SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Section/division **Occurrence Investigation** Form Number: CA 12-12a

AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/9122		
Aircraft Registration	ZU-BFP	**Date of Accident**	10 January 2013		**Time of Accident**	0420Z	
Type of Aircraft	Windlass Aquilla		**Type of Operation**		Commercial		
Pilot-in-command Licence Type	RPL		**Age**	54	**Licence Valid**	Yes	
Pilot-in-command Flying Experience	Total Flying Hours		± 1634.98		Hours on Type	± 1228.53	
Last point of departure	Wintervogel Private Airfield (Western Cape Province)						
Next point of intended landing	Wintervogel Private Airfield (Western Cape Province)						
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)							
To the left of the threshold of Runway 08 at Wintervogel Private Airfield at a GPS position of S 33˚37'674" E 18˚40'947"							
Meteorological Information	**Wind:** NW / 3kts **Visibility**: CAVOK **Temperature** 11˚C **Cloud Cover**: 3/8 to 4/8 **Cloud base**: 3000ft **Dew point:** 9.511˚C **Visibility:** CAVOK						
Number of people on board	1+1	**No. of people injured**	0	**No. of people killed**	2		
Synopsis							

A Windlass Aquilla microlight, with a pilot and a passenger on-board took-off from Runway 08 at Wintervogel Private Airfield. They flew a left hand circuit and on the base leg of the circuit the microlight impacted the ground to the left of the threshold of Runway 08.

Both the pilot and passenger were fatally injured and the aircraft was consumed by the post-impact fire.

Probable Cause

The cause of the accident is undetermined

IARC Date		Release Date	

AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : Mr P. Louw
Name of Operator : Aquilla Microlight Safaris
Manufacturer : Solo Wings
Model : Windlass Aquilla
Nationality : South African
Registration Marks : ZU-BFP
Place : Wintervogel Private Airfield
Date : 10 January 2013
Time : 0420Z

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 (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 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 (Chronological order)

1.1.1 On 10 January 2013, at approximately 0415Z, an Aquila microlight with registration ZU-BFP, took-off from Runway 08 at Wintervogel Private Airfield with two persons onboard.

1.1.2 Eye witness accounts indicate that the microlight took-off and flew a left hand circuit off Runway 08.

1.1.3 5 Minutes into the flight a lady who resides on the farm saw the microlight flying in the direction of the hangars.

1.1.4 Shortly after that she heard a noise/explosion. She immediately looked in the direction of where the microlight was and saw that the microlight had impacted the ground and burst into flames. She stated that she immediately saw blue and then black smoke.

1.1.5 Several people at the farm rushed to the accident site as they also heard the microlight crash and then explode.

1.1.6 The farm workers extinguished the post-impact fire.

1.2 Injuries to Persons

1.2.1

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

1.3 Damage to Aircraft

1.3.1 The microlight was consumed by the post impact fire.

Figure 1: The remains of the microlight

1.4 Other Damage

1.4.1 Fire damage was caused to the vegetation in the area of the accident.

Figure 2: Burnt vegetation at accident site

1.5 Personnel Information

Nationality	South African	Gender	Male	Age	54
Licence Number	0270489560	Licence Type	NPL		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Instructor Grade A				
Medical Expiry Date	31 October 2014				
Restrictions	None				
Previous Accidents	None				

Flying Experience

Total Hours	± 1634.98
Total Past 90 Days	Unknown
Total on Type Past 90 Days	Unknown
Total on Type	± 1228.53

NOTES

- Hours for the 90 days prior to the accident could not be confirmed as there was no evidence to substantiate the actual hours flown since 20 November 2012.

- Hours reflected above are as per the pilot logbook on 19 November 2012.

1.6 Aircraft Information

Airframe:

Type	Windlass Aquilla	
Serial Number	WA 593	
Manufacturer	Solo Wings CC	
Date of Manufacture	14 March 1997	
Total Airframe Hours (At time of Accident)	No record of hours flown since last Annual inspection	
Last Annual (Date & Hours)	413.4 hours	1 September 2012
Hours since Last Annual	Unknown	
Authority to fly (Issue Date)	7 September 2012	
C of R (Issue Date)	3 August 2009	
Operating Categories	Private use	

Engine:

Type	Rotax 582
Serial Number	4890002
Hours since New	N/A
Hours since Overhaul	24.6 as at 1 September 2012

Propeller:

