AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:		CA18/2/3/9970	
Aircraft Registration	ZU-CPJ	**Date of Accident**	17 March 2021			**Time of Accident**	0650Z
Type of Aircraft	Windlass Aquilla Trike			**Type of Operation**		Training (Part 141)	
Pilot-in-command Licence Type	National Pilot Licence (NPL)			**Age**	58	**Licence Valid**	Yes
Pilot-in-command Flying Experience		**Total Flying Hours**		21 826		**Hours on Type**	105.8
Last Point of Departure	Ballito Airfield, KwaZulu-Natal Province						
Next Point of Intended Landing	Ballito Airfield, KwaZulu-Natal Province						
Damage to Aircraft	Destroyed						

Location of the accident site with reference to easily defined geographical points (GPS readings if possible)

Skyland sugarcane farm, north-east of Ballito Airfield at Global Positioning System (GPS) co-ordinates determined to be 29°29'11.14" South 31°10'53.93" East at an elevation of 230 feet (ft)

Meteorological Information	Wind direction: 100°; Wind speed: 4kts; Temperature: 22°C; Cloud Cover: Few; Cloud Base: 3 800ft; Visibility: 9 999m; QNH: 1013hPa

Number of People On-board	1+1	**Number of People Injured**	0	**Number of People Killed**	2	**Other (On Ground)**	0

Synopsis

On Wednesday morning, 17 March 2021, the pilot and the passenger on-board a Windlass Aquilla Trike (microlight) aircraft with registration ZU-CPJ took off on an introductory flight from Runway 08 at Ballito Airfield in KwaZulu-Natal (KZN) province with the intention to land at the same airfield. The flight was conducted under visual flight rules (VFR) by day and under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011 as amended. Clear weather conditions prevailed at the time of the flight.

The approved training organisation (ATO) representative reported that the first flight was at approximately 0510Z in the morning with the flight instructor and the student pilot on-board. The flight, which lasted 30 minutes, was uneventful. The second flight, which was an introductory flight at 0610Z with the instructor and an ab-initio student pilot (passenger) on-board, was also scheduled to last approximately 30 minutes. The aircraft did not return to the airfield after 30 minutes as scheduled. The ATO representative initiated a search for the missing aircraft. The aircraft wreckage was located on Skyland sugarcane farm near Ballito Airfield, approximately 624 metres (m) north-east of the airfield. The aircraft was destroyed and both occupants were fatally injured.

Post-accident inspection of the engine and components did not reveal any signs of malfunction before the accident. The damaged propeller blades indicated that the engine was producing maximum power at the time of the accident. The foot throttle and brake assembly cables and linkages were intact, the control cables were not frayed or broken and their continuity was found to be satisfactory. Damage observed on the control cables was caused by impact. The carburettor bowls contained sufficient fuel and approximately 35 litres of 95 Octane Unleaded (Automotive) fuel. The microlight was fitted with training bars. It is not known who was on the controls at the time of this accident.

Probable Cause/s and/or Contributory Factors

It is likely that the pilot lost control of the microlight during the flight which resulted in the microlight impacting the ground in a steep nose-down attitude at a distance of approximately 624m north-east of the extended centreline of Runway 08. The cause of loss of control could not be determined.

SRP Date	14 February 2023	Publication Date	20 February 2023

Occurrence Details

Reference Number	**:** CA18/2/3/9970
Occurrence Category	**:** Category 1
Type of Operation	**:** Training (Part 141)
Name of Operator	**:** Ballito Microlight School
Aircraft Registration	**:** ZU-CPJ
Aircraft Make and Model	**:** Windlass Aquilla Trike
Nationality	**:** South African
Place	**:** Ballito Airfield, approximately 624 m northeast of the airfield
Date and Time	**:** 17 March 2021 at 0650Z
Injuries	**:** Fatal
Damage	**:** Destroyed

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 apportion blame or liability.

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.

Investigation Process

The Accident and Incident Investigations Division (AIID) of the South African Civil Aviation Authority (SACAA) was notified of the occurrence on 17 March 2021 at 0800Z. The occurrence was classified as an accident according to the CAR 2011 Part 12 and ICAO STD Annex 13 definitions. The notification was sent to the State of Registry/Operator in accordance with the CAR 2011 Part 12 and ICAO Annex 13 Chapter 4. Investigators were dispatched to the accident site for this occurrence.

Notes:

1. *Whenever the following words are mentioned in this report, they shall mean the following:*
   Accident — this investigated accident
   Aircraft — the Windlass Aquilla Trike 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 were taken from different sources and may have been adjusted from the original for the sole purpose of improving the clarity of the report. Modifications to images used in this report were limited to cropping, magnification, file compression; enhancement of colour, brightness, contrast; or addition of text boxes, arrows, or lines.*

Disclaimer

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Abbreviation	Description
°	Degrees
°C	Degrees Celsius
A/C	Aircraft
AGL	Above Ground Level
AIID	Accident and Incident Investigations Division
AMO	Aircraft Maintenance Organisation
AMSL	Above Mean Sea Level
AP	Approved Person
ATF	Authority to Fly
ATO	Approved Training Organisation
CAA	Civil Aviation Authority
CAR	Civil Aviation Regulations
C of A	Certificate of Airworthiness
C of R	Certificate of Registration
CRS	Certificate of Release to Service
CPL	Commercial Pilot License
E	East
ELEV	Elevation
FDR	Flight Data Recorder
FPM	Feet Per Minute
ft	Feet
GPS	Global Positioning System
hPa	Hectopascal
IIC	Investigator-in-charge
IOC	Investigator-on-call
KM	Kilometres(s)
kt	Knots
m	Metres
METAR	Meteorological Aeronautical Report
N/A	Not Applicable
NM	Nautical Mile
Q	Quart(s)
QNH	Query: Nautical Height
RWY	Runway
S	South
SACAA	South African Civil Aviation Authority
SAWS	South African Weather Service
UTC	Co-ordinated Universal Time
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
Z	Zulu (Term for Universal Co-ordinated Time - Zero Hours Greenwich)

1. FACTUAL INFORMATION

1.1. History of Flight

1.1.1 On Wednesday morning, 17 March 2021, the pilot and the passenger on-board a Windlass Aquilla Trike aircraft with registration ZU-CPJ took off from Runway 08 at Ballito Airfield, KwaZulu-Natal (KZN) province with the intention to return to the same airfield. The flight, which was an introductory flight, was conducted under visual flight rules (VFR) by day and under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011 as amended. Clear weather conditions prevailed at the time of the flight.

