SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Section/division **Accident and Incident Investigations Division** Form Number: CA 12-12a

AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/9528		
Aircraft Registration	**ZU-EFO**	**Date of Accident**	13 March 2016		**Time of Accident**	1530Z	
Type of Aircraft	Ela-08 Gyrocopter		**Type of Operation**		Private (Part 91)		
Pilot-in-command Licence Type		National Pilot License	**Age**	46	**Licence Valid**	Yes	
Pilot-in-command Flying Experience		Total Flying Hours	unknown		Hours on Type	unknown	
Last point of departure	Ellisras Airport (FAER), Lephalale, Limpopo Province						
Next point of intended landing	Ellisras Airport (FAER), Lephalale, Limpopo Province						
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)							
On the private farm, Fancy Farm in the Lephalale area approximately 17km from Lephalale Aerodrome (GPS coordinates: S23°52'38.44" E27°38'47.01")							
Meteorological Information	Temperature: 29ºC; Dew point: 21ºC; Wind 240º/01 kt; Visibility: 10 000 m; Cloud Cover: None						
Number of people on board	1+1	**No. of people injured**	0		**No. of people killed**	2	

Synopsis

On Sunday, 13 March 2016 the pilot accompanied by a passenger conducted a private flight in Lephalale area, Limpopo Province. The aircraft was seen by witnesses flying low and fast, approximately two metres above the water's surface over the length of a dam.

The aircraft was then seen impacting a zip line cable which spanned across the dam where after the pilot lost control of the aircraft and the aircraft then crashed to the ground.

An explosion was heard after the crash and a post impact fire ensued which destroyed the wreckage. Both occupants on board the aircraft sustained fatal injuries during the accident sequence.

Probable Cause

The aircraft impacted a zip line cable where after the pilot lost control of the aircraft and it crashed to the ground.

Contributing Factor/s

1. Low flying
2. Disregard for safe operating procedures

SRP Date		Release Date	

AIRCRAFT ACCIDENT REPORT

Name of Owner	**:**	D. Du Plessis
Name of Operator	**:**	Private
Manufacturer	**:**	Ela Aviacion
Model	**:**	Ela-08
Nationality	**:**	South African
Registration Marks	**:**	ZU-EFO
Place	**:**	Lephalale, Limpopo Province
Date	**:**	13 March 2016
Time	**:**	1530Z

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 produced without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION

1.1 History of Flight

1.1.1 On Sunday, 13 March 2016 the pilot and a passenger took off from Ellisras Airport (FAER) in Lephalale, Limpopo Province, with the intention of conducting a private flight in the area and then landing back at Ellisras Airport. Witnesses who were sitting on the sundeck of a guest lodge next to the dam saw the aircraft flying past them low and fast, approximately two metres above the water's surface.

1.1.2 The aircraft was seen flying over the length of a dam situated on the private farm, Fancy Farm in the Lephalale area. The left side of the dam was lined with trees and a mountain ridge was lining the right side of the dam. The unobstructed flight path width was 10 metres at the narrowest part and 35 metres at the widest section. Three other witnesses who were busy fishing at the dam stated that the aircraft was flying low and fast, approximately two metres above the water's surface when it impacted the zip line cable which spanned across the dam. The pilot then lost control of the aircraft where after it crashed into a bushy terrain on the farm.

1.1.3 After the crash the witnesses heard an explosion where after a post impact fire ensued. The three witnesses who were also the first responders to the accident got

hold of buckets and filled it with water from the dam and extinguished the fire. Both occupants on board the aircraft sustained fatal injuries during the accident sequence. The accident occurred at the GPS position: S23°52'38.44" E27°38'47.01".

