landing configuration for runway 01.

1.12.2 The aircraft landed far down the runway, with the wheels touching down approximately 100 m from the threshold. The runway length remaining was approximately 710 m, which the pilot considered to be insufficient to bring the aircraft to a stop. The aircraft continued its landing roll over the end of the runway into an uneven overshoot area covered with long grass. Due to the roughness of the terrain, the landing gear failed and the aeroplane slid on its belly until it came to a stop approximately 150 m from the end of the runway. The landing gear, propeller blade tips and fuselage sustained damage.

1.13 Medical and Pathological Information

1.13.1 None.

1.14 Fire

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

1.15 Survival Aspects

1.15.1 The accident was considered to be survivable. The impact forces caused damage to the landing gear, but the fuselage was still intact after the accident. Both pilot and passenger were properly restrained with safety belts and harnesses, and neither sustained any injury. After coming to a stop, they evacuated the aircraft.

1.15.2 The accident occurred at a private aerodrome without emergency rescue services. People at the aerodrome assisted the pilot and passenger, and no emergency services were dispatched to the accident site.

1.16 Tests and Research

1.16.1 According to the website of the aircraft manufacturer, Shadow Lite CC, the landing distance (ground roll) of the Jabiru J430 at 700 kg is approximately 250 m (820 ft), while the takeoff distance (ground roll) is about 150 m (492 ft).

(i) The mass and balance (weight) of the aircraft was calculated using information submitted by the pilot and the following was determined:

The aircraft weight was approximately 628 kg at the time of landing. At this weight, the landing distance (ground roll) required was calculated to be approximately 226 m (741 ft), while the takeoff distance (ground roll) was about 126 m (413 ft).

1.16.2 According to the pilot's operating handbook (POH), the takeoff and landing procedure of the aircraft is as follows:

Normal landing:

Airspeed	57 KIAS
Wing flaps	Fully down (below 70 KIAS)
Touchdown	Main wheels first
Landing roll	Lower nose wheel gently
Braking	Minimum required

Normal takeoff:

Wing flaps	1st stage
Carburettor heat	Cold
Throttle	Full, open
Elevator control	Lift nose-wheel at 25-30 KIAS and wait for aircraft to fly itself off (at about 55 KIAS)
Climb speed	65 KIAS until flaps retracted, then 72 KIAS
Fuel boost pump	Off at top of climb

(i) The pilot indicated that the landing speed had been approximately 65 kt and after touchdown the airspeed was reduced to about 50 kt. Once on the runway, she lowered flaps fully to reduce speed. The remaining runway length was not enough to bring the aircraft to a stop with the brakes.

1.17 Organisational and Management Information

1.17.1 This was a private flight. The owner/pilot utilised the aircraft for private operations, which was in compliance with applicable regulations.

1.17.2 The aircraft was maintained by an approved aircraft maintenance organisation (AMO) in compliance with applicable regulations. The AMO had a valid approval certificate.

1.18 Additional Information

1.18.1 The accident aircraft was one of a group of 17 Jabirus that flew from FAPN on the day of the accident. When the group arrived at FAKT, they formed a line and landed at their own discretion. The accident aircraft landed fourth. The pilots who landed before the accident aircraft confirmed that the conditions were not favourable and might have caused an updraft, resulting in the accident aircraft landing far down the runway.

1.18.2 The information which the pilot supplied on the physical conditions at the aerodrome were confirmed by the aerodrome management, namely that runway 01 did have a gradual down slope and there were power lines 2 km south of the aerodrome and 300 feet above the runway elevation. However, the management was of the opinion that these obstacles were at a safe distance and the runway length (810 m) was long enough for a successful go-around.

1.19 Useful or Effective Investigation Techniques

1.19.1 None.

2. ANALYSIS

2.1 The pilot flew the aircraft on a private flight from FAPN to FAKT. The flight was uneventful until the landing procedure, during which the pilot experienced an updraft resulting in the aircraft landing too far down the runway. According to the information obtained from the pilot, several factors played a role in preventing a go-around as well as contributing to the accident: the remaining runway length was too short, the runway had a slope, there were power lines on the southern side, and the aircraft had too low a forward speed to do a go around. The aeroplane continued its landing roll over the end of the runway onto the clearway. The landing gear broke and aircraft sustained substantial damage.