1.1.2 The approved training organisation (ATO) stated that there were two scheduled flights on the morning of 17 March 2021; each flight was planned to last about 30-35 minutes. The first flight was a scenic flight, and the second was an introductory flight. The ATO stated that an introductory flight was conducted for a potential customer/student pilot who showed an interest in microlight flying. The ATO further reported that the first flight was at approximately 0510Z with the flight instructor and a student pilot (a different person). The flight was uneventful and lasted approximately 30 minutes. After landing, the flight instructor and the student pilot disembarked from the aircraft and made their way to the hangar to fetch the passenger who had already signed an indemnity form and had also been briefed.

1.1.3 The ATO representative reported that the second flight started at approximately 0610Z. The aircraft did not return after 30 minutes as scheduled and a search for the missing aircraft was initiated by the ATO using another microlight. The wreckage was located on Skyland sugarcane farm approximately 624 metres (m) north-east of the airfield by the search party.

1.1.4 The ATO notified the Emergency Medical Services (EMS) and the South African Police Service (SAPS) who swiftly responded to the accident scene. The medical officials reported that they found the destroyed microlight with the pilot and the passenger restrained in their respective seats. They had both succumbed to their injuries. The deceased were later recovered by the pathologist and transported to KwaDukuza, north-east of Durban in KwaZulu-Natal province.

1.1.5 During the post-accident interview with the spouse of the passenger, she stated that they were on vacation at Ballito when they came across a flyer that advertised scenic flights along Ballito beach. The deceased passenger enquired about the advertisement. During the investigation, it was discovered that the passenger completed an indemnity form in line with the ATO's Manual of Procedure (Annexure A).

1.1.6 A bank statement of the passenger was shared with the investigating team, and it reflected that a payment was made by the passenger for the flight, however, no ticket was issued, but a signed indemnity form was shared with the investigators.

1.1.7 A 51-second video footage that was taken by the passenger who was seated behind the pilot during taxi was also shared with the investigating team. At the start of the video, *the microlight is seen taxiing near the hangars to line up for take-off on Runway 08. The high and low revolution per minute (rpm) engine sound is heard which could be due to different throttle inputs*. This continued until the microlight lined up for Runway 08, which is the end of the video recording.

1.1.8 The accident occurred during daylight at Skyland sugarcane farm, north-east of Ballito Microlight School at Global Positioning System (GPS) co-ordinates determined to be 29°29'10.14" South 31°10'53.93" East, at an elevation of 230 feet (ft).

Figure 1: The accident location. (Source: Google Earth)

1.2. Injuries to Persons

Injuries	Pilot	Crew	Pass.	Total On-board	Other
Fatal	1	-	1	2	-
Serious	-	-	-	-	-
Minor	-	-	-	-	-
None	-	-	-	-	-
Total	1	-	1	2	**-**

Note: Other means people on the ground.

1.3. Damage to Aircraft

1.3.1. The aircraft was destroyed during the accident sequence.

Figure 2: The final resting position of the microlight at the site.

1.4. Other Damage

1.4.1. Some sugarcane crops were damaged during the accident.

Figure 3: Damaged sugarcane crops.

1.5. Personnel Information

Nationality	South African	Gender	Male	Age	58
Licence Type	National Pilot Licence (NPL)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	WCM Instructor Grade C				
Medical Expiry Date	31 October 2022				
Restrictions	Suitable Corrective Lenses				
Previous Accidents	None				

Note: Previous accidents refer to past accidents the pilot was involved in, when relevant to this accident.

Flying Experience:

Total Hours	21 826
Total Past 24 Hours	0.5
Total Past 7 Days	0.5
Total Past 90 Days	9.7
Total on Type Past 90 Days	9.7
Total on Type	105.8

Note: The hours depicted above were recorded during the renewal of the pilot's licence on 27 January 2021.

1.5.1. The pilot was initially issued a Commercial Pilot Licence (CPL) on 2 December 1994. His last licence revalidation was carried out on 27 January 2021 with an expiry date of 26 January 2023. The pilot was issued a National Pilot Licence on 26 June 2020 with an expiry date of 25 June 2021.

1.5.2. The pilot was issued a Class 4 aviation medical certificate on 26 June 2020 with an expiry date of 31 October 2022.

1.5.3. According to the ATO, the passenger was a potential client who wanted to undertake microlight flight training. However, at the time of the accident, he was neither registered with the Regulator (SACAA) nor did he have a medical certificate issued in terms of the CAR 2011. Also, there was no student file opened for him by the ATO.

1.5.4. According to the pilot's logbook, the pilot only flew 9.7 hours.

1.6. Aircraft Information

1.6.1. The aircraft, a Windlass Aquilla Trike, was manufactured in South Africa in 2002 by Solo Wings CC. It was powered by a Rotax engine with 64 horsepower and a capacity of 50 litres (l) of fuel. The microlight was fitted with a single Bombardier Rotax 582 engine in a pusher configuration, driving a Warp Drive propeller. It featured a cable-braced hang glide-style high-wing, weight-shift controls, two seats in tandem open cockpit, tricycle landing gear and a steerable nose wheel made from tubing, with the wing covered in Dacron sailcloth.

Airframe:

Manufacturer/Model	Solo Wings CC, Windlass Aquilla Trike	
Serial Number	WA 943	
Year of Manufacture	2002	
Total Airframe Hours (At Time of Accident)	2797.3	
Last Inspection (Date & Hours)	7 March 2021	2773.7
Airframe Hours Since Last Inspection	23.6	
CRS Issue Date	30 December 2021	
ATF (Issue Date & Expiry Date)	6 January 2020	31 January 2022
C of R (Issue Date) (Present Owner)	16 March 2021	
Operating Category	Training (Part 141)	
Type of Fuel Used	Octane 95 unleaded fuel (Automotive)	
Previous Accidents	On 18 December 2015, the aircraft was involved in a forced landing accident at Salt Rock beach, North Coast, in KwaDukuza KwaZulu-Natal province. This accident was neither reported to the AIID nor the SACAA.	