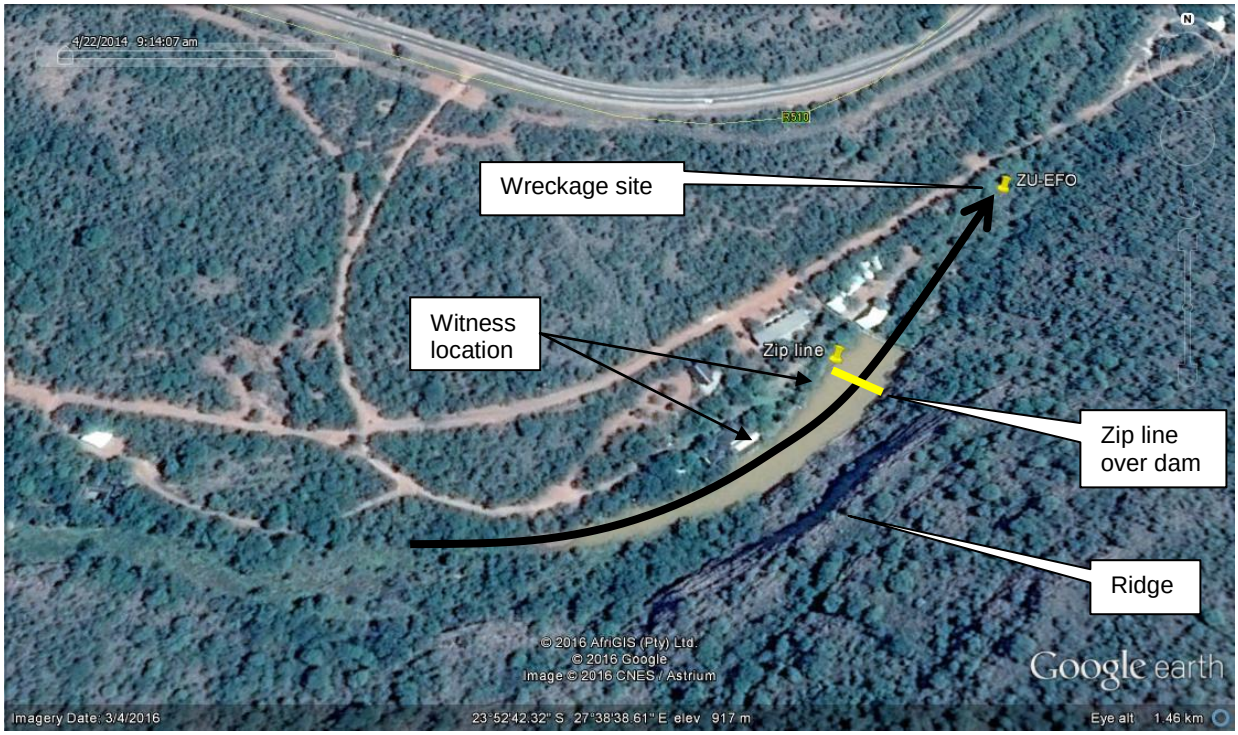

Figure 1: View of aircraft flight path

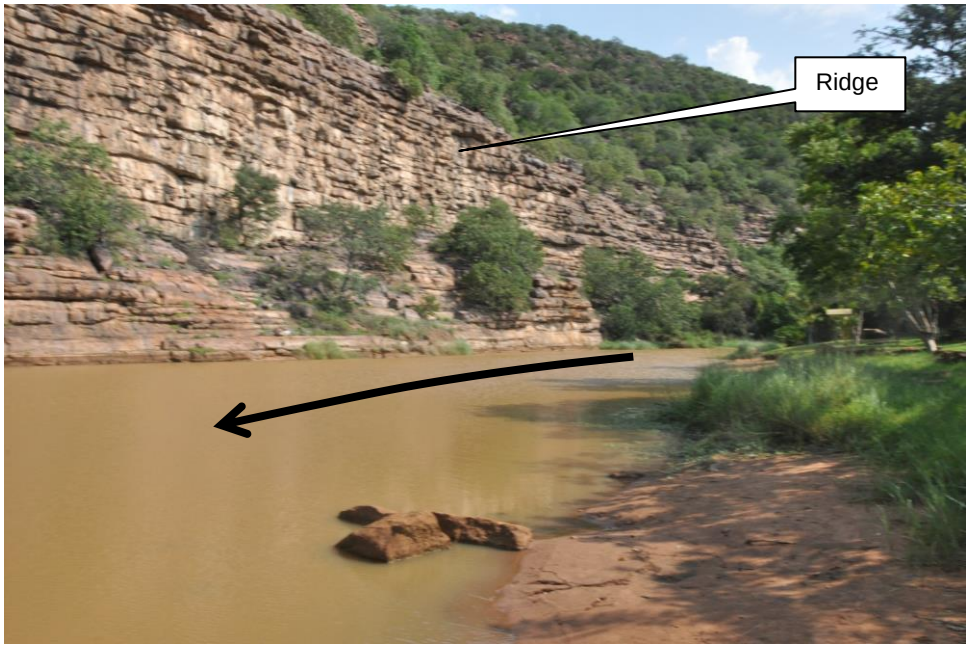

Figure 2: View of aircraft flight path

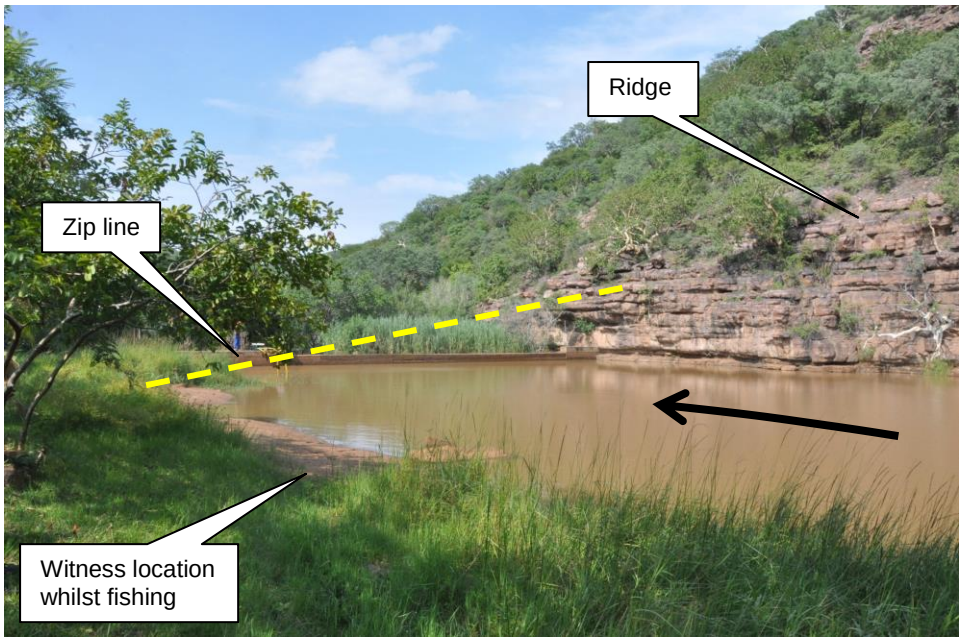

Figure 3: View of aircraft flight path and zip line

Figure 4: View of where the witnesses were sitting when the aircraft flew pass

1.2 Injuries to Persons

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

1.3 Damage to Aircraft

1.3.1 The aircraft was destroyed during the accident.

Figure 5: View of aircraft wreckage

1.4 Other Damage

1.4.1 The vegetation in area where the aircraft crashed burnt and a zip line was damaged.

Figure 6: The zip line cable that the aircraft impacted

1.5 Personnel Information

Nationality	South African	Gender	Male	Age	46
Licence Number	0271004350	Licence Type	National Pilot		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Conventionally Controlled Microlight; Gyroplane				
Medical Expiry Date	30 April 2017				
Restrictions	None				
Previous Accidents	None				

Flying Experience:

Total Hours	122
Total Past 90 Days	unknown
Total on Type Past 90 Days	unknown
Total on Type	unknown

Note: 1. The pilot's logbook was unavailable at the time this report was compiled.
2. The last hours that were retrieved from RAASA records was dated 08 November 2015.
3. The pilot's last annual flight renewal test was done on 08 November 2015.

1.6 Aircraft Information

1.6.1 Airframe:

The ELA-08 is a two-seat tandem semi-enclosed gyrocopter with two windscreens and room for two travelling bags. The main frame is made with stainless steel tubes and designed and tested to support 5 Gs loads with maximum weight at take-off. The rotor control system is also made of stainless steel and is duplicated to be able to pilot from both seats. The autogyro's cabin and tail unit is manufactured in carbon fibre and epoxy resin.

A gyrocopter has a rotor as a wing which, when rotating, provides both lift to keep the aircraft airborne and an aerodynamic autorotative force which actually drives the blades around.

Figure 7: Photo of a similar gyrocopter as taken from internet

Type	Ela-08	
Serial Number	96	
Manufacturer	Ela Aviacion	
Date of Manufacture	2006	
Total Airframe Hours (At time of Accident)	Unknown	
Last MPI (Hours &Date)	630.3	02 March 2015
Hours since Last MPI	Unknown	
Authority to Fly (Issue Date)	05 March 2015	
Authority to Fly (Expiry Date)	06 March 2016	
C of R (Issue Date) (Present owner)	22 February 2014	
Previous Accidents	None	

Note: 1. The last flight recorded in the aircraft documentation was on 02 March 2015.
2. The Hobbs meter was destroyed during the accident.
3. The last annual documented Authority-to-Fly document was obtained from RAASA. The last Authority-to-Fly inspection was certified on 05 March 2015 at 630.3 airframe hours

1.6.2 Engine:

Type	Rotax 914 UL
Serial Number	4419218
Hours since New	591.26
Hours since Overhaul	591.26

Note: 1. The hours above was taken from the last recorded flight in the aircraft documentation on 02 March 2015.
2. The Hobbs meter was destroyed during the accident.