Type	3 Blade NC Prop
Serial Number	Unknown
Hours since New	413.4 as at 1 September 2012
Hours since Overhaul	Not applicable

Wings :

Type	Solo Wings
Serial Number	WA593
Hours since New	413.4 as at 1 September 2012
Hours since Overhaul	Not applicable

1.7 Meteorological Information

1.7.1 Information obtained from the South African Weather Services

Wind direction	315°	Wind speed	3kt	Visibility	Clear
Temperature	11°C	Cloud cover	(3/8 to 4/8)	Cloud base	3000ft
Dew point	9.5°C				

1.8 Aids to Navigation

1.8.1 The aircraft was equipped with standard navigational equipment as approved by the Regulator. No defects were recorded to navigational equipment before the flight.

1.9 Communications.

1.9.1 The aircraft was equipped with standard communication equipment as approved by the Regulator. No defects were recorded to communication equipment before the flight.

1.9.2 There are no records of any radio calls having been made by the pilot.

1.10 Aerodrome Information

Aerodrome Location	Wintervogel Private Airfield	
Aerodrome Co-ordinates	S 33°37’ 674	E 18°40’ 947”
Aerodrome Elevation	350ft	
Runway Designations	02/20	08/26
Runway Dimensions	1000m	800m
Runway Used	RWY 08	
Runway Surface	Grass/Gravel	

1.11 Flight Recorders

1.11.1 The microlight 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 wreckage was found at Wintervogel Private Airfield, adjacent to the hangars

Figure 3: Wintervogel Private Airstrip

Figure 4: Runway 08

1.12.2 The microlight was completely consumed by the post-impact fire. The wreckage covered an area of 6m x 6m. The wreckage strewn on the ground was minimal and in close proximity to the main wreckage.

Figure 5: The wreckage

1.12.3 The accident site was a dry area of field with low vegetation of up to 20cm in height. Approximately 50m away, there is a row of tall eucalyptus trees. There are also 4 hangars to the right of the accident site.

Figure 6: The accident site

1.13 Medical and Pathological Information

1.13.1 A post-mortem examination of the pilot and passenger showed that the cause of the death was consistent with multiple deceleration injuries and consequences.

1.13.2 The results of the toxicology tests were not available at the time the report was compiled. Should any of the results, once received indicate that medical aspects may have affected the performance of the pilot, this will be considered as new evidence and the investigation re-opened

1.14 Fire

1.14.1 The microlight was consumed by the post-impact fire.

1.14.2 The fire services were contacted but arrived on scene shortly after the fire had been extinguished. This is due to the fact that the scene is located in a remote area not close to a town.

1.14.3 The fire was extinguished by the farm workers.

1.15 Survival Aspects

1.15.1 The pilot and passenger sustained deceleration injuries and died on impact. They also sustained post mortem burns. The severity of their injuries sustained, indicate that the microlight flew into the ground with great impact forces.

1.15.2 Although the pilot and passenger were properly restrained by the aircraft safety harnesses, the accident was not considered survivable due to high kinetic forces during the impact, as well as the post-impact fire.

Figure 7: Secured with safety harnesses before take-off

1.15.3 An EMS ambulance and helicopter also arrived on site with medical personnel; however they were unable to assist the pilot and passenger as they died on impact.

1.16 Tests and Research

1.16.1 An engine teardown inspection was done after the accident at a SACAA approved maintenance organisation in the presence of two accident investigators.

