

**MINISTRY OF COMMUNICATIONS AND TRANSPORT  
ACCIDENT INVESTIGATION BRANCH**

**CIVIL AIRCRAFT ACCIDENT NO. CAV/ACC/19/96**

**REPORT ON THE ACCIDENT TO CESSNA F406  
AIRCRAFT REGISTRATION 5H-TZC WHICH OCCURRED ON 15 SEPTEMBER,  
1996 AT ZIWANDU (MBUYUNI) AIRSTRIP,  
SELOUS GAME RESERVE, TANZANIA  
(07 41 16S 038 08 13E)**

**TANZANIA ACCIDENT INVESTIGATION BRANCH**

**AIRCRAFT ACCIDENT REPORT NO. CAV/ACC/19/96**

**Aircraft type:** : Cessna F406 Caravan II

**Nationality:** : Tanzania

**Registration:** : 5H-TZC

**Place of accident:** : Ziwandu (Mbuyuni ) airstrip, Selous  
Game Reserve, Tanzania  
(07 41 16S 038 08 13E)

**Date and Time:** : 15 September, 1966 at 1055 hours

**Registered owner:** : Tanzanian Air Services  
P.O. Box 364 DAR ES SALAAM

**Operator:** : Tanzanian Air Services (see above)

**Crew:** : 1 - Uninjured

**Passengers:** : 13 - Uninjured

## SYNOPSIS

On 15th September, 1996 at 105 hours 5H-TZC took off from Dar es Salaam International Airport for a charter flight to Ziwandu airstrip. It was carrying 14 persons including one pilot. The pilot said that the flight to Ziwandu was normal. On reaching Ziwandu he observed that the runway was clear but took the precaution of circling twice overhead the runway in order to scare away animals in the neighbouring bushes. At 1053 hours the pilot initiated a touchdown on runway 18. During the landing roll and when he was about halfway down the runway he saw three impalas running across the runway from right to left. He managed to avoid the first two but collided with the last one.

The aircraft was successfully stopped on the runway and all the 14 occupants disembarked uninjured. The aircraft sustained damage to the right engine and propeller.

In conclusion, the report establishes that the aircraft collided with an impala during the landing roll. It was, however, not possible to establish whether there was more information leading to the causes of the accident due the operator's action of tampering with the wreckage prior to the arrival of inspectors at the accident site.

## 1. FACTUAL INFORMATION

### 1.1 History of the flight

On 15th September, 1996 at 1020 hours a 14 seater twin engined Cessna F406 Caravan II with registration marks 5H-TZC took off from Dar es Salaam International Airport for a charter flight to Ziwandu. It was carrying one pilot and 13 passengers. The flight to Ziwandu was uneventful. When 5H-TZC reached the airstrip the runway was clear. The pilot, however, took the precaution of circling twice overhead the airport in order to scare away the animals which may have been hiding in the surrounding bushes. He subsequently made a touchdown on runway 18.

The pilot said that the touchdown and the initial ground roll were normal. When the aircraft was about halfway down the 1100 - metre runway he saw three impalas running across the runway from right to left. He managed to avoid two of them but the right propeller hit and killed the last one. The aircraft was successfully stopped on the runway and all the occupants disembarked uninjured. The aircraft was substantially damaged.

### 1.2 Injuries to persons

	Crew	Passengers	Others
Fatal	-	-	-
Serious	-	-	-
None	1	13	N/A

### 1.3 Damage to aircraft

The aircraft sustained substantial damage to the right propeller and the right engine.

### 1.4 Other damages

Nil

### 1.5 Personnel Information

The pilot, Captain Francis Hubertus Johannes Driessen was born at Wynamdsrade, Holland on 18 May 1954. He held a Commercial Pilot's Licence No. HP 468 granted on 7.12.95 on the strength of his Kenya CPL No. YK - 2239 - CL issued 19.1.90. He

also held a Radio Telephony Operator's licence No. H762 which was kept in line with his CPL.

By the time of the accident his CPL was valid till 7 November 1996.

He had the following ratings to his licence:

**Group I**

Cessna 206,210,310,401,402,406

Beach Baron 55

At the last renewal he claimed at total experience of 5,543.8 hours broken down as follows:

	Day	Night
Pilot in command (P1)	5,400.55	115.25
Co-pilot (P2)	28	

**1.6 Aircraft Information**

The aircraft, a Cessna F406 Caravan II Serial No. F406-0028 powered by two Pratt & Whitney PT6A-112 engines was manufactured by the Cessna Aircraft Company at Wichita Kansas U.S.A in 1988. It was first registered in Tanzania on 28 August 1992 in the name of Tanzanian Air Services, P.O. Box 364 Dar es Salaam. A certificate of registration No. 332 was issued.

The aircraft was issued with a certificate of airworthiness No. 286 on 11 December 1992 to expire 12 months later. It had since been kept current through periodic renewals. By the time of the accident, the Certificate of Airworthiness was valid till 10 December 1996.

**1.7 Meteorological information**

It was a bright sunny day with temperature estimated at 28 degrees centigrade. The weather was not a factor in this accident.

**1.8 Aids to navigation**

Not applicable.

**1.9 Communications**

Not applicable.

**1.10 Aerodrome information**

Ziwandu airstrip, elevation 100 feet has a single runway 18/36. The surface is fairly hard soil. The length of the runway is 1100 metres and the width varies at different points along the entire length of the runway. There are bushes and trees scattered just

beyond the edges of the runway. These become comfortable shelters for wild animals. Some animals cannot be seen easily when they are hiding in these bushes.