Note: Previous accidents refer to past accidents the aircraft was involved in, when relevant to this accident.

1.6.2 **Duties of PIC regarding flight operations as per CAR 2011 Part 91.02.8 (subpart 4g)**

A PIC of an aircraft shall—

(g) report any accident or incident involving an aircraft in accordance with Part 12, unless a PIC is incapacitated or an operator has established another means of reporting accidents or incidents, in which case an operator shall initiate the report;

1.6.3 The aircraft was registered to the new owner on 16 March 2021. At the time of the fatal accident, it had accrued a total of approximately 2 797.3 airframe hours. The last annual inspection on the microlight was certified on 2 December 2020 at 2 664 Hobbs hours. The most recent maintenance conducted was a 25-hour oil change inspection which was completed on 7 March 2021 at 2773.7 airframe hours. There were no pre-existing defects with the airframe or engine noted during the investigation that could have affected normal operation.

1.6.4 The aircraft was issued an Authority to Fly (ATF) certificate on 6 January 2021 with an expiry date of 31 January 2022. The microlight flew a further 23.6 hours since the 25-hour oil change.

Engine:

Manufacturer/Model	Bombardier Rotax 582
Serial Number	5437745
Part Number	3487
Hours Since New	590.6
Hours Since Overhaul	Not reached

Propeller:

Manufacturer/Model	Warp Drive Propellers
Serial Number	C18165
Part Number	13919
Hours Since New	1725.4
Hours Since Overhaul	Not reached

1.6.5 According to the airframe logbook, the engine was removed from the aircraft and was subjected to an overhaul on 7 August 2020. The engine was refitted to the airframe on 20 November 2020 and the engine runs were carried out without any issues.

1.6.6 According to the ATO representative, the aircraft was refuelled to capacity (50 litres) on 14 March 2021. No fuel uplift was recorded on the flight folio, however, fuel that was siphoned from the tank was approximately 35 litres.

1.6.7 The Mass and Balance Report (CA43-17) was approved by the Regulator (SACAA) on 19 November 2019 with an expiry date of 19 November 2024. The calculated total take-off weight of the microlight on the day of the accident was approximately 417kg. The maximum certificated take-off weight was 450kg.

Empty Weight	177 kg (390 lbs)
Pilot	95 kg (209 lbs)
Passenger	120 kg (265 lbs)
Fuel	25 kg (55 lbs)
Total	417 kg (919 lbs)
MTOW	450 kg (992 lbs)

Note: The estimated minimum weights of the deceased outlined above were taken from the legal post-mortem report.

1.7. Meteorological Information

The weather report was obtained from the South African Weather Service (SAWS) for the day and time of the accident. The information provided by SAWS in the table below was taken from the Meteorological Aerodrome Report (METAR) recorded at King Shaka International

Airport (FALE) on 17 March 2021 at 0600Z, which is located 12 nautical miles (nm) south-west of Ballito Airfield.

Wind Direction	100°	Wind Speed	04kts	Visibility	9999m
Temperature	22°C	Cloud Cover	Few	Cloud Base	3 800ft
Dew Point	20°C	QNH	1013hPa		

1.8. Aids to Navigation

1.8.1. The aircraft was equipped with standard navigational equipment as approved by the Regulator (SACAA). There were no records indicating that the navigation system was unserviceable prior to the accident flight.

1.9. Communication

1.9.1. The aircraft was equipped with standard communication system as approved by the Regulator. There were no recorded defects with the communication system prior to the accident flight.

1.10. Aerodrome Information

1.10.1 The accident took place approximately 624m north-east of Ballito Airfield, and about12nm from FALE.

Aerodrome Location	Ballito, KwaZulu-Natal Province	
Aerodrome Status	Unregistered	
Aerodrome GPS coordinates	29˚29’20.0” South 031˚10’45.0” East	
Aerodrome Elevation	200 feet	
Runway Headings	08/26	18/36
Dimensions of Runway Used	500x40m	250x40m
Heading of Runway Used	08	
Surface of Runway Used	Grass	
Approach Facilities	None	
Radio Frequency	124.2MHz	

1.11. Flight Recorders

1.11.1. The aircraft was not equipped with a flight data recorder (FDR) or a cockpit voice recorder (CVR), nor was it required by regulation to be fitted to the aircraft type.

1.12. Wreckage and Impact Information

1.12.1 The microlight struck the ground in a steep nose-down attitude approximately 624m north-east of the extended centreline of Runway 08. The wing separated from the structure/mainframe and was found next to the mainframe. The wing's leading edge was intact and the cables that attach and keep the wing structure together were not frayed or broken. The trapeze down tubes, corner fittings, attachment points, bracket bolts and nuts were in place. The fixed washout tubes on the wing tips were still intact. The general condition of the main support tube was good; however, a shear lip fracture was visible where it attaches to the mainframe, indicative of instantaneous failure due to impact sequence. The wing fabric was not torn. The cable that prevents wing separation from the main support tube appeared to have a cut which is consistence with the shear lip fracture of the main support tube. The hang point assembly was still intact, and it was configured with training bars to facilitate operation from the tandem seat. The pylon pivot point was still intact and no sign of damage was visible. The flying cables were also still intact.

Figure 4: Wing section and hand glide fitted with training bars extend tubes.
The inset shows extended training bars.

Figure 5: The boom that fractured and separated from the nose gear.

1.12.2 The shock aerofoil on the left-side was damaged, whilst the right-side was still attached. The main wheel was still attached to its respective axle. The nosewheel had separated from the tube, which seemed to have been from the impact fracture. The hub was fractured in different places with smaller pieces found in the vicinity of the tyre assembly; the tyre came off of the hub. The foot throttle and brake assembly cables and linkages were still in place, the cables were not frayed or broken. Continuity was verified and found to be satisfactory. Both seats appeared to have been heavily disturbed. The fuel tank, which is housed underneath the seat, was not ruptured and had approximately 35 litres of fuel.