1.16.2 No defects could be found with the engine.

1.16.3 Severe carbon build up was found on the pistons of the engine.

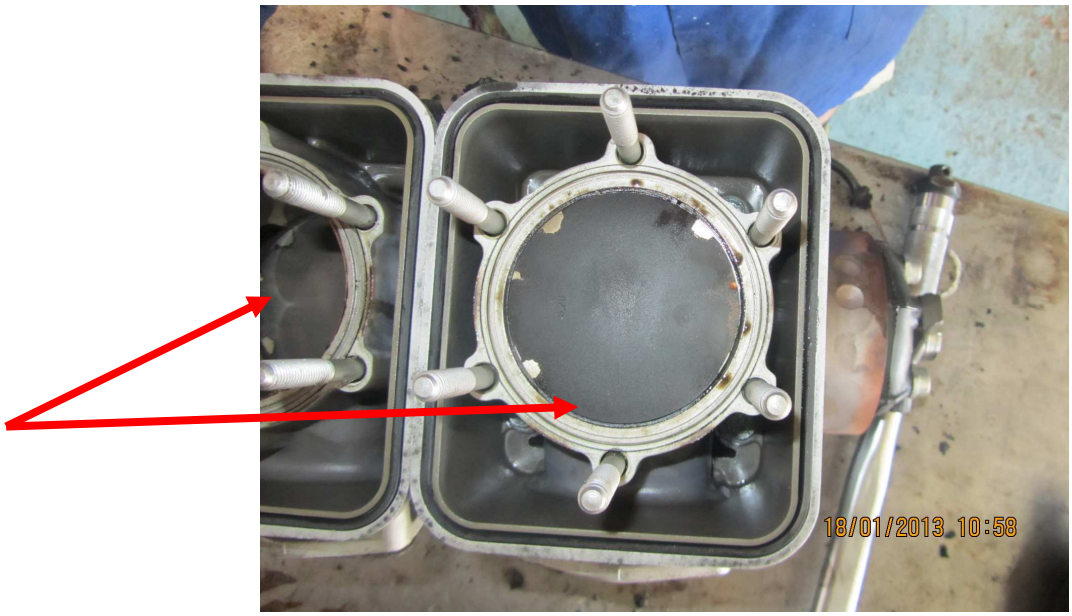

Figure 8: Carbon build-up on the pistons

1.17 Organizational and Management Information

1.17.1 The Certificate of Registration was issued on 3 August 2009 and was still in the previous owner's name at the time of the accident.

1.17.2 The Authority to Fly was still in the previous owner's name at the time of the accident.

1.17.3 The last maintenance carried out on the aircraft prior to the accident was an annual inspection certified by Approved Person No. 165, who was accredited by the Aero Club of South Africa. The annual inspection was certified on 1 September 2012 at 413.4 airframe hours.

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1.17.4 The Aviation Training Organisation certificate found at the facility indicated that the approval had expired on 7 July 2012.

1.17.5 The microlight was not registered with a valid AOC holder.

1.17.6 Information available after the accident indicated that the flight in question was one of many commercial flights carried out by the Pilot.

1.17.7 The last approved Manual of Procedure did not meet the regulatory requirements, as the manual did not address all requirements of the Civil Aviation Acts and Regulations. A draft Manual of Procedure was submitted to the SACAA however still required several changes and this was communicated via email.

1.17.8 The Aviation Training Organisation was re-audited on 30 November 2012 by a SACAA inspector after the renewal audit, as the Training Organisation had been suspended. The suspension was then lifted on 11 December 2012; however the SACAA had not yet issued a new Aviation Training Organisation certificate at the time of the accident. This was not the first time that the ATO operations had been suspended. It was previously suspended in 2001 and 2008 for non-compliance.

1.17.9 Previous enforcement action was taken against the pilot for illegal pleasure flights. The flight in question was one of many flights sold through an online marketing group. Payment is made online to the marketer and the company providing the service is then paid once the voucher has been redeemed. Passengers weighing above 99kg were informed via email that they would have to pay an extra fee.

1.17.10 The Quality System for the organisation was found lacking. The organisation did not have a suitably qualified Quality Assurance Manager. The Quality Assurance Manager listed in the MOP left South Africa in December of 2012 and there was no replacement at the time of the accident. There was also no approved internal audit schedule nor was there proof of internal audit reports having being carried out. As per documents found in the QA file, there should have been three internal audits carried out per year.

1.17.11 According to the SACAA, the Aviation Training Organisation only had one student on its books however a second training file was found (for the owner of the microlight that was involved in the accident).

1.17.12 The authorisation sheets found at the facility and used on the day of the accident reflected the incorrect aircraft registration. None of the authorisation sheets or documentation found at the facility had the registration of the aircraft involved in the accident.

1.18 Additional Information

1.18.1 The microlight was sold in 2012 and two months after purchasing the microlight the current owner was fatally injured in a motor bike accident. He had completed and signed the CAR47A (Application for registration of aircraft), but had not submitted the paperwork to the SACAA. As a result the aircraft was still registered on the previous owner's name.

1.18.2 The owner was also obtaining pilot training from the Aviation Training Organisation. He commenced with his training on 11 November 2012. He also received training on 17; 18 and 19 November 2012. According to his training file he received 11.25 hours of dual training on the 17th of November 2012. It is highly improbable that 11.25 hours of training was carried out on a microlight in a single day.