1.6.3 Rotor:

Type	Duc
Serial Number	2061
Hours since New	591.26
Hours since Overhaul	591.26

Note: 1. The hours above was taken from the last recorded flight in the aircraft documentation on 02 March 2015.
2. The Hobbs meter was destroyed during the accident.

1.6.4 Fuel

The fuel tank ruptured on impact with the ground and a post impact fire ensued. The 75 litre fuel tank is located under the aft seat. No documentation was available to calculate the uplifted fuel or the remaining fuel in the tank.

1.6.5 Weight and Balance

Basic Empty Mass	240 kg
Pilot	103 kg
Passenger	97 kg
Fuel	50 kg
Cargo	
Total Weight	490 kg
Maximum Take-off & Landing Weight	550 kg

Below Maximum Take-off Weight	60 kg

Note: The fuel was calculated with 70 litres on board.
The total weight of the aircraft was within limits for the flight and was determined to be 60 kg below the maximum take-off weight limit and maximum landing weight limit of the aircraft.

1.7 Meteorological Information

1.7.1 The following information was obtained from the official report by the South African Weather Services (SAWS):

1) Surface observations
Parys is not a SYNOP station so Lephalale (FAER) was used for surface data.

METARs
Station: FAER

FAER 131500Z AUTO 24001KT //// // ////// 29/21 Q1017=
FAER 131600Z AUTO 18001KT //// // ////// 28/23 Q1017=

The surface observations have no cloud information as this station is not manned, but all the information indicates that the conditions at the surface were relatively calm with wind speeds not exceeding two knots.