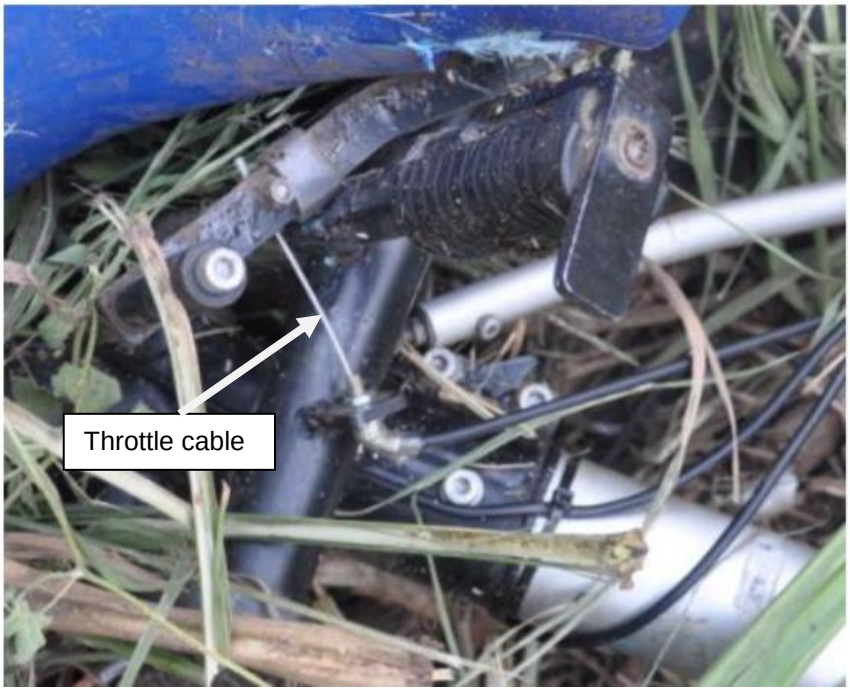


Figure 6: The arrow points to throttle cable with linkages still attached.

1.12.3 The instrument panel detached when the nosewheel separated from the tube. The instruments were severely damaged as a result of impact forces, and had separated from the instrument panel. The airspeed indicator glass was shattered as a result of impact, and the needle pointed at 78 miles per hour (mph). The vertical speed indicator glass had also broken, and the needle pointed at 300 feet per minute (fpm). The impact force damage to the microlight was such that the nose section of the microlight was significantly disrupted, indicative of a nose-down attitude at impact.

Figure 7: The damaged nose section. The left inset image shows airspeed indicator and the right inset image shows vertical speed indicator of the instrument panel.

1.12.4 All three propeller blades sustained damage during the impact sequence, indicating that the engine was producing maximum power at the time of the accident. Pieces of the composite blades were found in the vicinity of the accident site. The engine radiator was properly attached to its mountings and the cap was missing, although the coolant inside the radiator was still showing enough quantity. All associated hardware (fuel pipes, electrical wires and exhaust system) of the engine were intact. The propeller flange was rotated by hand, and it rotated freely, indicating free internal components movement. The carburettor float bowls were removed and fuel samples were taken. The fuel sample indicated positive fuel flow before impact. The fuel filter was checked and there was fuel inside; no sediment or contamination was present.

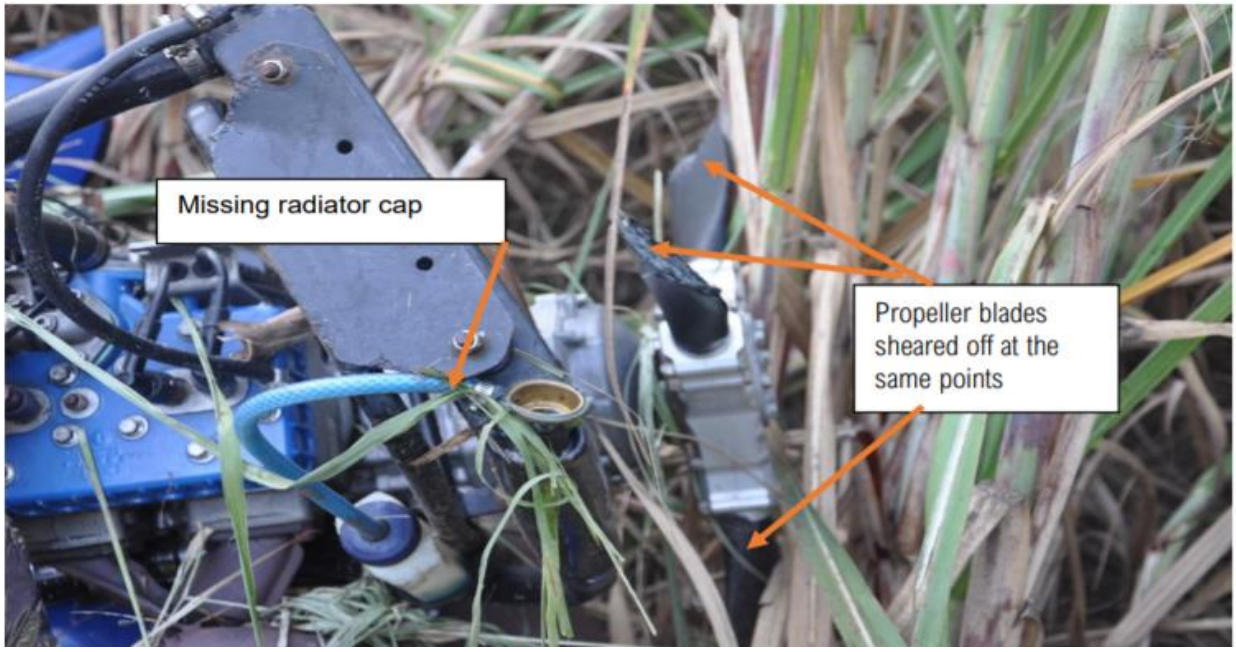


Figure 8: Damaged propeller blades and radiator with a missing cap.