1.18.3 According the training file a student received 11.25 hours of dual training on the 17th of November 2012. Not only is this in contravention to CAR's 91.02.3 (3) (b) but also is it highly improbable that a training flight of this duration would have taken place.

CAR's 91.02.3 (3) states:-

"Flight crew member responsibilities

91.02.3

(3) No person shall act as a flight crew member of an aircraft if, prior to each flight, the expected flight time exceeds, or is likely to exceed, the permissible aggregate of —

(a) for all flying —

(i) for pilots not subject to an approved flight time and duty period scheme, 10 hours within a 24 hour period;

(b) in the case of flight instructors conducting ab initio or any training towards an initial rating or licence, six hours within one calendar day: Provided that, for the purposes of computing flight time in meeting the limitation referred to in paragraph (a) (i), each flight hour spent in such training shall be deemed to be one and one-half (1½) hours flight time;"

1.18.4 The wife of the deceased wanted to sell the aircraft after her husband's death and her nephew engaged the pilot who perished in the accident to find prospective buyers. He did not authorise the use of the aircraft for training or commercial purposes

1.18.5 Weight calculations

Empty weight	195 kg
Max fuel (50lt)	36 kg
Pilot	80 kg
Passenger	135 kg
Max all up weight (actual)	446 kg
Max all up weight (as per manual)	450 kg

NOTE

- The above weight calculation has been calculated without first aid kits, documents, side panniers, fire extinguisher and any other additional items as there is no proof of additional items that may have been onboard.

- The actual maximum all up weight as per the manual was extremely close to the actual maximum all up weight stipulated in the Aircraft Manual

1.18.6 The passenger and his brother (who was scheduled to fly on the next flight) wrote the incorrect weight on the flight authorisation sheet. They were concerned about the financial implications as they received an email prior to the flight notifying them that they would need to pay 50% of the ticket price to cover the extra fuel costs if they weighed more than 99kg. This however was not reflected on the voucher purchased for the flight.

1.18.7 Last entries in flight folio and aircraft logbook are dated 1 September 2012.

1.18.8 With reference being made to Figure 7, the photo clearly shows that the training bars were attached for the flight in question. These commercial flights were used as an Introduction Flight to acquire potential students for the Aviation Training School. Several witnesses confirmed that passengers did get the opportunity to take control of the aircraft once in the aircraft, if they so wished to do so.

1.18.9 According to the weather information obtained from the SA Weather Services and the Carburettor icing chart below icing could be a possibility as it falls in the serious icing at any power category. Carb icing would have resulted in an engine not functioning 100% (Refer to the black lines on the graph below).

