SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Section/division **Accident and Incident Investigations Division** Form Number: CA 12-57

LIMITED ACCIDENT INVESTIGATION REPORT

Reference Number	CA18/2/3/10024						
Classification	Accident	**Date**	25 July 2021	**Time**	1245Z		
Type of Operation	Operation of Non-type Certified Aircraft (Part 94)						
Location							
Place of Departure	Fochville Aerodrome, Gauteng Province	Place of Intended Landing	Wingfield Private Airstrip, Gauteng Province				
Place of Accident	Wingfield Private Airstrip, Loch Vaal, Gauteng Province						
GPS Co-ordinates	Latitude	S 29º 22' 29.5"	Longitude	E 031º 19' 07.3"	Elevation	4744ft	
Aircraft Information							
Registration	ZU-FCP						
Model/Make	Quad City Challenger II						
Damage to Aircraft	Destroyed	Total Aircraft Hours	451 hours				
Pilot-in-command							
Licence Valid	No	Gender	Male	Age	45		
Licence Type	Not licensed						
Total Hours on Type	Unknown	Total Flying Hours	Unknown				
People On-board	1 + 1	Injuries	2	Fatalities	0	Other (on ground)	0

What Happened

On Sunday, 25 July 2021, a pilot and a passenger (the pilot's wife) on-board a Quad City Challenger II aircraft with registration ZU-FCP took off on a private flight from Fochville Aerodrome, Gauteng province, with the intention to land at Wingfield Private Airstrip, Gauteng province. The aircraft was operated under Visual Flight Rules (VFR) by day and in clear weather conditions. During final approach at Wingfield Private Airstrip, the aircraft collided with powerlines located directly above a palisade fence (at Wingfield Private Airstrip) and crashed near the threshold of Runway (RWY) 28, about 40 metres from the palisade fence.

An eyewitness who was standing approximately 500 metres (m) from the threshold of RWY 28 stated that he heard the aircraft flying towards the airstrip from the east; and later heard the engine sound decreasing, an indication that the pilot was reducing power in preparation to land. The aircraft approached the airstrip for landing straight-in on final leg. With the aircraft now visible, the eyewitness recorded the aircraft's final approach and landing as he was fascinated with aircraft in general. In the footage, which was captured about 500m from the threshold of RWY 28, the aircraft is seen colliding with powerlines, bringing the aircraft to a stop and causing it to pitch down before crashing in a left wing-low and nose-down attitude.

The aircraft was destroyed, and both occupants sustained serious injuries during the accident sequence. The pilot was airlifted to a nearby hospital and the passenger was transported to the same hospital (as the pilot) by road.

Figure 1: Broken electric pole and damaged palisade fence caused by the collision of the aircraft with the powerlines. (Source: Airstrip owner)

Figure 2: The aircraft post-accident.

According to the pilot's wife (passenger), they departed Fochville Aerodrome for Wingfield Airstrip with plans to have a picnic. She stated that the pilot had flown to Wingfield Airstrip a while ago with a friend. She recorded their trip using a cellular phone while en route to Wingfield.

From the audio in the footage taken behind the pilot in the tandem two-seat aircraft, the engine seems to be producing adequate power and sounds normal; thereafter, the engine is heard running at a lower speed when the pilot reduces speed for landing just before the aircraft collides with the powerlines. The footage also shows the transparent Perspex side panels and windscreen, indicating that the aircraft approached the runway facing the sun. The sun's glare on the Perspex possibly made it difficult for the pilot to see the powerlines in the approach path.

According to the pilot's friend who had flown with him to Wingfield Airstrip previously, there used to be tall trees parallel to the airstrip's perimeter fence that pilots used as a reference to avoid colliding with the powerlines which extend beyond the height of the perimeter fence of the airstrip.