1.12.5 The microlight fuel tank was found intact. It contained approximately 35 litres of fuel.

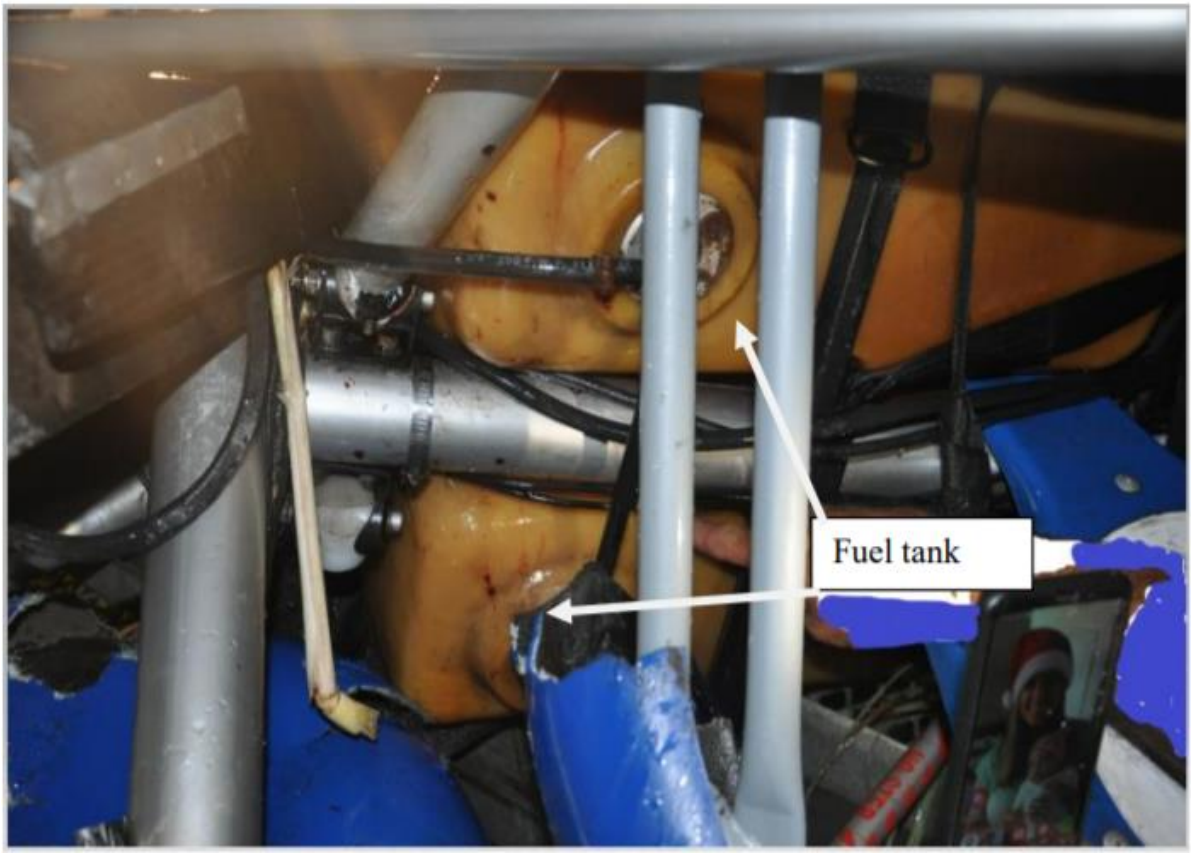


Figure 9: The fuel tank which was found intact.

1.12.6 On-site inspection of the airframe, engine and propeller indicated that there were no pre-impact failures, and all damage was attributed to impact forces.

1.12.7 There was fuel contained in the filter, fuel lines and carburettor. The fuel was free from contaminants, and the fuel lines were still intact.

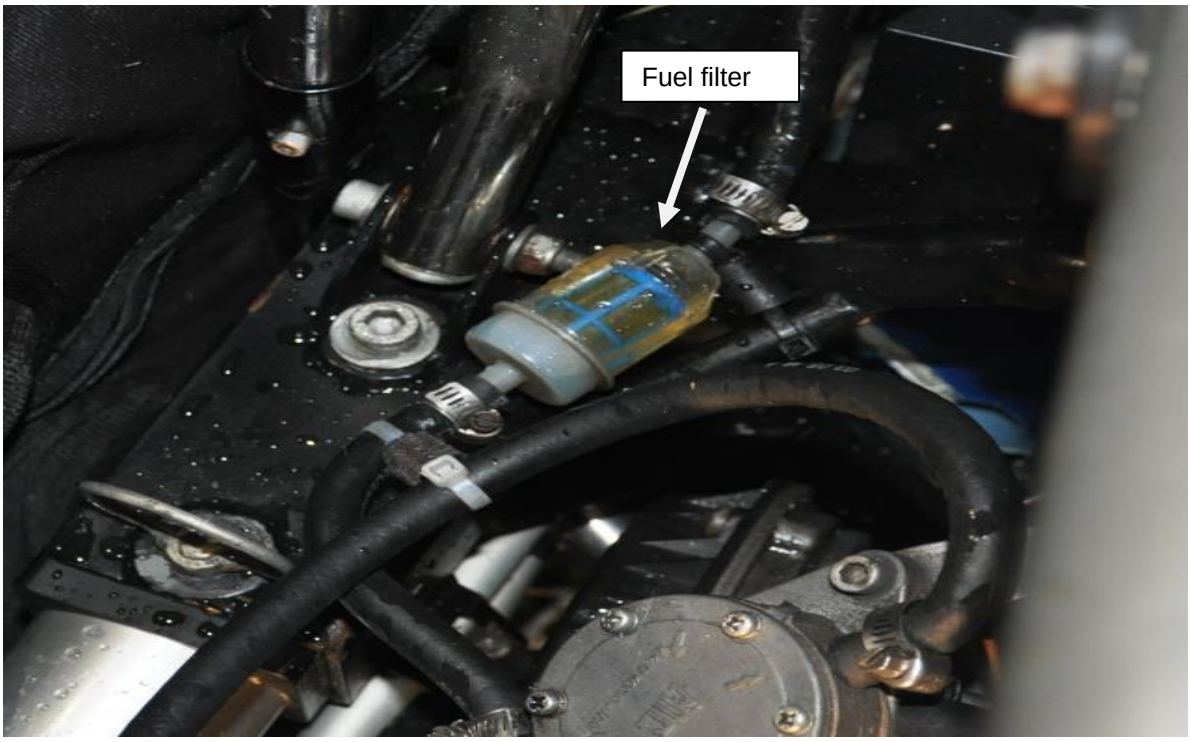


Figure 10: Fuel in the filter.