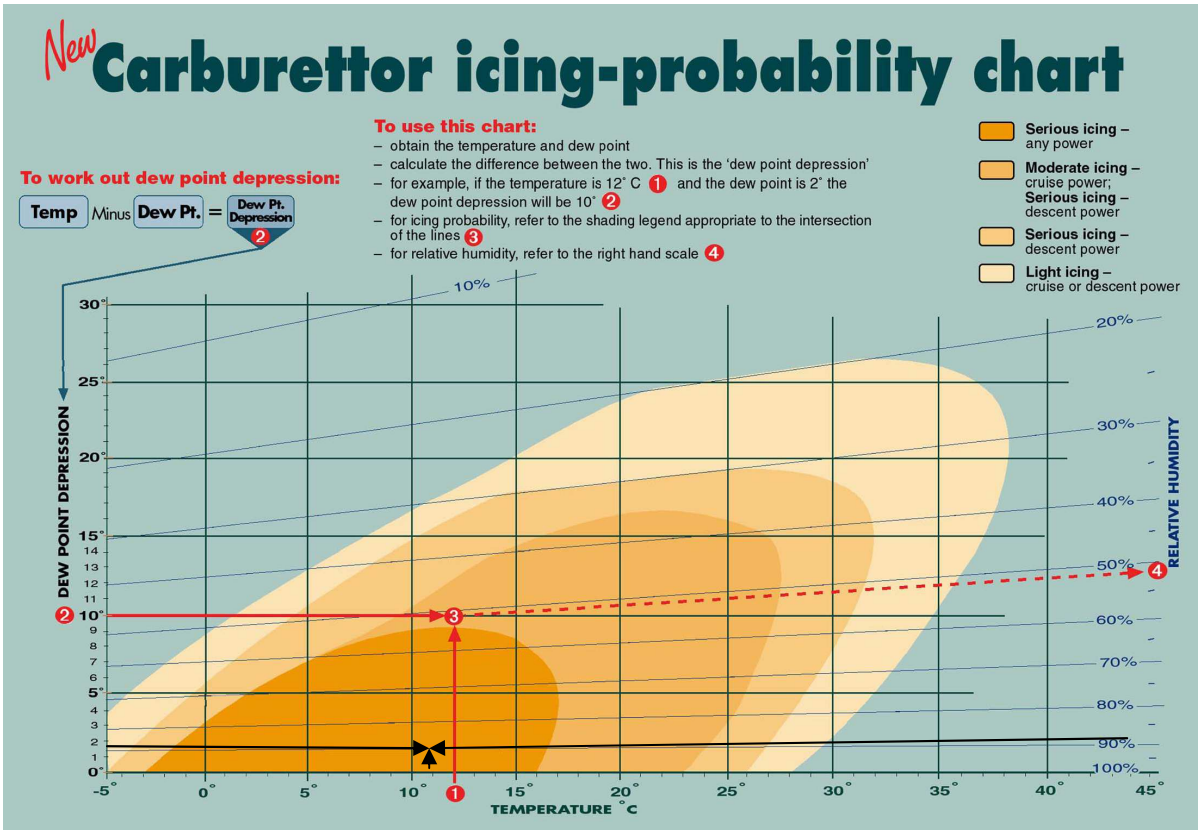

Figure 9: The Carburettor Icing-probability Chart

Temperature	11˚C
Humidity	90%
Dew-point	9.5 ˚C
Dew-point depression	1.5 ˚C

1.18.10. A fuel sample was taken from the jerry can used to uplift fuel on the morning of the accident. The fuel was of the proper grade and quality, and contained no contamination. The fuel / oil mixture was also found to be of an acceptable standard.

1.18.11. Several discrepancies were found in the pilot logbook. These discrepancies were neither picked up by the pilot's instructors or SACAA / RAASA when his license was issued, renewed and/or amended.

1.19 Useful or Effective Investigation Techniques

1.19.1 None.

2. ANALYSIS

2.1 Pilot

The pilot was the holder of a valid recreational pilot license at the time of the accident. The microlight type was endorsed in the pilot's license. The pilot was in possession of a valid medical certificate. The pilot's total flying experience on the Windlass Aquilla could not be determined with certainty as there was insufficient documented evidence to substantiate the

information, as well as several discrepancies that were found in the logbook. The last entry in the pilot's logbook was on 19 November 2012, a few months prior the accident flight.

2.2 Aircraft

Due to the post impact fire that had consumed the aircraft it was not possible to gain any evidence from the cockpit area. It was also not possible to correlate the carburettor piston position to the throttle settings at the time of the accident. The possibility could not be excluded that for some reason the pilot did experience an engine problem and attempted a restart of the engine.

The ground impact marks indicates the aircraft collided wheels first with the ground. The remains of the aircraft were found in close proximity to the wreckage.

No records could be found indicating if there was any fuel uplifted but there is a witness who saw the microlight being refuelled before the flight. The witness stated that the aircraft was refuelled to a maximum capacity.

An engine strip was carried out and the general overview of the engine determined that the engine was running at a fairly high RPM on impact, as all three propeller blades were broken off near the root at the hub of the propeller. The gearbox showed no damage was sustained. Severe carbon build up found on the pistons of the engine could be an indication of a rich mixture, possibly flown with the choke being partially open.

The airworthiness of the microlight is in question, as maintenance records were last updated in November 2012; therefore it is not known whether the microlight had any snags when dispatched for the flight.

The Quality System for the organisation was found lacking. The organisation did not have a suitably qualified Quality Assurance Manager. The Quality Assurance Manager listed in the MOP left South Africa in December of 2012 and there was no replacement at the time of the accident. There was also no approved internal audit schedule nor was there proof of internal audit reports having being carried out. As per documents found in the QA file, there should have been three internal audits carried out per year but the schedule was not adhered to.

Unfortunately the SACAA oversight of the pilot and his organisation was found lacking. The pilot was allowed to continue operating his Training School despite not fully complying with the Regulations during his last audit. Several non-conformances were not fully addressed in terms of the regulations and the Aviation Training Organisation was reinstated after the upliftment of the suspension.