2) Satellite Image

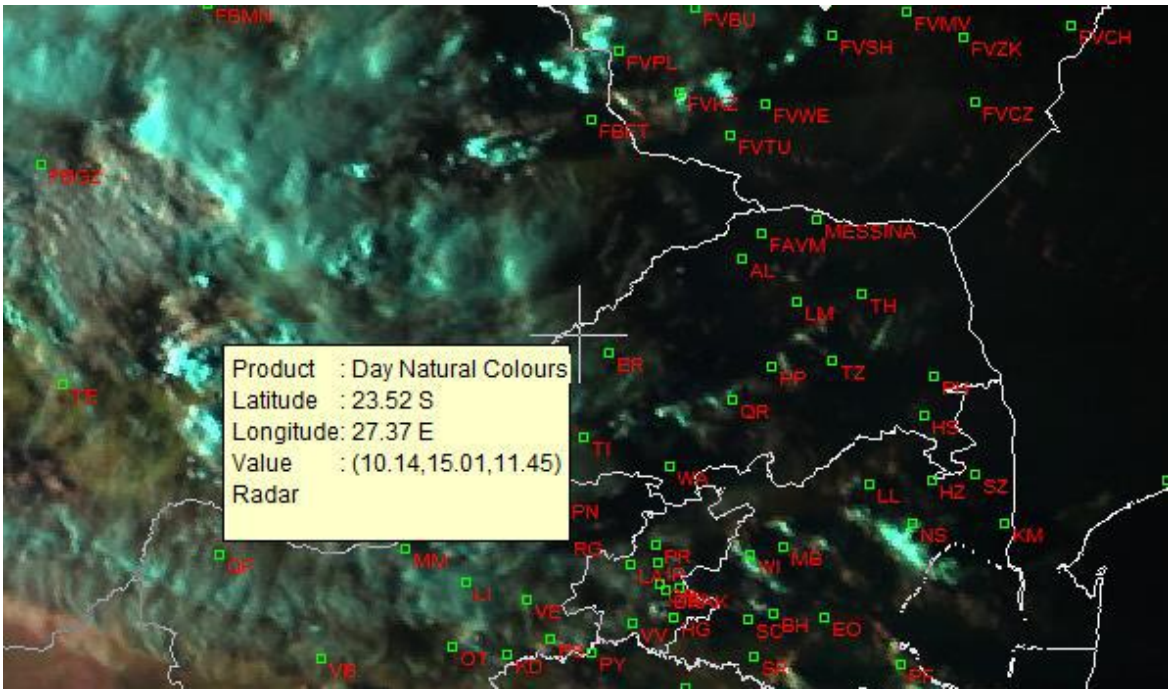

Figure 8: Satellite image of the weather in the area

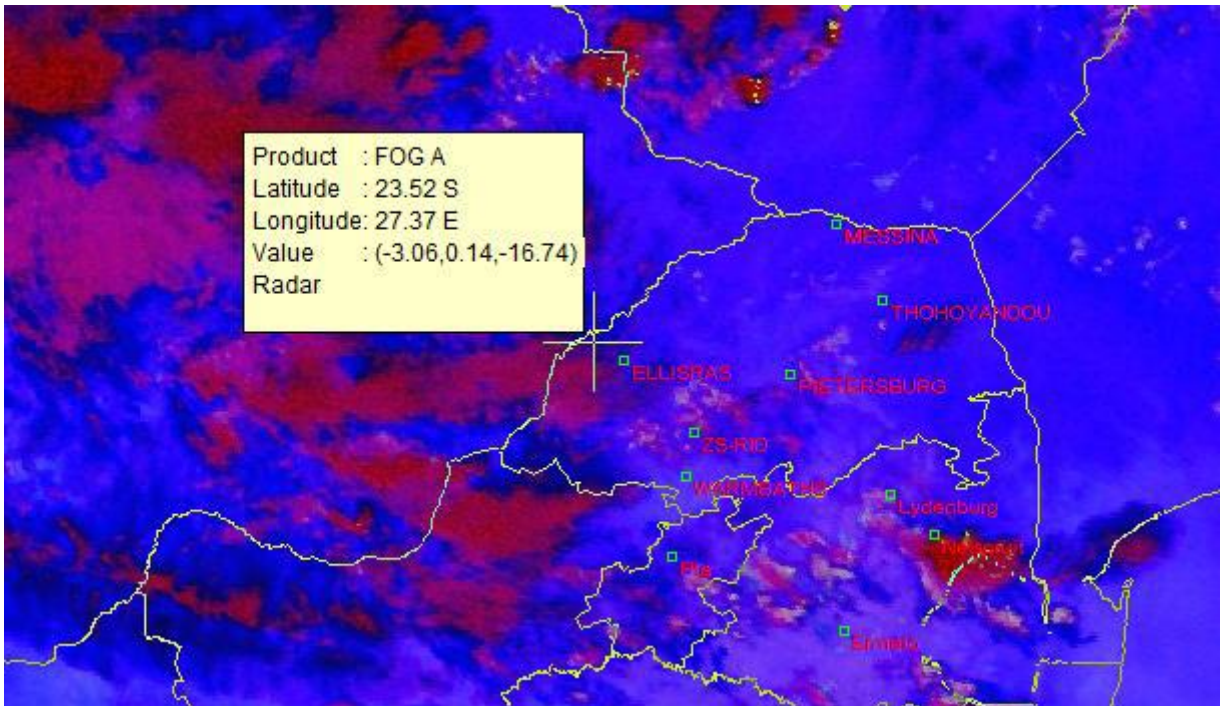

Figure 9: Satellite image of the weather in the area

The cross on the above satellite images indicates the GPS position of the accident scene (both images are valid for 16H00 UTC). It can be seen that there were active thunderstorms over south eastern Botswana during this time. No active thunderstorm is visible at the accident site, although it looks like a thunderstorm dissipated to the south west not long ago. The proximity of this decaying thunderstorm to the accident site could've caused turbulence in the area as the updraft within the cell "collapsed", possibly causing a strong downdraft. No low cloud is visible in the satellite images (the surface observations support this).

1.8 Aids to Navigation

1.8.1 The aircraft was equipped with approved navigational aids. No defects to the navigational equipment were reported or recorded prior to the accident flight.

1.9 Communications

1.9.1 The aircraft was equipped with the approved communications equipment. No defects to the communication equipment were reported or recorded prior to the accident flight.

1.10 Aerodrome Information

1.10.1 The aircraft accident occurred approximately 17km outside the boundaries of Ellisras Airport on the private farm, Fancy Farm in the Lephalale area. The GPS coordinates of the accident site position are S23°52'38.44" E27°38'47.01".

1.11 Flight Recorders

1.11.1 The aircraft was not fitted with a cockpit voice recorder (CVR) or a flight data recorder (FDR), nor was this required by regulations.