What was found:

According to the owner of the Wingfield Airstrip, the airstrip is not open to public for picnics; also, landing at the airstrip is at the risk of the pilot. The airstrip is not registered and is private property, therefore, the pilot would have been advised that picnics were prohibited at the airstrip if he had enquired prior to the flight. According to the airstrip's policy, pilots without a valid pilot licence are prohibited from using the airstrip.

The following were noted during the on-site investigation of the aircraft wreckage:

- The engine was turned by hand, and it turned freely without obstruction.
- The aircraft had approximately 5 gallons of fuel in the 10-gallon fuel tank.
- The aircraft's hydraulic system was still intact and a quarter (¼) of hydraulic fluid was found in the system.
- All flight control surfaces were found still attached to the aircraft.
- All damage observed was attributed to impact forces because of collision with powerlines and hard landing of the aircraft during the accident sequence (see Figure 1).

Post-accident on-site investigation confirmed that the aircraft collided with the electric powerlines before it crashed near the threshold of RWY 28. The wreckage damage observed indicated that the aircraft's belly was scrapped by the powerlines, and the left and right landing gears got entangled with the powerlines, which was exhibited by the wire striation marks. The aircraft impacted the ground hard and was destroyed by impact forces; as a result, both occupants on-board were seriously injured.

Clear weather conditions with light wind prevailed at the time leading to the accident; the weather conditions did not contribute to the accident.

In the video footage taken by the passenger, a powerline wooden pole is located to the right of the aircraft's path. The powerline wooden poles are 12 metres (m) high and are placed 30m apart along the road. There are two powerline wooden poles in the airstrip's yard, the other one (powerline wooden pole) would have been to the immediate left of the aircraft's path.

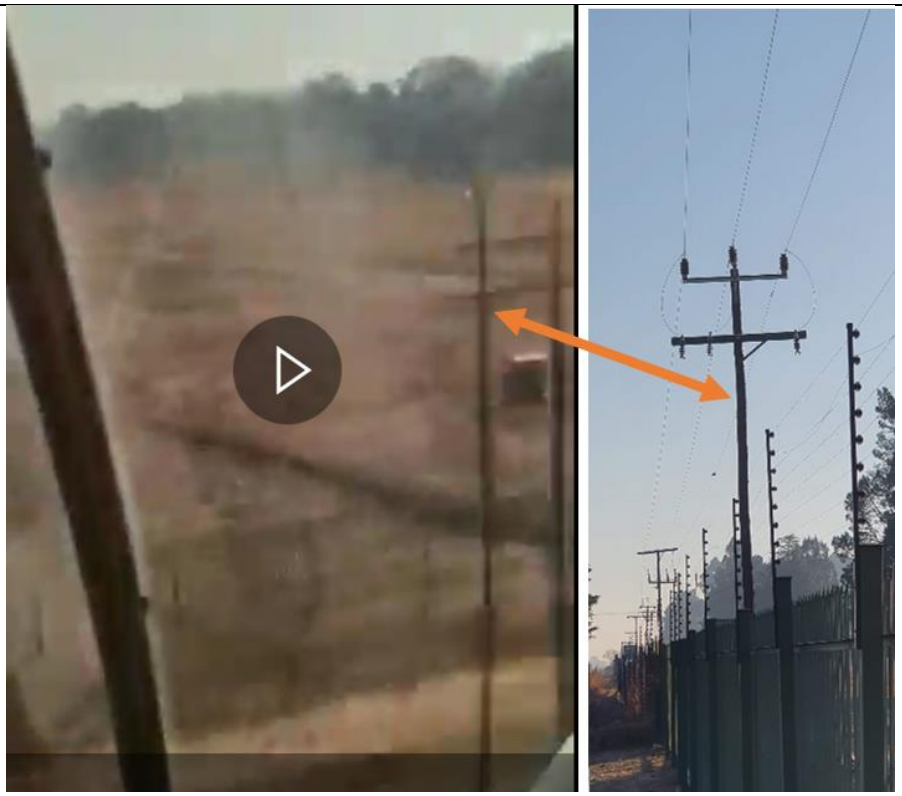

Figure 3: Left: Powerline supporting pole as seen from the video taken on-board the aircraft (Source: Pilot's friend). **Right:** Image of powerlines supporting poles taken on the ground.