2.3 Environment

The accident flight was conducted in excellent flying conditions. It is believed the weather conditions that prevailed on the morning had no effect on the accident. There was ample level and open area surrounding the accident site for the microlight to do an emergency landing if it was necessary. There are no powerlines in close proximity, but there is a row of

tall gumtrees that run behind the hangars parallel to the accident site. The gumtrees could have been the only obstacle that could have possibly created a hindrance to the aircraft.

3. CONCLUSION

3.1 Findings

3.1.1 The aircraft did not have a valid Certificate of Registration, as it was not registered with SACAA under the new owner's name.

3.1.2 The aircraft did not have a valid Authority to Fly, as an application had not been made to RAASA for it.

3.1.3 The Aviation Training Organisation was not in possession of a valid ATO Approval certificate at the time of the accident. The certificate found at the facility had an expiry date of 7 July 2012.

3.1.4 The organisation carried out commercial work but was not in possession of an Aircraft Operating Certificate (AOC).

3.1.5 The aircraft was not registered with a valid AOC holder.

3.1.6 The aircraft was not certified and maintained in accordance with existing regulations and approved procedures after the last change of ownership, and were therefore not consider airworthy.

3.1.7 The aircraft was also used for training purpose on several occasions as stated by the Pilot's Personal Assistant. There was no documented evidence of flights carried out on this aircraft. On the flight in question, training bars were fitted to the aircraft and were found in the wreckage.

3.1.8 The only paperwork found at the facility was the indemnity forms, proof of payment for the flights and authorisation sheets. The authorisation sheets however reflected the incorrect aircraft registration.

3.1.9 No evidence could be found to verify if any defect or malfunction could have contributed to the accident.

3.1.10 The aircraft was structurally intact prior to impact.

3.1.11 All control surfaces were accounted for, and the aircraft was destroyed by the severe impact forces and post-impact fire.

3.1.12 Propeller blade damage and twist was consistent with the engine producing power at impact.

Figure 10: The Propeller

3.1.13 The fuel sample taken did not contain any contamination.

3.1.14 The pilot was licensed and qualified for the flight in accordance with existing regulations.

3.1.15 The organisation was not in possession of an Approved Training Procedures Manual. The flight was not conducted in accordance with the procedures in the company Operations Manual, as the organisation was not approved to carry out Commercial flights.

3.1.16 The organisation did not have a suitable Quality Assurance Manager and no proof of internal audits could be found.

3.1.17 After the uplift of the suspension of the ATO on 11 December 2012, the SACAA had not yet issued a new ATO certificate at the time of the accident.

3.1.18 Several discrepancies were found in the pilot's logbook. These discrepancies were neither picked up by the pilot's instructors or SACAA / RAASA. The pilot's license was processed without proper examination of documentation submitted for his license, when it was issued, renewed and/or amended.

3.1.19 Oversight on the pilot and his organization by the SACAA was inadequate.

3.1.20 The SACAA's monitoring system had been ineffective in identifying and making the operator correct the procedural lapses. His organisation was suspended and then the suspension was lifted without full compliance on his part.

3.1.21 No reason for the accident supported by actual evidence could be found.

3.2 Probable Cause/s

3.2.1 Undetermined

4. SAFETY RECOMMENDATIONS

4.1 “It is recommended to South Africa that once enforcement action has been taken against an individual and/or organisation, SACAA should carry out monthly oversight to ensure that the individual and/or organisation is complying fully with the regulations.

4.2 “It is recommended to the Director of Civil Aviation that further investigation be carried out into the maintenance of microlight aircraft used for commercial and/or training purposes. The regulations state that these aircraft should be maintained by an Aircraft Maintenance Engineer working under an Approved Aircraft Maintenance Organisation approval, whoever this is not the case. The current regulations pertaining to NTCA aircraft are extremely ambiguous and it is strongly recommended that the regulations for NTCA aircraft are reviewed and amended with more stringent requirements. RAASA is acting in contravention to the regulations as they allow an Approved Person to carry out the maintenance irrespective of whether they are associated with an Aircraft Maintenance Organisation or not.

4.3 “It is recommended to the Director of Civil Aviation that massive disconnect between the SACAA and RAASA in terms of Non-type Certified Aircraft Is seriously addressed. A definitive line needs to be drawn regarding the certification, maintenance and use of Non-type Certified Aircraft. Having two bodies regulate this sector of the industry has created a gap for non-compliance.

5. APPENDICES

5.1 None.