1.12 Wreckage and Impact Information

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1.12.1 The aircraft was seen flying over a farm dam in a north easterly direction at approximately two metres above the water's surface when it impacted a zip line cable which spanned across the dam. The aircraft then crashed into a bushy terrain on the private farm.

1.12.2 The wreckage path indicated that after the aircraft impacted the zip line cable, it crashed into tree tops and to the ground approximately 180 metres from the zip line cable.

Figure 10, Zip line cable position image

1.12.3 The fuselage including landing gear and fuel tank was destroyed by a post-impact fire. The engine was also partially burnt by the post-impact fire. The tail of the aircraft was found approximately 4 metres from the main wreckage. The damage on the propeller indicated impact with the zip line cable. Propeller blade damage was consistent with the engine producing power at impact.

1.13 Medical and Pathological Information

1.13.1 The two bodies were recovered to Forensic Pathology Unit, Mokopane Hospital for examinations on. Both bodies were examined by the qualified doctor. The conclusion results on both bodies is that the causes of death were as a result of multiple severe traumatic injuries following the plane crash.

1.14 Fire

1.14.1 Immediately after the impact with the ground an explosion was heard by witnesses and a post impact fire ensued. The wreckage was destroyed by the post impact fire.

1.15 Survival Aspects

1.15.1 The accident was not considered survivable due to the magnitude of the deceleration forces experienced when the aircraft impacted the ground surface.

1.15.2 Although the occupants on board the aircraft were secured by the aircraft's seatbelts, the seatbelts broke out of their attachments due to the magnitude of the accident during the impact sequence.

1.16 Tests and Research

1.16.1 None

1.17 Organizational and Management Information

1.17.1 As no aircraft documentation were available, the last annual documented Authority-to-Fly document was obtained from RAASA. The last Authority-to-Fly inspection was certified on 05 March 2015 at 630.3 airframe hours by an Aero Club approved person (AP) who was in possession of a valid AP certificate.

1.17.2 This was a privately owned aircraft and was privately operated.

1.18 Additional Information

1.18.1 None

1.19 Useful or Effective Investigation Techniques

1.19.1 Not required.

2. ANALYSIS

2.1 On Sunday, 13 March 2016 the pilot accompanied by a passenger conducted a private flight in Lephalale area, Limpopo Province. The aircraft was seen by witnesses flying low and fast, approximately two metres above the water's surface

over the length of a dam.

2.2 The length of a dam was lined with trees on the left side and a mountain ridge was lining the right side of the dam. Witnesses saw the aircraft impacting a zip line cable which spanned across the dam. Damage on the propeller indicated that the propeller impacted the zip line cable at full engine power where after the pilot lost control of the aircraft. The aircraft then crashed to the ground approximately 180 metres from the zip line cable.

2.3 After the crash an explosion was heard and a post impact fire ensued which destroyed the wreckage. Both occupants on board the aircraft sustained fatal injuries during the accident sequence.

3. CONCLUSION

3.1 Findings

3.1.1 The pilot was the holder of a valid national pilot licence and had the aircraft type endorsed on his licence.

3.1.2 The pilot was the holder of a valid aviation medical certificate issued by an approved medical examiner.

3.1.3 The Authority to Fly of the aircraft was not valid.

3.1.4 There was sufficient fuel on board the aircraft at the time of the accident.

3.1.5 The weight and balance of the aircraft were below the maximum allowable limits for the aircraft.

3.1.5 All control surfaces were accounted for, and all damage to the aircraft was attributable to the severe impact forces.

3.1.6 There was no evidence of any defect or malfunction in the aircraft that could have contributed to the accident.

3.1.7 Propeller blade damage was consistent with the engine producing power at impact.

3.1.8 The aircraft was seen by witnesses flying approximately two metres above the water's surface when it impacted a zip line cable which spanned across the dam. The aircraft then crashed into the ground.

3.1.9 An explosion was heard by witnesses after the impact with the ground and a post impact fire ensued. The wreckage was destroyed by the post impact fire.

3.1.10 Fine weather conditions prevailed, which were not considered to have had any bearing on the accident.

3.2 Probable Cause/s

3.2.1 The aircraft impacted a zip line cable where after the pilot lost control of the aircraft and it crashed to the ground.

3.3 Contributory Factor/s:

3.3.1 Low flying

3.3.2 Disregard for safe operating procedures

4. SAFETY RECOMMENDATIONS

4.1 None

5. APPENDICES

5.1 None.