1.13. Medical and Pathological Information

1.13.1 Post-mortem examination found that the pilot had suffered multiple blunt force injuries during the accident.

1.13.2 Post-mortem examination showed that the passenger had suffered multiple blunt force injuries as well as cardiovascular disease during the accident.

1.13.3 At the time of finalising this investigation, the toxicology report was not available. Should any of the results have a bearing on the circumstances leading to the accident, they will be treated as new evidence and that will necessitate the reopening of the investigation.

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 not survivable as the open cockpit structure was destroyed on impact. Both occupants had made use of the aircraft's safety harnesses, however, the injuries sustained were not survivable due to the nature of impact.

1.16. Tests and Research

1.16.1 Engine rotation and fuel continuity

The propeller flange was rotated by hand to simulate free engine rotation, and the engine rotated freely, indicating free movement of the internal components. The carburettor bowls were removed from the engine, they were full and this indicated positive fuel flow before impact. The fuel samples were taken, and the fuel used was 95 Octane Unleaded. The fuel filter was also checked and there was fuel inside, and no sediment or contamination was found.

1.17. Organisational and Management Information

1.17.1 The flight was conducted in accordance with the provisions of Part 141 of the CAR 2011 as amended.

1.17.2 The ATO had an approved ATO operation certificate issued on 10 February 2020 with an expiry date of 28 February 2022. The ATO certificate was issued in terms of Part 141 of the South African CAR 2011 as amended. The ATO was also in possession of an approved operations manual. The last SACAA physical audit was conducted on 7 February 2019 and the ATO operation certificate was renewed for two (2) years ending February 2022. There were no findings from the Regulator's report. The last audit at the ATO was conducted by the SACAA on 19 December 2021, and no findings were recorded.

1.17.3 According to the ATO certificate, the ATO had four microlights and was approved to conduct training on Light Sport Aircraft, Weight Shift Microlight and Conventional Microlight for National Pilot Licence under Part 62.

1.17.4 The aircraft was maintained by a qualified Approved Person (AP). The AP's licence/certificate number was issued on 12 January 2021 with an expiry date of 13 January 2023, and the microlight was endorsed on his licence.

1.18. Additional Information

1.18.1 The Introductory Flight Procedure: (Source: Operations ATO)

The potential student signs an indemnity and understands that this is an initial flight which is focused on-air experience. They are made aware that this flight is accredited towards gaining a full microlight pilot's licence if training is continued (this is highlighted on the indemnity form as well).

A safety briefing is given with regards to loose items coming adrift and potentially hitting the propeller (Safety notice on hangar also highlights potential dangers). The open cockpit

concept is explained with regards to differences between open and closed cockpit flying, highlighting wind factors, and the rocking motion due to the pivoting factors involved in weight shift controlled micro lighting.

The critical controls are explained to the student and advised on what controls to stay clear of (i.e., Rear throttle under the right foot, and the rear training control bars). It is explained to the student that outside of critical phases of flight, the instructor will allow them to manipulate the controls and get a feel of the aircraft. They are assisted into the aircraft, ensuring that they are safely strapped in with the seatbelt, and are given the headset and goggles for wind. Any questions that the potential student has been answered and explained.

1.18.2 Carburettor Icing

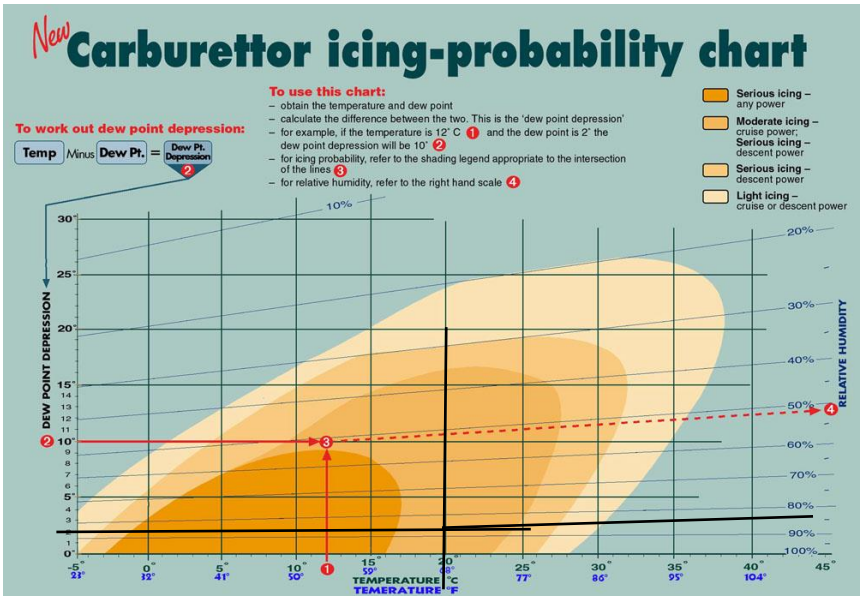


Chart 1: Carburettor icing chart

According to the weather report at FALE, the temperature was 22°C, the dew point was 20°C and the dew point depression was 2°C. When plotted on the carburettor icing chart, it places the marker on moderate icing on cruise power and serious icing on descent power with relative humidity at 85%.

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. This shall not be read as apportioning blame or liability to any organisation or individual.