There is a wind sock which is located below the level of the adjacent trees. The airstrip is appropriately of the Tanzania Wildlife.

**1.11 Flight records**

Not required by regulations. None fitted.

**1.12 Wreckage and impact information**

The aircraft was found parked at the edge of the runway. The right propeller and the power section of the right engine had already been removed by the owner contrary to the requirements of Civil Aviation Act (Accident Investigation Regulation 5(1) which says that where an accident occurs in or over Tanzania of which notification is required to be given under regulation 3, no person other than an authorised person shall have access to the aircraft involved in the accident and the aircraft shall not, except under the authority of the Minister, be moved or otherwise interfered with.

There was no damage to the rest of the aircraft.

**1.12.1 The right propeller**

The right propeller was examined at the premises of the operator, Tanzanair, in Dar es Salaam. All the blades were slightly bent and the hub was damaged.

**1.12.2 The right engine**

The compressor section was examined at Ziwandu. It showed no signs of damage. The power section was examined at the Tanzanair hangar in Dar es Salaam. It was evident from physical examination that the casing which houses the power section suffered impact damage at three points. The turbine could not be rotated. Visual inspection showed that some of the blades had jammed against the deformed shroud.

**1.13 Medical and pathological information**

Not applicable.

**1.14 Fire**

There was no fire.

**1.15 Survival aspects**

This was survivable accident.

## **1.16 Tests and Research**

Not applicable.

## **1.17 Other information**

### **1.17.1 Aircraft accidents involving collision with animals on runways in Game Sanctuaries**

The presence of animals on runways represents serious hazard to aircraft movements. It is not unusual to find animals grazing or walking across runways of airstrips located in Game Reserves, National Parks and Conservation Areas. Animals are also to be found on many other airstrips. In the first three locations animals have right of way.

Aircraft visiting game airstrips are always advised to circle around the airstrip of intended landing so as to scare animals away from the runway and the surrounding areas.

For manned airstrips motor vehicles are sometimes used to drive away the beasts for aircraft to land. However, experience has shown that these have not been completely effective when there are bushes on the edges of the runways. Fencing runways in Game Parks has been tried with some measure of success. There have been problems with fencing as well:

- Some animals tended to sneak inside the fenced areas when gates were opened for vehicles to pass. It subsequently became very difficult to get them out.
- It was also realised that the fences became hiding places for beasts of prey which used the fences as natural barriers to corner their prey. Once animals were killed in the areas, the corpses attracted birds of prey which are a serious hazard to aviation.
- Some airstrips, notably those which are not manned, rely on animals to keep the grass short. Fencing the runways would render them unusable due to fast growing grass.
- Some elephants always destroyed the fences. When the fences were electrified, the elephants smashed these with logs of wood. The elephants were successfully stopped by digging trenches around the runways although these trenches become dangerous for aircraft running off the runway.

Recommendation 3.3.17 of the Standards and Recommended Practices of the ICAO Annex 14 (Aerodromes-ICAO Code No. 2) stipulates that:

That portion of a strip containing a non-instrument runway within a distance of at least 40 metres from the centre-line of the runway and its extended centre-line should be so prepared or constructed as to minimise hazards arising from differences in load bearing capacity to aeroplanes which the runway is intended to serve in the event of an aeroplane running off the runway.

In the last two years there has been four accidents in which aircraft have collided with animals on runways. Two of the accidents occurred at Ziwandu and one aircraft was written off when it collided with a giraffe.

## 2. ANALYSIS

It is evident from the examination of the aircraft, the damaged parts, accident photographs and eye witness statements that the aircraft collided with an animal.

There were no animals on the runway at the time of the attempted landing. This was stated by the pilot and was confirmed by eye witnesses on the ground who were waiting for the aircraft. The three impalas appeared on the runway when the aircraft was rolling at high speed during the landing roll. The animals could not be seen by the pilot in time due to the presence of bushes on either side of the runway.

In accordance with the Standards and Recommended Practices of the ICAO Annex 14 (Aerodromes) the area covering 40 metres on either side of the runway centre-line and extended centre-line must be clear of any obstructions.

Had this been the case with the Ziwandu runway, the pilot should have been able to see the animals in time to take evasive action.

## 3. CONCLUSIONS

### (a) Findings:

- (i) The pilot was properly licensed to undertake the flight.
- (ii) The aircraft was well maintained and its documents were in order.
- (iii) The aircraft collided with an impala during the landing roll at Ziwandu

airstrip.

- (iv) The operator tampered with the wreckage by removing parts of the aircraft before inspectors arrived at the scene of the accident.

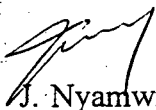
**(b) Cause:**

It was established that the aircraft collided with an impala during the landing roll. It was, however, not possible to establish whether there was more information leading to the causes of the accident due to the operator's action of tampering with the wreckage prior to the arrival of inspectors at the accident site.

**4. SAFETY RECOMMENDATIONS**

It is recommended that:

- 4.1 The runway shall have maintained strip around it in accordance with ICAO Code No. 2 runway classification requirements; that is 40 metres from either side of the runway centre-line and from the thresholds.
- 4.2 Manned airstrips in National Parks should have their runways fenced.
- 4.3 Operator's should refrain from interfering with accident aircraft before the arrival of inspectors.



**J. Nyamwihura**  
**INSPECTOR OF ACCIDENTS**

Accident Investigation Branch  
Ministry of Communications and Transport