According to the *ATSB's Wire-Strike Accidents Analysis of 2006*, Powerline hazards can be described as follows:

- *These systems are particularly hazardous to pilots, as both the wire and the supporting poles may be difficult to distinguish from the background environment. Furthermore, these wires are often found across the approach path to an airstrip.*
- *There are several factors associated with powerlines, such as the number of wires, the height of the wires, and the direction of the wire run, can determine whether a pilot sees a wire. Other factors restricting visibility include the position of the sun, changing light conditions, background camouflage, the obscuring effects of terrain, and poor weather. A more obvious factor is a dirty windscreen.*
- *By identifying at least two poles, a pilot may be able to gauge the path of the wire. Although poles provide pilots with one of the most reliable indicators of the presence of wires, the poles themselves are not always easy to see. Wooden poles can be easily camouflaged by the landscape or hidden by foliage and trees. Poles are typically used by pilots to alert them to the presence of a wire run,*

According to the *ATSB's Wire-Strike Accidents Analysis of 2006, Situational Awareness is one of the best risk mitigation strategies to preventing wire strike*:

- *Strategies used to establish and maintain adequate situational awareness include reading the physical structure indicators (i.e., orientation of insulators, presence of bucked arms and sighting two or more poles), self-discipline, pre-flight briefing, pre-flight reconnaissance and observation, memory and awareness, appropriate flying techniques, maintenance of a good visual scan and consideration of weather factors.*

There were no documents found in the wreckage and, according to the South African Civil Aviation Authority (SACAA) records, there was no record of the pilot's licence nor were there any records of a valid Authority to Fly (ATF) for the aircraft. According to Subpart 94.01.2 of the Civil Aviation Regulations (CAR) of 2011:

Authority to fly
94.01.2 (1) No person shall operate a non-type certificated aircraft unless—

- *(b) the aircraft is in an airworthy condition; and*
- *(c) the PIC is the holder of a valid pilot license with the appropriate rating for the category and type of non-type certificated aircraft.*

Probable cause:
Collision with powerlines during landing due to the pilot's lack of situational awareness as he did not look out for powerline poles. This was exacerbated by poor visual scan of the area due to the sun's glare on the Perspex windscreen.

Contributing factors:
Operation of the aircraft by an unlicensed and unrated person.

Safety Action/s

The owner of Wingfield Private Airstrip indicated that an order was placed for overhead wire marker spheres through ESKOM months before the accident took place, however, there has been a delay in the delivery of the spheres.

Safety Message and/or Safety Recommendation/s

1. The pilot who operated the aircraft was in contravention of subpart 94.01.2 (1)(b) and (c) as the pilot was unlicensed and unrated on the aircraft type. Furthermore, according to SACAA records, the aircraft was not issued a valid Authority to Fly (ATF). It is, thus, recommended that the Director of Civil Aviation (DCA) through relevant divisions, engage the industry on the importance of being licensed, and that pilots refrain from operating aircraft without proper documentations as required by regulations.

2. It is also recommended that the general aviation division in collaboration with aircraft registry division, conduct safety awareness and oversight for aircraft owners to inform them on the importance of having current ATF certificates and licences.

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 to apportion blame or liability****.*

About this Report

Decisions regarding whether to investigate, and the scope of an investigation are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, no investigation has been conducted, and the Accident and Incident Investigations Division (AIID) has relied on the information submitted by the affected person/s and organisation/s to compile this brief report. The report has been compiled using information supplied in the initial notification, as well as follow-up information to bring awareness of potential safety issues to the

industry in respect of this occurrence, as well as possible safety action/s that the industry might want to consider in preventing a recurrence of a similar accident.

This report provides an opportunity to share safety message/s in the absence of an investigation.

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.

Disclaimer

This report is issued by:

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