2.2. Analysis

2.2.1 Man

The pilot was initially issued a Commercial Pilot Licence (CPL) on 2 December 1994. His last licence revalidation was on 27 January 2021 with an expiry date of 26 January 2023. The pilot was also initially issued a National Pilot Licence on 26 June 2020 with an expiry date of 25 June 2021. The pilot had a valid aviation Class 4 medical certificate with no medical waivers, issued on 26 June 2020 with an expiry date of 31 October 2022. The pilot only flew 9.7 hours. Based on the hours flown by the pilot, fatigue was not a factor.

The pilot had a total of 21 826 flying hours of which 109 were on microlight. Therefore, the pilot had adequate experience. The investigation could not find any reason that the experience of the pilot played a role in this accident based on the fact that he flew different types of microlight and he had more experience in commercial flying using large aircraft than on small aircraft.

The microlight was maintained by a qualified AP. The AP's licence/certificate number was issued on 12 January 2021 with an expiry date of 13 January 2023.

2.2.2 Machine

The microlight was maintained by an AP. The last annual/mandatory periodic inspection (MPI) was carried out on 2 December 2020 at 2 664.0 airframe hours. The microlight was issued a Certificate of Release to Service (CRS) on 2 December 2020 with an expiry date of 1 December 2021 or at 2 764 airframe hours, whichever occurs first. The microlight was issued an Authority to Fly (ATF) certificate on 31 January 2021 with an expiry date of 31 January 2022. The most recent maintenance of the airframe and engine was a 25-hour check completed on 7 March 2021 at 2773.7 flying hours.

The microlight was registered to the new owner on 16 March 2021. At the time of the accident, the microlight had accrued an approximate of a total of 2 797.3 hours. There were no pre-existing defects with the airframe or engine that were noted during the investigation that could have affected normal flight. From the evidence found at the crash site and during further inspection of the airframe and the engine, it was concluded that the airframe did not have any pre-impact damage that would have adversely influenced its controllability. The wreckage site was contained in one area, thus, ruling out an in-flight breakup. There were no pre-existing malfunction, and all damage sustained was attributed to impact.

The calculated weight of the microlight was approximately 417kg at the time of the accident, which was well within the limit (MTOW is 450kg). The weight and balance were not considered a factor in this accident.

2.2.3 Medium (Weather Conditions)

The reported weather condition at the time of the accident was considered to have no bearing to this accident. The probability of carburettor icing was considered during the investigation due to the reported weather and was calculated based on the dew point depression formula by taking into consideration the temperature and dew point, which added to 85% relative humidity. The chart also depicted serious icing during descent and moderate icing during cruise. However, it is not known at which phase of flight did the accident occur. The carburettor icing was ruled out as stated above. The damage sustained by the propeller blades indicated that the engine was turning at full power during impact.

2.2.4 Mission

This was a training flight that was conducted under the provisions of CAR 2011 Part 141.

2.2.5 Management

The ATO had an approved ATO certificate that was issued on 10 February 2020 with an expiry date of 28 February 2022. The operator also had an approved operations manual. The ATO certificate was issued in terms of the CAR 2011 Part 141. The last audit was conducted on 19 December 2021 by the Regulator and there were no findings recorded. The ATO conducts introductory flights to potential customers who want to undertake pilot training. The ATO had an indemnity form in place that was duly signed by the passenger before the flight. A review of the passenger's financial statement indicated that there was a payment made for the flight, however, the passenger was not issued a ticket.

2.2.6 Investigation

It is likely that the pilot lost control of the microlight during the flight, which resulted in the microlight striking the ground in a steep nose-down attitude approximately 624m north-east of the extended centreline of Runway 08. Although, the microlight was serviceable in terms of the approved maintenance schedule, the cause of the accident could not be determined with certainty. According to the introductory flight leaflet, the critical controls are explained to the students, and the students are advised on what controls to stay clear of (that is rear throttle under the right foot, and the rear training control bars). Also, it is explained to the students that when the microlight is outside of critical phases of flight, the instructor will allow them (students) to manipulate the controls and get a feel of the aircraft. The investigators focused on a series of elimination of hypotheses that were formulated during the investigation to determine the likelihood of the probable causes, which were the carburettor icing, fatigue,

loss of control, lack of experience, person behind the controls and medical conditions of the passenger. All the hypotheses were ruled out except for the loss of control. However, the cause of the loss of control could not be determined.

3. CONCLUSION

3.1. General

From the available evidence, 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 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 occurring, or would have mitigated the severity of the consequences of the accident. 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 was initially issued a Commercial Pilot Licence (CPL) on 2 December 1994. His last licence revalidation was on 27 January 2021 with an expiry date of 26 January 2023. He was initially issued a National Pilot Licence on 26 June 2020 with an expiry date of 25 June 2021. The pilot was also issued a Class 4 aviation medical certificate on 26 June 2020 with an expiry date of 31 October 2022.

3.2.2 The pilot only flew 9.7 hours.

3.2.3 The passenger was not in possession of an aviation medical certificate and/or student pilot licence. However, this was not a requirement according to the regulation. The passenger had a heart pacer on the left arm. The passenger's post-mortem results indicated that the cardiovascular disease contributed to the fatality.

3.2.4 The microlight was maintained by a qualified AP. The AP's licence was issued on 12 January 2021 with an expiry date of 13 January 2023.

3.2.5 The flight was conducted under visual flight rules (VFR) by day and under the provisions of Part 141 of the CAR 2011 at the time of the accident.

3.2.6 The microlight was issued an Authority to Fly (ATF) certificate on 31 January 2021 with an expiry date of 31 January 2022.

3.2.7 The microlight owner was issued a Certificate of Registration (C of R) on 16 March 2021.

3.2.8 The microlight was involved in a forced landing accident on 18 December 2015 at Salt Rock beach in the North Coast in KwaDukuza, KwaZulu-Natal. This accident was neither reported to the AIID nor the SACAA. This was in contravention of the CAR 2011 Part 91.02.3 (subpart 4g).