2.2 The runway length is approximately 810 m long. The pilot approached it at approximately 65 KIAS. The aircraft touched down about 100 m from the threshold, which meant that about 710 m of runway remained. The landing speed was then reduced to approximately 50 KIAS. The pilot assessed the situation and after taking the above factors into account, decided not to perform a go-around. All attempts made to bring the aircraft to a stop failed and the remaining runway length was too short for the aircraft to stop in time. When the pilot realised that the aeroplane was going to roll over the end of the runway, she shut down the engine to minimise the damage. The aircraft rolled onto the clearway, the landing gear collapsed and the aeroplane slid on its fuselage before coming to a stop about 150 m from the threshold.

2.3 According to calculations performed during the investigation to determine the runway length needed to do a safe landing, it was found that the pilot could have brought the aircraft to a stop within 226 m. The pilot had 710 m available but failed to do so.

2.4 The pilot mentioned that the runway slope might have contributed in the aircraft not coming to a stop. It was determined, however, that the slope was located only towards the end of the runway (the threshold of runway 19) and not at the place which the pilot identified.

2.5 The pilot was concerned about the power lines on the south side of the runway. It was found, though, that these were about 2 000 m from the aerodrome and that all other potentially hazardous obstacles were at the required safe distance from the aerodrome and at a safe height.

2.6 Another issue raised was that the aircraft's speed had been too low to attempt a go-around. According to the POH, the nose-wheel of the aircraft may be lifted from the runway at 25 to 30 KIAS and the aircraft should be allowed to fly itself off at about 55 KIAS. If the pilot had not shut down the engine during the landing roll but had rotated prior to reaching the end of the runway, she could have completed a successful go-around.

2.7 Based on the above, discrepancies were identified with the information which the pilot provided in the investigation. It was concluded that the possibility exists that the pilot did experience an updraft during the landing. However, the claim that the aircraft had touched down approximately 100 m from the threshold was considered to be incorrect. If it had been true, the pilot would have had no problem in stopping the aircraft on the runway, as the remaining 710 m would have been more than enough. It is believed that the aeroplane landed perhaps halfway down the runway, touching down near to the slope. The aircraft thus began rolling down, increasing its forward speed drastically. The speed would have been too high for the pilot to attempt braking. The result was that the aircraft continued rolling over the end of the runway and stopped only in the overshoot area.

3. CONCLUSION

3.1 Findings

3.1.1 The pilot had a valid private pilot's licence and an aviation medical certificate without restrictions.

3.1.2 The owner used the aircraft for private operations, which was in compliance with applicable regulations.

3.1.3 The aircraft had a valid Private Authority to Fly and was considered to be in a serviceable condition.

3.1.4 The aircraft was maintained by an AMO which had a valid approval certificate issued in accordance with applicable regulations.

3.1.5 The pilot flew the aircraft on a private flight from FAPN under visual flight rules by day to FAKT.

3.1.6 The flight was uneventful until the pilot landed on runway 01.

3.1.7 The pilot stated that the aircraft landed too far down the runway, touching down approximately 100 m from the threshold, and could not come to a stop before reaching the end of the runway.

3.1.8 The aircraft rolled onto the clearway on the south side of the runway and came to a stop about 150 m from the threshold.

3.1.9 It was determined that during normal landing, the aircraft required a landing roll distance of approximately 226 m to come to a stop. There was approximately 710 m of runway available to bring the aircraft to a stop.

3.1.10 The power lines referred to by the pilot were about 2 km south of the aerodrome.

Due to the location and distance of these, it was determined that they posed no safety risk in the event of a go-around.

3.1.11 The takeoff procedures indicated that the pilot could have initiated takeoff when the aircraft reached approximately 25 to 30 KIAS and waited until the aircraft flew itself off at about 55 KIAS.

3.1.12 The pilot decided not to do a go-around due to the following factors: “The remaining runway length that was too short, the slope on the runway, the obstacle of power lines on the south of the aerodrome and the low forward speed of the aircraft”.

3.1.13 The engine was shut down during the landing roll with the intention of preventing damage to the engine and propeller.

3.1.14 The mass and balance of the aircraft were within limits and there was sufficient fuel for the flight.

3.1.15 The aircraft sustained substantial damage in the accident.

3.1.16 The pilot and passenger suffered no injuries.

3.2 Probable Cause/s

3.2.1 The pilot landed too far down runway 01, which sloped downwards towards its end. The slope increased the rolling speed of the aircraft, preventing the brakes from bringing the aircraft to a stop in time.

3.2.2 Contributory cause: the pilot did not select full flaps prior to landing.

4. SAFETY RECOMMENDATIONS

4.1 None.

5. APPENDICES

5.1 None.

Report reviewed and amended by the Advisory Safety Panel 21 September 2010.

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