3.2.9 The last annual inspection that was carried out on the microlight prior to the accident flight was on 2 December 2020 at 2 664 Hobbs hours. The microlight was issued a Certificate of Release to Service (CRS) on 2 December 2020 with an expiry date of 1 December 2021 or at 2 764 airframe hours, whichever occurs first. The microlight accrued 133.3 hours since the last annual inspection. The most recent maintenance of the airframe and engine was a 25-hour check which was completed on 7 March 2021 at 2 776.9 hours.

3.2.10 The operator was issued an Approved Training Organisation (ATO) certificate on 10 February 2020 with an expiry date of 28 February 2022.

3.2.11 The probability of carburettor icing was considered during the investigation due to the reported weather conditions, and was calculated based on dew point depression formula by considering temperature and dew point, which gave a score of 85% relative humidity. The chart also depicted serious icing descent and moderate icing during cruise. The weather at the time of the flight was not a factor.

3.2.12 There were no mechanical defects with the microlight prior to impact, all damage sustained was a result of the accident. Approximately 35 litres of fuel was in the tank at the time of impact. The damage on the propeller blades indicated that there was sufficient engine power at impact. Also, the evidence of positive fuel feed collected inside the carburettor bowls and the fuel filter assembly confirmed the same.

3.2.13 The microlight was fitted with training bars; it is not known who was at the controls at the time of the accident.

3.2.14 The pilot lost control during the flight, which resulted in the microlight striking the ground in a steep nose-down attitude approximately 624m north-east of the extended centreline of Runway 08. The cause of loss of control could not be determined.

3.3. Probable Cause/s

3.3.1 It is likely that the pilot lost control of the microlight during the flight, which resulted in the microlight striking the ground in a steep nose-down attitude approximately 624m north-east of the extended centreline of Runway 08. The cause of the loss of control could not be determined.

3.4. Contributory Factor/s

3.4.1 None.

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.

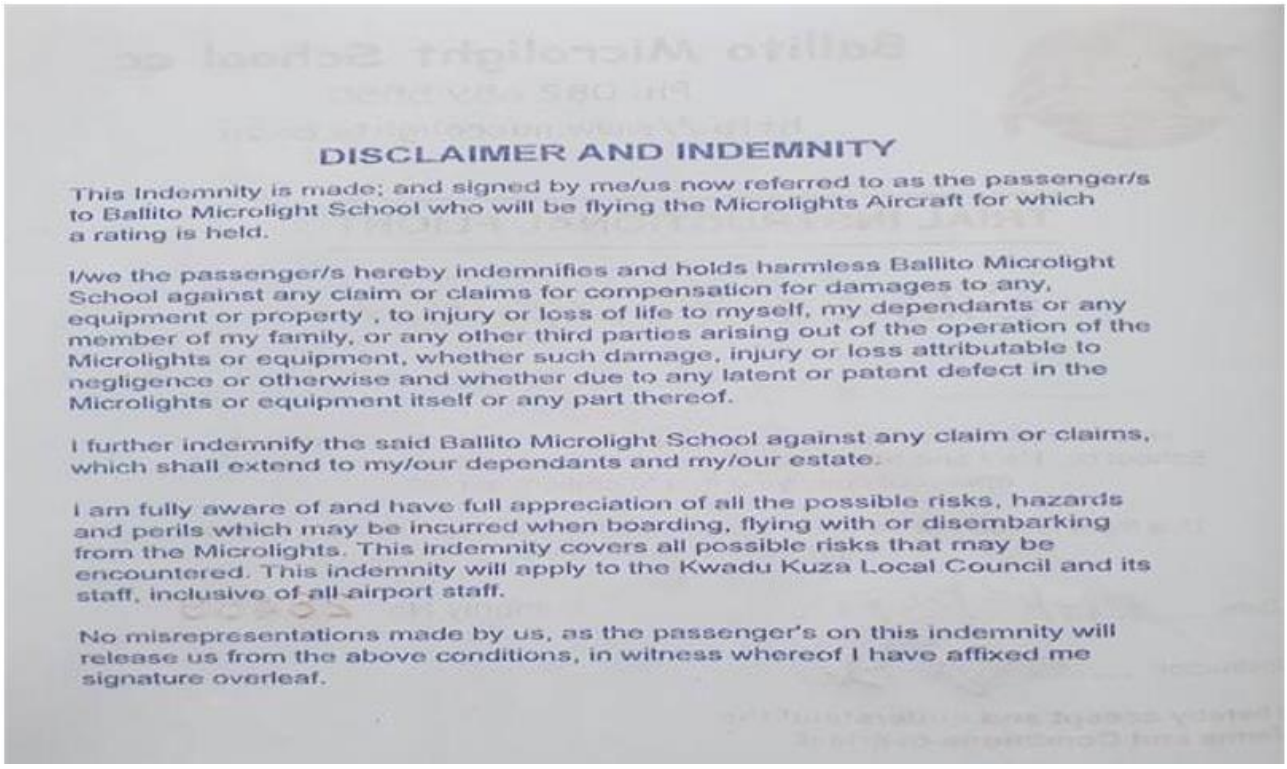
5. APPENDICES

5.1. Annexure A (Indemnity form)

This report is issued by:

Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa

Annexure A



DISCLAIMER AND INDEMNITY

This Indemnity is made; and signed by me/us now referred to as the passenger/s to Ballito Microlight School who will be flying the Microlights Aircraft for which a rating is held.

I/we the passenger/s hereby indemnifies and holds harmless Ballito Microlight School against any claim or claims for compensation for damages to any, equipment or property , to injury or loss of life to myself, my dependants or any member of my family, or any other third parties arising out of the operation of the Microlights or equipment, whether such damage, injury or loss attributable to negligence or otherwise and whether due to any latent or patent defect in the Microlights or equipment itself or any part thereof.

I further indemnify the said Ballito Microlight School against any claim or claims, which shall extend to my/our dependants and my/our estate.

I am fully aware of and have full appreciation of all the possible risks, hazards and perils which may be incurred when boarding, flying with or disembarking from the Microlights. This indemnity covers all possible risks that may be encountered. This indemnity will apply to the Kwadu Kuza Local Council and its staff, inclusive of all airport staff.

No misrepresentations made by us, as the passenger's on this indemnity will release us from the above conditions, in witness whereof I have affixed me signature overleaf.